URBAN AGRICULTURE MAGAZINE
www.ruaf.org
VOLUME 1, NUMBER 1, JUNE 2000

Welcome to this first issue of the Urban Agricultural Magazine

Growing cities and urbam populations are one of the big challenges of the future. The importance of urban agriculture in sustainable urban development is growing. As recognition grows, more people are becoming involved with the issue. Many newsletters and magazines have devoted editions to the subject in recent years including GATE, Urban Age, African Urban Quarterly, and the LEISA Newsletter and there have been many workshops and conferences on the subject.

Editorial

In 1996 a group of international institutions - the Support Group on Urban Agriculture (SGUA) - gathered in Ottawa to discuss the potentials and risks associated with urban agriculture. They also discussed strategies that could be used to overcome the principal constraints to sustainable food production in and around the cities of the South.

This group of experts concluded that a major bottlenecks was lack of communication on urban agriculture among actual and future practitioners whether researchers, city farmers, urban planners, consumer organisations, city administrators, national and international support organisations, and other stakeholders. The RUAF Programme (Resource Centre on Urban Agriculture and Forestry) was developed to fill this gap.

The publication of the Urban Agriculture Magazine (*UA-Magazine*) is one of the ways the RUAF Programme intends to facilitate the flow of information and discussion on the actual and potential roles of intra-urban and peri-urban agriculture. The RUAF web-site, which soon will be released, will be the main medium in this process. The site will provide additional information including reviews of recent publications, a guide with information on institutes and resource-persons and institutions on urban agriculture, and a (interactive) bibliographic database. There will also be news and networking. Some of this information is also included in this hard-copy version of the *UA-Magazine*.

The UA-Magazine will be published three times a year on the website

THE URBAN AGRICULTURE MAGAZINE

We have discussed many formats for the *UA-Magazine*. We have been trying to find a balance between a fully electronic magazine and the "hardcopy" version, something that would meet the needs of all our readers and contributors. What you have before you is a magazine format that is still

The Urban Agriculture Magazine
RUAF, P.O. Box 64
3830 AB Leusden, The Netherlands
ruaf@etcnl.nl

in an experimental stage.
The *UA-Magazine* will be published three times a year on the RUAF-website. Subsequently it will be published and distributed in hard copy.

The *UA-Magazine* will act as a platform for the exchange and discussion of quality information on urban agriculture including research results, project experiences, critical analysis of conventional and innovative policies on urban agriculture. We hope that the *UA-Magazine* will stimulate and facilitate an interdisciplinary debate. Urban agriculture is a typical cross sectoral phenomenon and joint reflection and active co-operation between various disciplines – including planners, health specialists, water management experts, agriculturists and environmental specialists - is essential. At the same time the *UA-Magazine* is not just another journal for experts. All types of stakeholders are needed to build, examine and consolidate the growing body of knowledge on urban agriculture. The experiences presented should reflect the viewpoints of all city farmers, men or women, consumers, local authorities, local private enterprises, and other service organisations. Development of sustainable urban food systems requires the active involvement and support of various actors - the general public, local neighbourhood groups as well as urban food producers and consumers.

The *UA-Magazine* will facilitate the sharing of information on the impact of urban agriculture and promote analysis and debate on critical issues for the development of the sector. We welcome contributions on new initiatives at individual, family or enterprise, neighbourhood, city and national levels. We want to publish the "best" or "good" or even 'bad" practices in urban agriculture.

We will give attention to the technological aspects - appropriate cultivation technologies for urban conditions, for example - as well as to social and economic aspects of urban food production and distribution systems such as gender aspects, distributional aspects, consumer-producer linkages. Special attention will be given to the integration of urban agriculture into city development and land use planning and the development of more adequate and operational local standards and regulations for urban agriculture.

All issues of the *UA-Magazine* will focus on a selected theme, which will be prepared and edited in collaboration with a guest editor who is a specialist in that theme. The next issue will focus on Urban Livestock, and is planned for October 2000. This issue has been planned for some time. Urban Livestock is an often neglected issue, because attention tends to focus on vegetable production in the cities.

FORTHCOMING ISSUE
During two workshops, in Quito and Hanoi (see page 34/35), a survey was carried out on the issues respondents

Urban Agriculture and Biodiversity
Bringing back agriculture, forestry, aquaculture and livestock rearing to the human settlement is a key component to reduce the ecological footprint of cities. This statement is defended and illustrated in this article with different examples.

PAGE 11

PAGE 8

Urban Food Security;
urban agriculture response to crisis
This article is based on information extracted from 20 city case studies on urban agriculture world-wide and additionally draws from experiences of the Urban Vegetable Promotion Project in Dar Es Salaam (Tanzania). It is argued that local authorities have to take their responsibilities in securing urban food security.

The Support Group on Urban Agriculture (SGUA)

The Support Group on Urban Agriculture (SGUA) dates back to 1991 when UNDP established the Urban Agriculture Advisory Committee, which in the next year resulted in the establishment of the Support Group on Urban Agriculture (SGUA). This Group has been looking into the identification of key research and development needs in urban agriculture and how to co-ordinate and pool support of SGUA-participants. In this past decade, the number of international support organisations involved in Urban Agriculture has rapidly grown, which is reflected in the growing number of organisations participating in the SGUA (actually over thirty international organisations participate).

The SGUA aims to stimulate and facilitate activities regarding urban agriculture by national and local governments, NGOs, and agencies for international and bilateral development co-operation, and the direct involvement of local stake holders (associations of urban farmers, neighbourhood organisations, small entrepreneurs active in recycling of organic wastes, etc.) in the planning and implementation of such activities.

The SGUA is guided by a Steering Committee in which at present participate representatives of IDRC (secretariat), UNDP, FAO, DGIS, CIRAD, ETC and TUAN. Members of the SGUA meet at least bi-annually since 1992, hosted by one of its members: In 1999 SGUA members met in Havana, Cuba, hosted by DSE, taking

wanted to address in a Magazine on urban agriculture.
The respondents were requested to give their opinion on important issues in urban agriculture that should be tackled in forthcoming issues on the *UA-Magazine*, both in an open question, and by giving a score (1-5) to a list of given issues. They were further asked how they preferred to receive the Magazine. On the latter question, half of the respondents indicated that they preferred the internet, while the other half would like to receive a hard-copy or a diskette. According to the open questions, the next issues of the *UA-Magazine* should deal with Technologies; Policy Development; Methodology (in assessment, planning and implementation); and Impact Monitoring. The rankings of the given subjects, showed that a focus on Methodologies; Health; Waste Management; Marketing; Planning; and Methodology Development, would be preferred.

Based on the results of these surveys, and considering that the forthcoming electronic conference, organised by FAO and ETC (see page 33), will supply us with a lot of potential contributions, the following planning for the next six issues is made:
No. 3 ***Integration of urban agriculture in urban planning*** (January 2001)
No. 4 ***Management of urban agriculture related health aspects*** (April 2001)
No. 5 ***Methodologies in planning and facilitation of urban agriculture*** (September 2001)
No. 6 ***Urban agriculture and food security*** (December 2001)

A questionnaire similar to the one used in the two workshops mentioned above has been included in this issue. We would be grateful if you would fill it in and return it to the editors so we can take account of your suggestions and comments.

In the near future RUAF will also produce regional hard copy versions of the *UA-Magazine* in local languages, in close co-operation with regional institutions and networks. This year we will only distribute an English version to members of the SGUA and readers that do not have access to the Internet or will use the hard copy version for local promotional activities.

THIS ISSUE
For this first issue, we decided to present a range of topics on urban agriculture, rather than a thematic selection, in order to give the readers an idea of the array of subjects that could be dealt with in the UA-Magazine in future. The collection of articles sought and received (no call was done for this issue), do show a certain thematic focus: various articles deal, explicitly or sideways, with urban agriculture as a response to crisis and as a mechanism applied by disadvantaged families to secure their livelihood under adverse conditions. Economic crisis, and related problems of unemployment, lowering cash incomes and

advantage of their participation in the international workshop 'Growing Cities Growing Food'. The next meeting is foreseen in July 2000 in Berlin.

The main functions included in the Global Initiative of the SGUA are the following:
❖ *Policy development;* SGUA-members actively support awareness creation among local authorities regarding the potentials of urban agriculture, seeking the integration of urban agriculture in city development. *Research;* SGUA stimulates innovative research on urban agriculture, with an emphasis to removing roadblocks for the integration of urban agriculture in policies and planning at national and local levels.
❖ *Technical assistance:* SGUA encourages and facilitates that technical assistance is made available to target group organisations and support organisations active in the field of Urban Agriculture, with an emphasis on South - South co-operation.
❖ *Investment and credit:* SGUA encourages private investment in urban and peri urban dairy and small livestock, vegetables and poultry production, the production and distribution of agricultural inputs, and other urban agriculture related small and micro enterprises.
❖ *Information and Communications;* were identified as one of the main functions of the Global Facility. SGUA members jointly formulated the RUAF Programme in order to facilitate communication on urban agriculture and to enhance documentation and exchange dissemination of experiences.

More information on the SGUA, its members and their activities can be encountered on the IDRC website http://www.idrc.ca/cfp/sguaf_e.html
Contact Luc Mougeot (PhD), Co-ordinator Cities Feeding People Programme IDRC, telephone: 613 236 6163, #2310 fax: 613 567-7749 - LMougeot@idrc.ca - www.idrc.ca/cfp

Ahmedabad Green Partnership Project

To make an urban forestry programme a success, the project partners need to keep a constant dialogue and a long-term commitment to make it happen. This is illustrated by the Ahmedabad Green Partnership Project, an effort between the Ahmedabad Municipal Corporation (AMC) and the Private Sector in Ahmedabad, India.

PAGE 21

In this issue

RUAF is a global initiative of the Support Group on Urban Agriculture, co-ordinated by ETC

relative high food prices, is certainly one of the factors inducing rapid growth of urban agriculture. However, a crisis is not the only driving factor. There are numerous cities where urban agriculture has developed where there has been no experience of crises or where the crisis –for certain categories of the population- is an intrinsic part of the urban system.
All the articles show that urban agriculture is extremely heterogeneous, in size, extent and management levels. Urban agriculture may be a matter of survival, positively affect biodiversity, increase food security, improve waste-recycling, but may also impose additional problems. They also call for a need for systematic analysis of cases and the impact of urban agriculture, the exchange of information and development of policies.

We hope you appreciate this UA-Magazine

Two articles (Mougeot and Gündel, de Zeeuw and Waibel) are reworked articles taken up in the Reader: Growing Cities, Growing Food (Bakker et al. 2000). The full text of these presentations can also be found on the RUAF website, while hard copies are available from DSE, Germany.

We hope you appreciate this *UA-Magazine* and that you make yourself known to us, so that we start to know who our readers are.

PAGE 19

Dynamics in Tropical Homegardens

The importance of home gardens, the small areas of cultivated land immediately surrounding a home or a homestead, is often underestimated despite its vital contribution to meeting various household-needs, especially for poor families in developing countries. In this article, the impact of homegardens in the Philippines is explored.

Resource centre on Urban Agriculture and Forestry (RUAF)

The aim of RUAF is to facilitate integration of Urban Agriculture in the policies and plans of city authorities and to facilitate the formulation of projects on urban agriculture with active involvement of all local stakeholders. The duration of RUAF is five years, which started in October 1999. A midterm review will take place in the third year of the Programme.

OBJECTIVES

The general aim of RUAF is to facilitate integration of Urban Agriculture in the policies and plans of city authorities and to facilitate the formulation of projects on urban agriculture with active involvement of all local stakeholders (like urban planners, groups of urban farmers, consumer organisations, technical and credit organisations, environmental groups, health authorities, related local small enterprises, and others).
The information pro-actively disseminated by RUAF is also intended to influence agricultural research and extension organisations to include urban agriculture and to provide more support to urban farmers.
The specific objectives of the RUAF-Programme focus on: awareness raising; identification and analysis of critical issues; improving access to documented experiences; supporting local capacity development and networking; secure embedding of RUAF activities in international organisations
Next to the Newsletter, RUAF outputs are: one electronic conference on a selected key theme per year; a bibliography on Urban Agriculture accessible by Internet and on diskettes; a resource directory; a "Reader" on Urban Agriculture and a homepage. Furthermore, it is envisaged that six Regional Focal Points are in operation.

ORGANISATIONS

The RUAF-Programme will be administered by IDRC (in the "Cities Feeding People Programme"). The leading implementing organisation will be ETC-International, based in Leusden, The Netherlands, who will co-ordinate the activities of six regional focal points, TUAN, City Farmer Network and other organisations participating in the Programme.
RUAF will maintain close working relations with the IDRC's Cities Feeding People Programme (CFP), FAO's Food for Cities Programme (FFC) with the UNDP-UNCHS Urban Management Programme (UMP), WHO's Healthy Cities Programme, The Local Environment Initiatives Agenda 21 (ICLEI), the CGIAR Strategic Initiative on Urban and peri-urban Agriculture (SIUPA) and other relevant international programmes.
RUAF will also closely co-operate with existing and new regional networks on urban agriculture. An important aim of the RUAF Programme is to have RUAF services integrated in regular programmes of organisations and networks.

RUAF receives financial support of DGIS (the Netherlands) and IDRC (Canada). Other institutions have contributed to specific components of the programme like CTA (database on resource persons), GTZ (city case studies / Reader), DSE (regional workshop, publication of the Reader) and SIDA (annotated bibliography).

For more information, visit the RUAF Web-site: http://www.RUAF.org
Or contact Ir. Henk de Zeeuw, co-ordinator RUAF, Visiting address:
ETC, Kastanjelaan 5, 3830 AB Leusden, the Netherlands
E-mail: ruaf@etcnl.nl Phone: +31-33-4943086 Fax: +31-33-4940791

Urban Agriculture
in Lomé, Togo

Urban Agriculture: Concept and definition

Key features of current definitions of 'urban agriculture' generally have downplayed a critical trait that makes urban agriculture to be urban. Urban agriculture is different from, and complementary to, rural agriculture in local food systems: urban agriculture is integrated into the urban economic and ecological system. Unless this dimension is enhanced and made operational, the concept will remain little useful on the scientific, technology and policy fronts.

On the ground, urban agriculture is growing out of its ability to assist with, resolving or coping with diverse development challenges. It is spurred by a complex web of factors still little understood, not the least of which are urban poverty and food insecurity. A common agreed concept is necessary, because policy and technology interventions need first and foremost to identify meaningful differences and gradations, if they are to better assess and intervene with appropriate means for promotion and/or management of urban agriculture.

CONCEPT DEVELOPMENT

Concepts are mental tools that we forge – and eventually rework – to better understand, interact with and modify our real-world experience. They are historically and culturally bound, relevant in some places and less so in others, fitting today but perhaps less so tomorrow. The urban agriculture concept needs to evolve out of our need to codify and refine our perceptual experience with a rather new world phenomenon, so as to ensure that it remains or becomes more useful to us where we will need it. Its identity depends on this external functionality as much as on its internal coherence.

The expression Urban Agriculture, or "Intra- and Peri-Urban Agriculture", originally used only by scholars and occasionally in the media, has now been adopted widely (Smit et al. 1996b, FAO, 1996; COAG/FAO 1999). This makes the need to further define and specify the concept important. Only with greater internal coherence and external functionality will it turn into a distinctive and useful tool for us to understand and intervene.

By *internal coherence*, we should ask, whether urban agriculture really is what we call, or want to call, what we perceive to be out there. The overarching definition should lead us into a full conceptual system or edifice, a structure of interconnecting compartments anchored into real-world experience.

With *external functionality* the position of urban agriculture in relation to other concepts, for instance rural agriculture, sustainable urban development or urban food supply systems is needed. The concept should be clear enough, that users can easily perceive its potential for complementarity and synergy with related concepts.

CURRENT DEFINITIONS

The more common definitions of urban agriculture are based on the following determinants (see figure 1):

- types of ***economic activities***;
- food/non-food categories of ***products*** and subcategories;
- intra-urban and peri-urban character of ***location***;

Figure 1: Urban Agriculture: Common Dimensions

Luc J.A. Mougeot
International Development Research Centre (IDRC), Cities Feeding People Programme, Ottawa, Canada

- types of *areas* where it is practised;
- types of production *systems*;
- product *destination* and production scale.

Economic Activities
Most definitions refer to the production phase of agriculture, while recent definitions add processing and trade to production and emphasise the interactions between these. In urban agriculture, production and marketing (and also processing) tend to be more interrelated in time and space, thanks to greater geographic proximity and quicker resource flow. Economies of agglomeration seem to prevail over those of scale.

Categories of Products
The definitions here may highlight food production for consumption by either people or livestock. Further, a difference between type of crop (grain, root, vegetable, aromatic and medicinal herbs, ornamental plants, tree and fruit crops) and types of animals (poultry, rabbits, goats, sheep, cattle, pigs, guinea pigs, fish, etcetera) is made. Within the food category, definitions clearly stress the more perishable and relatively high-valued vegetables and animal products and by-products. To exclude the non-food category from the general urban agriculture concept would truncate the understanding of city farming at large.

Exchanges are taking place across production systems and within particular production units. Many ways exist in which urban agriculture interacts with other urban functions to use and provide resources, outputs and services to the city.

Location
By far the most common element of the reviewed definitions is location, and probably the biggest source of contention. Few field studies actually differentiate between intra- and peri-urban locations, or if they do criteria used vary widely. Those who do differentiate have used as criteria for *intra-urban agriculture*: population sizes, density thresholds, official city limits (Gumbo & Ndiripo 1996), municipal boundaries of the city (Maxwell & Armar-Klemesu 1998), agricultural use of land zoned for other use (Mbiba 1994) or agriculture within the legal and regulatory purview of urban authorities (Aldington 1997).

For *peri-urban agriculture*, the location definition is more problematic. Peri-urban locations are in closer contact with rural areas and tend to undergo, over a given period of time, more dramatic agricultural changes than do locations in more central and built-up parts of the city. Authors have been trying to delineate the outer boundary of the peri-urban area, using for instance urban, sub-urban and peri-urban zones based on varying ratios of buildings and roads and increasing ratios of open space per km^2 (Losada et al. 1998). Others use the maximum distance away from city centre within which farms can supply perishables to the city on a daily basis (Moustier, 1998), or the area within which people living within the city's administrative boundaries can travel to engage in agricultural activities (Lourenço-Lindell, 1995).

Types of Areas
Criteria according to which such areas are typified vary from author to author: location respective to residence (on-plot or off-plot), development status of site (-built-up vs open-space), modality of tenure/usufruct of site (cession, lease, sharing, authorised through personal agreement or unauthorised, customary law or commercial transaction) and the official land-use category of the sector where urban agriculture is practised (residential, industrial, institutional, etc.).

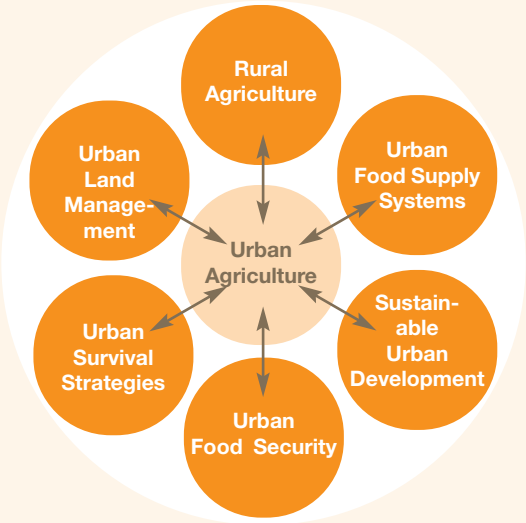


Figure 2: Urban Agriculture and other "Kids on the Block"

Product Destination
Most definitions embrace agricultural production for both self-consumption and some trade. Both destinations usually are targeted to varying degrees by the producers or households studied. Economic research recently has been aimed at specific (export) market-oriented production and has helped us to better understand the economic performance of urban agriculture and its comparative advantages over other supply sources, both at the producer and consumer level.

The most common element is location

Production System and Scale of production
Few definitions clearly include or exclude specific types of production systems *a priori*. Surveys collect data on the different types of systems found in the area under study (see other section for details). Generally, the research effort has focused on individual/family micro, small and medium sized enterprises, as opposed to large scale, national or transnational undertakings.

The urban ecosystem connection
While referring to these dimensions of

REFERENCES
- Aldington T. 1997. Urban and peri-urban agriculture: some thoughts on the issue. Land Reform, Land Settlement and Co-operatives 2: 43-44.
- COAG/FAO (Committee on Agriculture, Food and Agriculture Organisation of the United Nations). 1999. Urban and peri-urban agriculture. COAG/99/10. Presented at 15th Session of the COAG, FAO, Rome, 25-29 Janurban agriculturery 1999.
- FAO. 1996. Urban agriculture: an oximoron? In: The state of food and agriculture 1996 (Rome: FAO), pp 43-57.
- Gumbo DJ & Ndiripo TW. 1996. Open space cultivation in Zimbabwe: case study of Greater Harare, Zimbabwe. African Urban Qurban agriculturerterly 11 (2-3): 210-216.
- Lee-Smith D. 1998. African urban policy: issues and priority. Paper presented at International Conference on Urban agriculturePolicy in Southern Africa, Technikon, Pretoria, 3-5 March 1998.
- Losada H, Martinez H, Vieyra J, Pealing R & Cortés J. 1998. Urban agriculturein the metropolitan zone of Mexico: changes over time in urban, sub-urban and peri-urban areas. Environment and Urbanization 10 (2): 37-54.
- Lourenço-Lindell I. 1995. Food for the poor, food for the city: the role of urban agriculturein Bissau. Paper presented at ODA Workshop on The Social and Environmental Implications of Urban Agriculture, University of Zimbabwe, Harare, 30-31 August 1995.
- Maxwell D & Armar-Klemesu M. 1998. Urban agriculture: introduction and review of literature. Accra: Noguchi Memorial Institute for Medical Research.
- Mbiba B. 1994. Institutional responses to uncontrolled urban cultivation in Harare: prohibitive or accommodative? Environment and Urbanization 6 (1): 188-202.
- Mbiba B. 1998. Urban agriculturepolicy in Southern Africa: from theory to practice. In: Productive open space management with a shared focus on the potential of urban agriculture(urban food production) policy and Agenda 21. Draft papers for an International Conference, Pretoria, 3-5 March 1998.
- Mougeot LJA. 1999. For self-reliant cities: urban food production in a globalizing South. In: Koc M, MacRae R, Mougeot LJA & Welsh J (eds), For hunger-proof cities: sustainable urban food systems (Ottawa: IDRC), pp 11-25.
- Moustier P. 1998. La complémentarité entre agriculture urbaine et agriculture rurale. In: Olanrewaju B Smith (ed.), Agriculture urbaine en Afrique de l'Ouest: une contribution à la sécurité alimentaire et à l'assainissement des villes (Wageningen: CTA / Ottawa: IDRC).
- Moustier P (ed.). 1999. Filières maraîchères à Brazzaville: qurban agriculturentification et observatoire pour l'action. Montpellier: CIRAD - Agrisud International - Agricongo.
- Smit J, Ratta A & Nasr J. 1996b. Urban agriculture: food, jobs and sustainable cities. Publication Series for Habitat II, Vol. I. New York: United Nations Development Programme (UNDP).
- Yi-Zhang Cai 1999. Case study: urban agriculture in Shanghai. GATE Technology and Development 2 (April-June): 18-19.

urban agriculture, most authors define it only in general terms. Studies rarely use their findings to refine the urban agriculture concept of the day (Mbiba 1998) or to analyse how this concept is related to other development concepts (see Figure 2).

One striking feature of the reviewed definitions is that few of them contrast urban and rural agriculture, even less so the implications of one for the other. Indeed, all building blocks, perhaps except location, can apply to rural agriculture as well; they do not suffice to trademark urban agriculture and justify the need for specific knowledge, know-how and policy.

The lead feature of urban agriculture, which distinguishes it from rural agriculture, is *its integration into the urban economic and ecological system* (hereafter referred to as "ecosystem").

It is not its urban location, which distinguishes urban from rural agriculture, but the fact that it is embedded in and interacting with the urban ecosystem. This integration into the urban ecosystem is not captured in most definitions of the concept, and less so developed in operational terms. Though the nature of cities and of urban food supply systems has changed, the need for urban agriculture to interact well with the rest of city, on one hand, and with rural production and imports, on the other, remains as true today as it was thousands of years ago.

The principle of agriculture's integration into the urban ecosystem enables to recognise three types of situations, or relationships, with regard to the degree to which agriculture found in the city is actually integrated into the city organism (figure 3).

A first relationship is that, in any given city, at any given time, agriculture will be found that is rural, peri-urban, and intra-urban in nature, the three interacting and complementing each other to varying extents.

Several studies exemplify the principle of integration through comparisons between intra-urban, peri-urban and rural activities. Urban agriculture is found to complement rural agriculture in terms of self-provisioning, marketing flows and market-supply flows, as shown for instance by CIRAD studies on vegetable and livestock production in West and Central Africa (Moustier et al., 1999).

A second relation is that across cities of different size or complexity, at any given time, more of the agriculture found in the city will be of an urban nature in larger as opposed to smaller centres. Systematic evidence for this relationship however, remains more limited than for the first. A six-city Kenyan study further shows that intensity and productivity increases with city size; similarly, the use of organic inputs and of networks of exchange or trade increases with city size (Lee-Smith 1998).

Figure 3: Three types of relationships

The third relation is that in any given city and over a period of time, during urbanisation, agriculture of an urban nature will grow as a percentage of all the agriculture found in that city. Some evidence is available on multiple-year trends for specific systems and areas of Dar es Salaam, Dakar, Hong Kong and Cagayan de Oro, where land-based farming systems have intensified or specialised, and marginal agricultural activities have been substituted by more profitable ones, increasingly combined with non-agricultural land uses, when not relocated. Shanghai exemplifies several of these processes at work, with land-extensive systems (vegetables and livestock) moving to the outskirts, while production within city limits is becoming more efficient to deliver higher yields and labour productivity and value-adding (Yi-Zhang Cai, 1999).

In all three relationships, agriculture will become more urban, or will integrate itself more into the urban ecosystem, through a series of processes, which accumulate over time and are more numerous in the larger urban centres.

CONCLUSIONS

The urban ecosystem link of urban agriculture throughout its entire conceptual framework remains to be fully developed. Its conceptualisation currently offers a generic definition and some indications of its distinctive traits. A de-codification of this definition is needed to help to identify its distinctiveness, in both theoretical and operational terms. Efforts in that direction have already begun and are forcing to distinguish between intra-urban and peri-urban agriculture, and to examine the place of urban agriculture within larger conceptual frameworks. Because urban agriculture is reported to interact with so many facets of urban development, city farming also holds the potential to help to diversify and strengthen urban management strategies. This is not a small opportunity, as city-based electorates struggling for access to food, income and sanitation are increasingly calling the shots in local and national policy arenas.

The above, is the background for the following revision of the concept: Urban agriculture is located within (intra-urban) or on the fringe (peri-urban) of a town, a city or a metropolis, and grows or raises, processes and distributes a diversity of food and non-food products, (re-)uses largely human and material resources, products and services found in and around that urban area, and in turn supplies human and material resources, products and services largely to that urban area.

Urban Food Security

Urban agriculture, a response to crisis?

Urbanisation is one of the major problems of mankind in the near future. By 2015 about 26 cities in the world are expected to have a population of 10 million or more (figure 1). To feed a city of this size today - for example Tokyo, São Paulo or Mexico City - at least 6000 tonnes of food must be imported each day (FAO-SOFA 1998). In 1988, about 25% of the developing world's absolute poor were living in urban areas, by 2000 about 56% of the absolute poor would be living in urban areas according to the World Resource Institute (WRI 1996) while, urban areas are expected to surpass rural areas in population around the year 2005 (FAO 1998).

There are significant regional differences in the degree of urbanisation. In the past Africa was a predominantly rural continent. However, in the present the cities in Sub-Saharan Africa are growing with an exceptional rate of 5% or more annually, by the year 2020 half of the population in this region will be urban (WRI 1999).

The capacity of governments to manage this urban growth is threatened in many developing countries, or already on the decline. The identification of ways to provide food, shelter and basic services to the city residents and create "sustainable cities" are challenges for many city authorities around the world.

Urban food security depends on various factors:

- Availability of food (which depends on food production in the rural and urban sectors, food imports, marketing and distribution, infrastructure, availability of fuel energy, etc.)
- Access to food (depending on purchasing power of urban households, subsistence production, rural-urban linkages, household networks etc.)
- Quality of food (depending on preservation of street food, quality of production, abuse of pesticides, use of waste water for production, sanitary conditions on markets, air quality etc.).

URBAN AGRICULTURE

The phenomenon that a growing number of urban dwellers are engaging in agricultural activities, especially in the less developed countries has been witnessed all over the world. We will further mention "urban" areas here, referring to both, intra-urban and peri-urban areas (*the Editor: for definitions see the article by Mougeot in this Magazine).*

It is estimated that 800 million people are engaged in urban agriculture world-wide and play an important role in feeding the world's cities (UNDP 1996, FAO 1999). Urban agriculture is emerging strongly in Sub-Saharan Africa, where the fastest urban growth will occur in countries least equipped to feed their cities (Ratta & Nasr, 1996 in Mougeot 1999).

The objective of this paper is to discuss why people get involved in Urban Agriculture (UA). Food production in the city is in many cases a response of urban poor to:

- inadequate, unreliable and irregular access to food supplies, partly due to either a lack of availability or a lack of purchasing power [1]
- inadequate access to formal employment opportunities, due to deteriorating national economies in developing countries

Economic or food crises are certainly not the only driving factor behind the upsurge of UA. There are numerous cities where urban agriculture has developed without having experienced a special crisis period (or where the crisis – for certain categories of the population- is an intrinsic part of the urban system).

URBAN AGRICULTURE AS INTRINSIC PART OF A CITY

Agriculture, in general and the food production for the urban population was, and still is, thought to take place in the rural sector only. In reality this undertaking has failed in many coun-

Fig. 1: The development of mega cities since 1950 (after FAO-SOFA 1998)

A.W. Drescher - *University of Freiburg, Germany,* **P. Jacobi and J. Amend** *German Development Co-operation (GTZ) and Ministry of Agriculture, Dar Es Salaam, Tanzania*

Maize is cultivated at many open spaces in Harare, Zimbabwe

This article is partly based on information extracted from 20 city case studies on urban agriculture world-wide and additionally draws from experiences of the Urban Vegetable Promotion Project[2] in Dar Es Salaam (Tanzania). Most of the case studies were commissioned by the German Development Co-operation (GTZ) in 1998/1999 and presented at the International Workshop in Havana, Cuba in October 1999 (Bakker et al, 2000) Additional literature and own experiences of the authors in urban agriculture will complement the information.

tries due to missing infrastructure (delivery of seeds and fertilisers to rural areas and delivery of the harvested produce to urban centres) and lack of purchasing power of the urban poor. Although the interest in agriculture in urban centres is quite recent, it is practised for a long time.

Evidence suggests that urban agriculture complements rural agriculture and increases the efficiency of the national food supply in that it (IDRC 1998):

- provides products that rural agriculture cannot supply as well, e.g. perishable products, export crops that require rapid delivery upon harvest;
- can substitute for food imports intended for urban consumption, and thus save on foreign exchange;
- can release good rural agricultural land for export-oriented production; and
- can reduce pressure to cultivate new rural land, relieving stresses on marginal rural lands.

Additionally urban food production:

- can contribute to the generation of income in the rural sector by various and multiple interactions between the areas and its inhabitants (Drescher & Iaquinta 1999).

Urban people are not passive food recipients; in many cities they are actively involved in food production (Drescher & Iaquinta 1999).

URBAN AGRICULTURE AS A RESPONSE TO CRISES

Urban agriculture refers not only to food crops and fruit trees grown in cities but encompasses animals, poultry, bees, rabbits, snakes, guinea pigs and other indigenous animals. Urban fish production is also part of the food system in many tropical cities (Drescher & Iaquinta 1999). The urban farming system is a composition of many different activities like gardening, staple food production, gathering, hunting, and even urban forestry often combined with food production (figure 2, p.10).

The locus of poverty is shifting to urban areas (Haddad, Ruel, & Garrett. 1998). Economic crisis and structural adjustment policies introduced in developing countries have had a disproportionate impact on the urban poor, especially women, and have resulted in rising food prices, declining real wages, redundancy in the formal labour market, cuts in food subsidies for urban consumers. and further reduced public expenditure on basic services and infrastructure. It is often overlooked, that economic crisis has different impacts on women and men (see e.g. Drescher & Iaquinta 1999, Foeken & Mwangi 1999, Hasna 1998, Mbiba 1999 and others).

The short- and medium-term results of conditionally programs have put an economic squeeze on poor populations in developing countries, narrowing of the income gap between rural and urban dwellers, and resulting in accelerated migration from rural to urban areas (Nugent 1997). These urban poor frequently resort to the non-market (informal sector) activities for survival, like urban food production (Drescher & Iaquinta 1999).

Under such circumstances, urban food production can be defined as a "crisis induced strategy", ensuring survival of the poorer segment of the population. The following examples of people's survival strategies during periods of economic decline and social unrest in densely populated cities support the "crisis model" view.

Jakarta is one example in recent history. The economic turmoil that first hit Indonesia in 1997 has left millions of people vulnerable to food insecurity, without enough money to buy sufficient food. First urban areas were dramatically affected. Alarming food related problems were reported (FAO 1999a). As a reaction to this people started to produce food on small plots and open spaces all over the city—even transformed former public parks into gardens and government bodies encouraged the people of Jakarta to grow their own food. Problems started in urban areas to spread to rural areas later caused by migration. In some rural communities the population has increased up to 30%, putting severe pressure on those areas (FAO 1999a).

Maidar (1996) reports an example from Mongolia. The recent "shock therapy" measures taken by the Government have created great hardship as prices for consumer goods rise while salaries remain unchanged. The prices for food, coal, wood, electricity, transportation, etc. are skyrocketing. In 1990/1991, 850 families grew vegetables in the city. In 1996 this number has increased over 20 times reaching 21,000. More and more families have begun to realise that urban agriculture might be a way to improve their standard of living.

Globally induced economic crisis, rapid population growth and rural to urban migration, deteriorating national economies or persisting economic difficulties

[1] Unreliable and irregular access can be caused by natural disasters (as the hurricanes Georges and Mitch in 1999, flooding or economic disasters (like recent strikes in Ecuador, causing lack of food provision for several days)

[2] The Urban Vegetable Promotion Project (UVPP) was launched 1993 as a bilateral project between the Ministry of Agriculture and Co-operatives (MAC) and the German Development Co-operation (GTZ). It is financed by the Ministry of Economic Co-operation (BMZ).

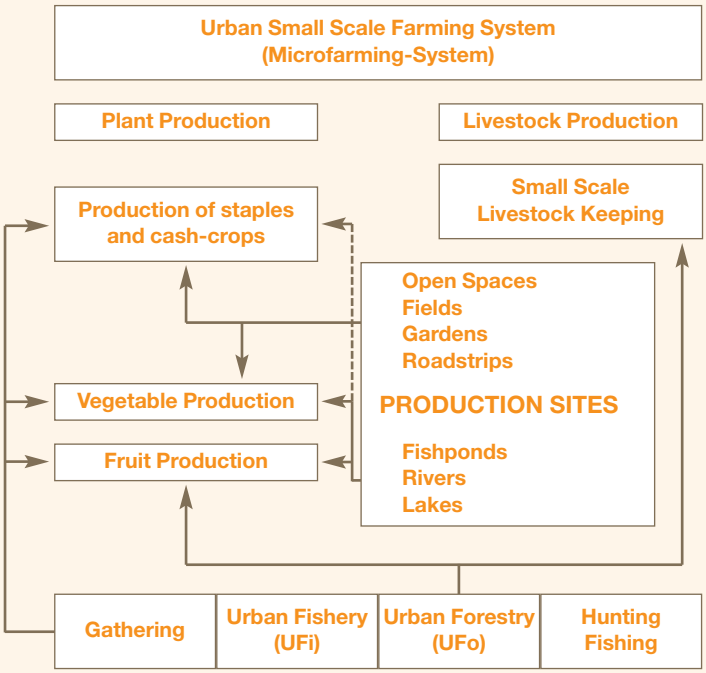


Figure 2: The wide range of urban agriculture within an interaction system (after Drescher 1998, modified)

are pre-conditions for urban food production in many developing countries and countries of transition. Nevertheless urban food production would by far have less importance if there would not be a shortage of adequate and accessible income opportunities and an unsatisfied demand for appropriate quantity and quality of agricultural products in cities.

Responsibilities have to be taken over by the appropriate authorities to ensure and to support food security in cities and have an impact on urban poverty alleviation.

CRITICAL ISSUES

A major problem in the acceptation of urban agriculture as a serious contributor to food security in the city and sustainable urban development. Another critical institutional constraint to urban agriculture, particularly crop cultivation, is access to land. This uncertain legal status of urban agriculture is such that official projects or programmes aimed at improving urban agriculture have been relatively rare. Typically urban agriculture is not taken into account in the urban planning process (Drescher & Iaquinta 1999).

Urban agricultural activities must be integrated into cross-sectoral and multi-stakeholder strategies for mutually beneficial urban and agricultural development (Mougeot 1996). Gender plays an important role. Women tend to dominate urban cultivation because they are marginalised in other forms of employment in the formal sector of the urban economy.
The term urban greening could assist in broadening the idea of urban agriculture. The new concept of "urban greening" (Kuchelmeister 1997), comprises the planning, and managing of trees, forests and related vegetation to create or add values to the local community in an urban area.

There is an increasing perception that rural and urban environments operate as a system („continuum") rather than independently. Therefore it is needed to bridge the rural-urban artificial detachment. In terms of migration and urbanisation, peri-urban environments play a mediating role between rural and urban (Iaquinta & Drescher 1999). This implies manifold rural- urban linkages:

Local urban governments are often relatively weak. Municipal councils which started off as colonial institutions were never fundamentally transformed to cater for a growing urban population especially in Africa (Unchs 1998). They however play an increasing important role in development activities. Little is actually known on the functioning of these local institutions. We presume that local institutions (formal or informal) like e.g. farmer groups, water users etc. have little influence on the decision making in the urban centres. Capacity building for local institutions and support for the formation of new, more efficient and interdisciplinary institutional approaches towards the urban-rural continuum are therefore needed. Greater collaboration between research and development capacities in urban planning and those in agricultural development is needed to make urban farming more efficient and sustainable (Mougeot 1996).

REMAINING QUESTIONS

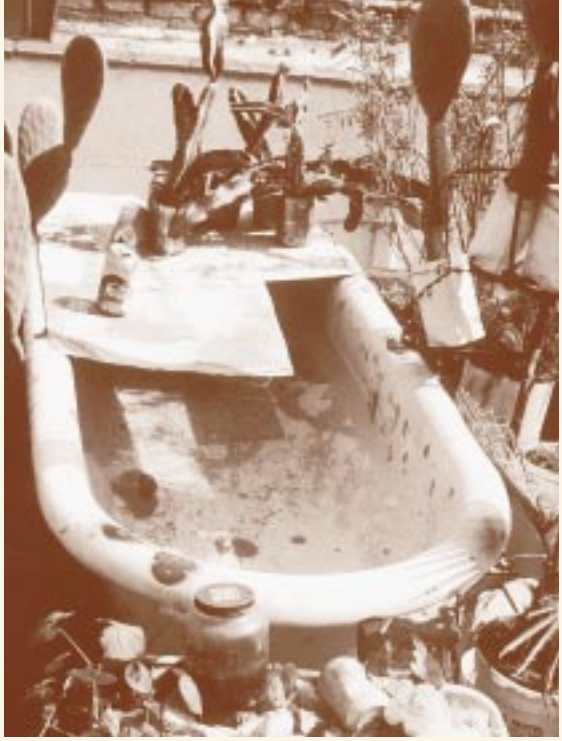
Open questions will remain for discussion and solution:

- How does urban agriculture develop, when the "crisis" is over?
- How can UA be integrated in urban planning ?
- How can UA institutionally and technically be linked to sustainable city programmes?

REFERENCES

- Bakker, N., M. Dubbeling, S. Gundel, U. Sabel-Koschella, H. de Zeeuw, (2000), Growing Cities, Growing Food, Urban Agriculture on the Policy Agenda, DSE, Germany.
- Drescher, A.W. & D. Iaquinta (1999): Urban and peri-urban Agriculture: A new challenge for the UN Food and Agriculture Organisation (FAO). FAO - Internal report. Rome.
- FAO (1998): Majority of people live in cities by 2005. Web Page Information FAO: http://www.fao.org/NEWS/FACTFILE/FF9811-E.HTM
- FAO-SOFA (1998): The State of Food and Agriculture. Food and Agriculture Organziation of the United Nations, FAO, Rome.
- FAO (1999):Issues in urban agriculture - Studies suggest that up to two-thirds of city and peri-urban households are involved in farming. Web Page Information FAO: http://www.fao.org/ag/magazine/9901sp2.htm
- Foeken, D. & A. Mboganie Mwangi (1999): Farming in the City of Nairobi. In: City Harvest - A Reader on Urban Agriculture, GTZ, Eschborn.
- Haddad, L., M. Ruel, & J. Garrett (1998): Growing urban poverty and undernutrition and some urban facts of life. International Food Policy Research Institute, Washington (forthcoming).
- Hasna , M. K. (1998): NGO Gender Capacity in Urban Agriculture: Case Studies from Harare (Zimbabwe), Kampala (Uganda) and Accra (Ghana). Cities Feeding People CFP Report Series, Report 21. IDRC, Ottawa.
- IDRC (1998): Other Organizations Active in Urban Agriculture. Web Page information: www.idrc.ca/cfp/other_e.html.
- Jacobi, P., A.W. Drescher & J. Amend (2000): Urban Agriculture, Justification and Planning Guidelines. UVPP, GTZ/MAC, Dar es Salaam.
- Kuchelmeister, G. (1997): Urban trees in arid landscapes: Multipurpose urban forestry for local needs in developing countries. In: The Arid Lands Newsletter (e-mail version), Fall/Winter 1997: Number 42.
- Maidar, Ts. (1996): City Farming in Mongolia. Urban Agriculture Notes. Published by City Farmer, Canada's Office of Urban Agriculture, www.cityfarmer.org.
- Mbiba, B. (1998): City Harvests: Urban Agriculture in Harare (Zimbabwe). In: City Harvest - a Reader on Urban Agriculture. GTZ, Eschborn.
- Mougeot, L. (1999): Urban agriculture: Definition, Presence, Potentials and Risks, and Policy Challenges. Paper presented to the International Workshop "Growing Cities, Growing Food", October 11-15 1999, La Habana, Cuba.
- Nugent, R.A. (1997): The Significance of Urban Agriculture. Published by City Farmer, Canada's Office of Urban Agriculture, www.cityfarmer.org.
- Ratta, A. & J. Nasr (1996): "Urban Agriculture and the African Urban Food Supply System," African Urban Quarterly 11/2-3.
- UNDP (1996): Urban Agriculture: Food, Jobs and Sustainable Cities. United Nations Development Program, Publication Series for Habitat II, Volume One. UNDP, New York.
- UNCHS (1998): Privatisations of municipal services in East Africa: A Governance Approach to Human Settlements Management. United Nations Centre for Human Settlements (Habitat) Nairobi, Kenya.
- WRI (1997): World Resources 1996-97: The Urban Environment. World Resource Institute, Washington DC.
- WRI (1999): World Resources 1998-99: The Urban Environment. World Resource Institute, Washington DC.

Several studies have found that modern cities, but also ancient ones, have a negative ecological footprint that is 50 to 125 times the area of the metropolis itself. Rees defines this ecological footprint as "the land area functionally required to support any given population. The resultant aggregate area can be called the relevant community's total 'ecological footprint' on the Earth." In addition, Girardet invented the term 'biocidic cities' – with which he labels "human settlements that take natural resources and give nothing back to mother earth". Folke et al., find that the pollution from cities on the Baltic sea diminishes the biosphere over 200 times the area of their collective built-up area. Future studies will tell us whether [a] the harvesting of resources to feed the city or [b] the poisoning of the ecology by the cities' waste streams are the more damaging.



Urban Agriculture and Biodiversity

Urbanisation and Diminishing Biodiversity

Jac Smit, *The Urban Agriculture Network (TUAN), USA*

In earlier geographic times, one spoke of the hinterland, the peri-urban and the sub-urban area as systems for the city. Today, New Yorkers eat Bengali shrimp daily, while Japan engorges Canadian and Malaysian forests. In a way, this is not so different in process than Athens mining the forests of Calabria (Magna Greacea), or Rome the wheat and soil of the North African coastal hills and plains. What is different is that today, with over six billion humans living on Earth and with half the population now urban (and increasingly more), it is on an entirely unprecedented scale that the global environment (and its biological diversity) is being diminished by urbanisation.

The urban footprint is an indicator more of the nature of the economy and of our lifestyle than of the number of urban residents. Estimates at the time of the Earth Summit (Rio) in 1992 found that 75 percent of the natural resources that we harvest and mine from the Earth are shipped, trucked, railroaded and flown to 2.5 percent of the Earth's surface, which is metropolitan. At that destination, 80 percent of those resources are converted into 'waste'. This linear process of resource to pollution reduces biodiversity.

There is an earth-wide commitment by national governments to reverse this linear process and mitigate its damaging consequences. Clearly no single solution can address this infinitely complex problem. One could argue that a key component to transforming this vicious process is to bring back agriculture, forestry, and livestock rearing to the human settlement, as was done in earlier civilisations. In the real world, such a trend may already be taking place, as the growing literature on urban agriculture and the rapid increase in its share of the food market, from Russia to Tanzania to Indonesia to the USA, is making clear.

The importance of urban agriculture as a response to crises is illustrated in numerous situations. But the hypothesis that urban agriculture has a role to play in sustainable development of modern cities is more difficult to address. This question has several subsets. As urban land, water, energy, money, and research systems are well established, how can urban agriculture as "community or civic agriculture" be integrated? If modern capital-intensive commodity agriculture is efficient, is there a role in the agri-food system for community-based, labour-intensive agriculture? Modern engineering, architecture and city planning have created cities that exclude agriculture: could urban agriculture be compatible with the modern city?

CITY FARMING'S DIRECT AND INDIRECT IMPACT ON BIODIVERSITY

A great variety in the types of ecological impacts are given in reports of agriculture in towns and cities. At the metropolitan scale, urban agriculture cleans the air and returns carbon to the soil. It restores microclimates, conserves urban water resources in some cases, but degrades them in others, and maintains a penetrable surface between air and land. And although livestock and poultry can contribute to disease and pollution, they are also powerful waste converters and soil enhancers. At the community scale, urban agriculture can either improve the "landscape for living" but it may also cause pollution and diminish human health.

Urban farmers are not inherently more environmentally conscious; they use the waste because they are farming on the 2.5 percent of the earth where the waste is. A TUAN (The Urban Agriculture Network) study for CARE International found that much of

what didn't get to the dump produced both food and green.

Agriculture in urban areas can mitigate negative impacts on surrounding and more distant biodiversity (the urban footprint). It is argued that urban agriculture is inherently more biodiversity-prone than modern rural agriculture, by being more sustainable, less chemically dependent and more biologically friendly. Urban agriculture occurs on smaller sites and typically has a more diverse/integrated crop mix. Urban agriculture closes open nutrient and energy loops. Perhaps the most effective example is modifying urban wetlands to food, fuel and recreation instead of filling them with waste and converting to built-up uses. Further research might be worthwhile on differences in biodiversity in different climate zones, associated with urban versus rural farming.

As urban agriculture grew in the Washington USA metropolis from 1978 to 1998, the variety of tomatoes available in the market increased from eight to seventy- four. Urban agriculture is the conservator and generator of biodiversity in agricultural crops from poultry to lettuce. One acre of urban agriculture, using urban waste as an input, can save five acres, or more, of rural marginal agricultural land or rain forest. Food production in our own back yards and city parks does not require genetically modified crops to be economically viable.

Urban agriculture produces food and energy crops close to the market demand, some within the neighbourhood. This proximity of production to consumption reduces traffic, storage, and packaging as sources of the pollution that erodes biodiversity. The average distance travelled for a food item on a supermarket shelf in New York was determined in 1995 to be 2,000 kilometres. In contrast, Rikers Island prison within New York City produces fresh food for the occupants, and for a catering service, within one kilometre of its consumption.

Urban agriculture is an effectice tool to slow down the loss of biodiversity

However, it is also possible to have a negative impact on the biodiversity of a city, by using poor urban agricultural practices. The *negative health* impacts of agriculture in cities played a major role in their substantial disappearance in 20th century Europe and North and South America. Today, as in earlier times, agriculture in the city poses a range of possible negative impacts. Irrigation with polluted water, animal waste in the streets, or praying chemical insecticides next door to a school of church can be injurious to man and the community biosphere. Converting park-like open space to mono-cropping can diminish biodiversity of the site (a vineyard is not a wilderness).

The management of a ecologically sustainable or 'biogenic' city, which conserves biodiversity, will require a much higher level of environmentally sophisticated management than current practices.

IMPACTS OF URBAN AGRICULTURE

Agriculture at *community* level is a good tool to self-management of resources, and the strive towards maximum or optimum biodiversity. With the rise of metropolis, a great deal of community responsibility has been handed over to the city and to large profit-making corporations.

The appropriate level of biodiversity management may well be the *bio-region* (watershed, island, coastal plain, or range of hills). Here rural and urban jurisdictions and interest groups will need to meet and negotiate to discover and assign the best role of urban agriculture. This may be done on a crop-by-crop basis, or at the farming system level, taking account of implications of the interaction between crops for biodiversity.

Taking the discussion a level higher, the appropriate role of urban agriculture in sub-Saharan Africa, may be quite different than for the Caribbean archipelago of small islands, where shipping costs and waste management are more critical. It may be desirable for a "low-income, food-deficit" country to concentrate on food production within urban areas in order to concentrate on foreign earnings from rural agriculture, and to conserve national natural resources for future generations.

POLICY CHANGES

The 1990s have witnessed a worldwide commitment to biodiversity. Beginning with the Environment Conference in Rio de Janeiro in 1992 and advancing through the work of the environmental NGOs, the green political parties, and some national governments, awareness of the threat of losing local and global biodiversity is becoming well established.

The 1996 USA Census of Agriculture reports that the number of farms, farmers and value of crop is increasing in both cities and the so-called sub-urban belts or metropolitan fringes. This is said to be a response to convenient markets and improved access to land and inputs, but is without national policy support. Similar data is emerging half a world away, in South Africa where national policy supports urban agriculture.

The alternative to the WTO scenario of liberalisation and international trade, may mean street trees on the main shopping street; vegetable production combined with chicken production in a small watershed; or a home garden containing 179 plant species (as an FAO study found in one sub-district in Java).

The essence of community ecological management is the principle of "closed nutrient loops". Urban waste management policy could benefit biodiversity by concentrating on closing open nutrient loops. This requires public and private organisations to maximise the re-use of waste within urban regions to ecological benefit. On the negative (control) side, there could be polices to reduce burning, use of chemicals, and long-distance hauling.

The Climate Change Convention urges member countries to "enhance carbon sequestration in forests and agricultural land". The International Centre for Local Environmental Initiatives (ICLEI) is currently recommending "carbon trading" by towns and cities.

There is some degree of consensus amongst international development organisations and national governments in favour of "sustainable agriculture", "sustainable urbanisation" and conserving a bio-diverse Earth. Urban agriculture is an effective tool to slow down the loss of biodiversity. Sustainable urban agriculture may be a smart policy option. To be sustainable throughout the 21st century, agriculture, our burgeoning urban human settlements and mother earth need city farmers.

Direct marketing from producer to consumer in Dar Es Salaam, Tanzania

The Integration of Agriculture in Urban Policies

Urban agriculture is seen as a dynamic concept that comprises a variety of farming systems, ranging from subsistence production and processing at household level to fully commercialised agriculture. Urban agriculture normally has a niche function in terms of time (transitory) and space (interstitial), as well as social (e.g. women and low income groups) and economic (e.g. financial crisis, food shortage) conditions.

Henk de Zeeuw, *ETC International, The Netherlands*
Sabine Gündel, *National Resources Institute, UK* **and Hermann Waibel**, *University of Hannover, Germany*

It has been observed that urban agriculture exists within heterogeneous resource utilisation situations. In terms of its contributions to development, urban agriculture enhances food security, provides additional income and employment for poor and middle-income urban dwellers, and contributes to an ecologically sound urban environment.
Thus urban agriculture can have different purposes, which are by no means mutually exclusive and co-exist in a range of different combinations. For instance, poor families might be engaged in urban agriculture for several reasons. Whereas the woman may emphasise the importance of urban agriculture for subsistence, her husband might stress the additional income generating benefits of it. Meanwhile, urban planners may evaluate these activities on the basis of their contribution to urban greening and microclimate development or to the reuse of urban organic wastes.

The diversity of urban agriculture is one of the main attributes, which contributes to its importance within a wide range of urban situations and for a diverse range of stakeholders.

OUTLINE OF A POLICY FRAMEWORK FOR URBAN AGRICULTURE

The fore mentioned variety of conditions, characteristics and purposes of urban agriculture, indicates the importance of a careful analysis of the specific context, and carefully designed interventions and policy measures for urban agriculture. Interventions must be linked with specific development objectives, to which urban agriculture is expected to make a significant contribution, and be based on participatory and multi-stakeholder diagnosis and planning processes.

This article is a shortened version of the article published in Bakker et al., 2000. It presents the policy options for facilitating and regulating the development of urban agriculture in Third World cities, as identified by the participants of the International Workshop on Urban Agriculture "Growing Cities, Growing Food – Urban Agriculture on the Policy Agenda", Havana, Cuba, October 1999.

In this section a range of potential policy options will be presented, which were identified by the participants as (potential) suitable policy responses to urban agriculture. It is clear that such recommendations are of a general nature and will have to be refined according to specific local conditions. The policy options are described in relation to the integration of urban agriculture in the following urban policy areas: land use policy; food security; health policy; environmental policy, and social development policy.

Land Use Policy

Access to land and water resources, as well as security of user rights and the level of the land rent, are crucial factors in the development of urban farming. Access to prime locations is fiercely disputed. Especially subsistence type of urban agriculture often takes place on lands where property rights are in dispute. In planning land use in city development, more often than not, land allocation for urban food producers is excluded from land use plans. The policy instruments identified by the participants to achieve the objective of integrating urban agriculture in land use planning fall in the following categories:

❖ *Removal of legal restrictions.*
The first step that needs to be taken is to persuade urban planners to accept urban agriculture as a legitimate form of urban land use. Participants strongly felt that a

Youth in Lima, Peru with small gardens at school

review of existing policies and bylaws is necessary as a precondition for the removal of unsubstantiated legal restrictions on urban agriculture. Such a review should go hand in hand with the development of a number of measures to prevent encroachment on biologically sensitive areas, the use of drinking water for irrigation, or contamination of groundwater by high-external-input agriculture.

❖ *Integration of agriculture in urban development planning.* A second important step is the revision of actual urban zoning bylaws and the integration of urban agriculture in zonification plans, indicating in which zones urban agriculture is allowed (or what type of agriculture is allowed), and other zones where (certain types of) farming are prohibited, due to special conditions (eg. water retention zones). Kampala and Kumasi are two examples where such a revision has recently been undertaken (Atukunda 1998; Abutiate 1995).

❖ *Temporal use of vacant land.* Another measure is the promotion of urban agriculture as a temporal use of vacant public and private lands. For example, the governor of Jakarta issued a decree on the use of vacant land to mitigate the fallout of the Asian crisis for the laid off workers (Ning Purnomohadi, 2000).

❖ *Multifunctional land use.* The promotion of multifunctional land use and encouragement of community participation in the management of urban open spaces. Under certain conditions food production may be combined with other urban functions such as recreation, and nature conservation.

A sole reliance on food produced in rural areas is insufficient

❖ *Integration in new housing projects.* The inclusion of space for individual or community gardens in new public housing projects and private building schemes, like in Dar Es Salaam where urban agriculture was included as interim or permanent land use in public housing schemes (Mwalukasa 2000, Jacobi et al. 2000).

Food Security Policy

Analyses of current trends regarding urban food systems reveal that, in order to achieve food security for the urban poor, a sole reliance on food produced in rural areas is insufficient. It is necessary for cities to develop plans to enhance urban and peri-urban food production. This was already found to be 60% in Kampala, and 50% in Nairobi (Maxwell 1995). Policy instruments link to the following two areas.

❖ *Improved access of urban farmers to agricultural research, technical assistance and credit services.* Overwhelmingly, access of urban farmers to agricultural extension services in most cities is very restricted. If it exists at all, it is directed at full-time commercial farmers mainly producing in peri-urban areas. Consequently, urban farming is often technically inefficient and ignores the potential human and environmental risks to a larger degree than in rural areas. Recommendations include: the stimulation of participatory field research, field training and technical advice to urban farmers, and improvement of access to credit schemes. In Dar Es Salaam a broader urban agriculture programme was implemented targeting both, strengthening the self help capacity of the urban farmers, and the capacity of city and governmental extension structure to deliver services to urban farmers (Jacobi et al. 2000)

❖ *Improved systems for input supply and product distribution.* Local governments could facilitate the local marketing of fresh urban grown food, by authorising farmer markets and other forms of direct selling of fresh agricultural produce from urban and peri-urban producers to local consumers.

The supply of natural fertilisers, bio-pesticides, etc should be promoted, by providing incentives and facilitating the creation of a network of local stores, among others. Small-scale enterprises linked with urban agriculture could be stimulated by provision of licences, technical and management assistance and in the creation of local infrastructure. For example, Brasilia D.F. is furthering the integration of small-scale food production with local food processing and marketing (de Carvalho 1999).

Health Policy

One of the drawbacks of urban agriculture is the potential negative health effect. For example, cultivated areas in cities may attract rodents, mosquito breeding in puddles of rainwater, irrigation tanks and wells that may further lead to malaria or dengue. Certain diseases can also be transmitted to humans by livestock kept in close proximity to them, or related to aquaculture. Crops produced in soils polluted by local industry, irrigated with polluted irrigation water, or produced close to main roads, can be contaminated with heavy metals (lead, cadmium, etc.).

City authorities should develop and implement policies that minimise health risks without compromising the food security needs of the urban poor. Based on examples in many cities around the world, participants proposed the following measures.

❖ *Producer and consumer education.* Creating awareness among farmers of health risks associated with urban agriculture and providing information and training on ecological farming techniques, proper selection oif crops, animals and irrigation techniques, depending the local situation of soils and water is of vital importance. This should go hand in hand with clear quality standards for urban grown products and introduction of "green' or 'safe food' labels Consumers should be educated on the advantages and risks of eating fresh locally produced food and the necessity to clean and cook such food well.

❖ *Soil and water quality.* Participants recommend periodic testing of soil and water quality in zones where urban agriculture is practised. Zoning regulations

should indicate what type of crops/animals are allowed in a zone with certain type of pollution. Bio-remediation can be applied to regenerate polluted zones. Intensive use of agro-chemicals is to be prevented.

Environmental Policy

A large part of city garbage is organic, but it is often simply dumped or illegally burned. Waste water and sewage sludge contain nutrients that are of high value in agriculture. Urban agriculture can help to reduce environmental pollution by recycling solid and liquid waste in the process of agricultural production. Urban agriculture also plays a role in greening the city, helps to improve the micro-climate, to reduce erosion, reduces noise, and to plays a role in maintaining bio-diversity (see Smit, this issue). However, urban agriculture may also have some detrimental effects on the urban environment, like the pollution of local water sources, or the accumulation of animal wastes.

In order to enhance the positive environmental impacts of urban agriculture and to prevent negative effects on the urban environment, the following measures may be applied.

❖ Safe re-use of urban organic wastes and wastewater, through the establishment of low cost facilities for "close to source " collection and sorting of organic waste;
❖ Compost or biogas production (and the stimulation of applied research on composting and digesting technologies);
❖ Investments in systems for rainwater collection and storage and for small-scale water saving irrigation systems (e.g. drip irrigation) in order to reduce the demand for treated water;
❖ Introduction of preferential prices for wastewater treated to secondary level for irrigation and fully treated potable water;
❖ Farmer education on proper handling of waste and wastewater.

For example, in Lima (Moscoso 1999) a sequence of settlement ponds allows effluents of a higher quality to be safely applied at each step of treatment for a specific use (woodland irrigation, aquatic weeds and fish farming, crop farming).

Social Development

During the Havana workshop, the importance of urban agriculture for social development was stressed. It was said to enhance social cohesion in neighbourhoods and bring people together. Degraded derelict land can be transformed in green community or allotment gardens, and contribute to feelings of higher self-esteem or safety in lower class neighbourhoods. In Brazil, urban agriculture is promoted by the city authorities to facilitate the social integration of recent immigrants in the socio-economic fabric of the city by creating access to municipal land, credit and technical advice (Bakker et al, 2000). Garnett (1996) describes the positive impact on women's social well being in a community gardening project in Bradford, North England.

Policy measures can further enhance this social development within communities through urban agriculture. For instance by stimulating inclusion of urban agriculture in urban regeneration projects linking urban agriculture with educational and community development activities; allowing for communal ownership of land; and by facilitation of local exchange systems bringing local producers and consumers together.

CREATING AN ENABLING POLICY ENVIRONMENT

Historically urban agriculture does not have an institutional home. Organisations like a Ministry of Agriculture usually lack a political mandate for urban agriculture. Urban agriculture projects are rarely integrated in overall urban planning. Generally there is little co-ordination between NGOs and municipal agencies, and urban farmers are often not organised. The participants of the Havana workshop recommended a series of activities oriented at the creation of an enabling policy environment.

❖ To raise awareness among national and city administrators, planners and NGOs and to provide them with reliable data and positive examples;
❖ The selection of a national lead agency on urban agriculture and the establishment of an interdepartmental working group at national level.

The Ministry of Agriculture usually lack a political mandate for urban agriculture

❖ Stimulation of documentation and exchange of experiences at local, national and regional level through networks, workshops, exchange visits, newsletters, etc. For instance, the establishment of databases on urban agriculture with information on successful policies and projects, appropriate technologies for urban agriculture, effective and participatory planning and research methodologies, and available expertise.
❖ The creation of city level inter-agency committees on urban agriculture and stakeholder platforms for dialogue and consensus building at city and neighbourhood levels.
❖ The promotion of participatory, site specific and interdisciplinary field research with a strong policy and action orientation and stimulation of self –organisation of urban farmers.
❖ Facilitating networking and dialogue.

REFERENCES

-Abutiate WS. 1995. Urban and peri-urban horticultural activity in Ghana: an overview. In: NRI (ed.), Peri-urban interface research: workshop proceedings (UK Overseas Development Administration / British Council), Kumasi, Ghana, 23-25 August 1995, pp 45-50.
-Atukunda G. 1998. An analysis of the impact of IDRC funded research projects on urban agriculture in Uganda. Makerere Institute of Social Research, University of Kampala, Kampala. Paper presented at IDRC Cities Feeding People Workshop on Lessons Learned from Urban Agriculture Projects in African Cities, Nairobi, July 1998.
-Bakker, N., M. Dubbeling, S. Gundel, U. Sabel-Koschella and H. de Zeeuw, 2000, Growing Cities, Growing Food, urban agriculture on the policy agenda. DSE, Germany.
-Carvalho JLH de. 1999. Combatir a la pobreza ayuda a dinamizar la economia. La Era Urbana 5 (3), Suplemento para América Latina y el Caribe 1: xiv-xvii.
Garnett T. 1996. Growing food in cities: a report to highlight and promote the benefits of urban agriculture in the UK. London: National Food Alliance & SAFE Alliance.
-Garnett T. 2000. Urban agriculture in London: rethinking our food economy.
-Jacobi P, Armend J & Kiango S. 2000. Urban agriculture in Dar es Salaam: providing an indispensable part of the diet.
-Maxwell D. 1995. Alternative food security strategy: a household analysis of urban agriculture in Kampala. World Development 23 (10): 1669-1681.
-Moscoso J. 1999. El uso de aguas residuales en la agricultura urbana. La Era Urbana 5 (3), Suplemento para América Latina y el Caribe 1: xix-xxi.
-Mwalukasa M. 2000. Institutional aspects of urban agriculture in the city of Dar es Salaam.
-Ning Purnomohadi. 2000. Jakarta: urban agriculture as an alternative strategy to face the economic crisis.
-Rees W. 1997. Why urban agriculture? Notes for the IDRC Development Forum on Cities Feeding People: A Growth Industry, Vancouver, 20 May 1997.
-Yoveva A, Gocheva B, Voykova G, Borissov B & Spassov A 2000. Sofia: urban agriculture in an economy in transition.

Living with
Urban Animal Husbandry and Human Welfare
Livestock in Town

Small livestock easily kept at home, like these "cuy" in Lima, Peru

Government services concerned with livestock production for urban populations have given most attention to large-scale enterprises with exotic breeds producing eggs, milk or pork in peri-urban areas. Small-scale raising of animals by families living inside the cities is usually ignored and often forbidden. Such urban livestock keeping is much more widespread than most city authorities would care to admit. It consists mainly of low-input production of poultry, small ruminants, pigs, rabbits, guinea pigs or of a few milk buffalo or cattle, usually indigenous breeds. With deteriorating economic conditions and rapid urbanisation, small-scale urban farming, including animal husbandry, is being practised by a growing number of families in all income groups in the tropics.

Ann Waters-Bayer,
ETC International,
The Netherlands

Livestock numbers are growing in many African cities. While throughout Africa, large-scale "modern" production in peri-urban areas is declining in many countries struggling with Structural Adjustment Programmes, numerous small-scale livestock enterprises are being started up to sell through informal channels and to meet the families' own food needs.

The costs of imported inputs have soared and the luxury markets served by these enterprises have dwindled. Urban consumers are buying products from livestock reared on low-cost local resources and sold through unofficial channels rather than dairy plants or certified butchers.

Those familiar with Asian cities such as Hong Kong, Singapore or Calcutta will know how widespread is the raising of pigs, poultry and fish there, and will know of the close links between animal keepers and restaurants for feed supply and produce marketing. Likewise, those who have been in poor quarters of Latin American cities such as Lima, La Paz or Mexico City will have seen pigs, poultry and guinea pigs being raised in backyards and on rooftops.

CLASSIFICATION

Relatively little is known about the small enterprises inside the cities and between city quarters. These intra- and inter-urban livestock keepers can be roughly divided into:

On-plot. Livestock kept on-plot are often enclosed by a fence, walls or cage or are tethered, and their feed and water are brought to them. Larger animals may be allowed to graze part of the day or seasonally. Besides homeowners, also employees living on hospital and school compounds keep animals. For example, 81% of people living on the university campus in Zaria, Nigeria, keep livestock, mainly poultry and small ruminants (Gefu 1992).

Off-plot. Livestock kept off-plot tend to be grazing animals, such as sheep, goats, pigs, cattle, buffalo and donkeys. They are herded, tethered or allowed to roam freely on land used by agreement or without the landowner's consent. Some of these animals belong to the above-mentioned homeowners, but most belong to landless families. For example, in towns of northern and central Nigeria, milk is produced by settled Fulani with small herds or by Fulani who keep only their milk cows in town. The cows are grazed on unoccupied land in and near town, and are fed some purchased agro-processing by-products and crop residues. The women process the milk and sell it directly to consumers. The manure is sold as fertiliser to nearby farmers. When only the milk cows are kept in town, the rest of the herd is taken by the men to grazing pastures further from town, where a second temporary camp is set up (own observations).

Livestock numbers are growing in many African cities

Next to the above, there are various other possibilities of classification, such as according to:

- main production aim: commercial, semi-commercial, subsistance;
- scale of production: large, medium, small, micro;
- intensity of production: high, medium or low level of external inputs
- husbandry methods: free-roaming, herding, tethering, stall-feeding or a combination;
- land tenure: private, usufruct

This article was published earlier in the proceedings of the Eighth International Conference of Institutions of Tropical Veterinary Medicine, held in Berlin, Germany in 1995. This abridged version is reprinted with the permission of the author. A longer version is available on the RUAF website. The next issue of the Urban Agriculture Magazine will be fully dedicated to Urban Livestock (see the call for contributions below).

rent or lease, informal agreement, unsanctioned.
In any given setting, the most useful classification will depend on the historical development, the settlement patterns and the major resource constraints.

Urban livestock systems could also be classified according to the overall income level of the households, i.e. not only the income from animals. Some types of livestock keeping are more widely practised by the relatively rich, and others by the relatively poor. This is important to distinguish if development is to be aimed at alleviating poverty, as the functions of keeping livestock and the possible strategies for improvement will differ.

Off-plot livestock-keeping, such as roadside grazing, appears to be mainly an activity of lower-income and landless groups. On-plot livestock keeping by the poor is largely restricted to micro-livestock such as poultry, rabbits and guinea pigs, and a few small ruminants. Here it should be noted that the majority of low-income urban farmers, many of whom keep some smallstock, are women (ENDA-ZW 1994, Maxwell & Zziwa 1992, Sawio 1994). These producers have little access to veterinary care and can afford only very limited amounts of purchased feeds. Very poor urban dwellers rake up garbage to find food for their small stock, or spread out garbage piled on city streets to let their goats select from it.

For low-income as compared with high-income urban families, livestock keeping plays a far more important role as a source of food, income and security. Urban livestock keeping provides a source of employment not only for the animal keepers themselves but also for people operating in the informal supply systems: herders, sellers of leaves and grasses, and collectors and sellers of produce (Centres 1991). Poorer women go house-to-house to buy cereal bran to resell to livestock keepers in town. On urban markets and roadsides, bundles of cut grass or lopped browse, groundnut hay and other crop residues are offered for sale, not only by farmers but also by poor urban dwellers who make daily forays beyond the city to collect feed for urban stock. Some people without animals even grow forage for sale, such as the Napier grass grown around Nairobi to sell to urban livestock keepers (Lado 1990).

OPPORTUNITIES

Livestock keeping also offers opportunities at the city level. The few studies made thus far suggest that public benefits derived from urban livestock keeping include: more efficient land use; providing employment, also upstream and downstream from the production itself; reducing transport and energy costs; reducing public costs for land maintenance or municipal services; improving the supply of perishable but nutritious foods; providing lower-cost food for urban dwellers.

One of the greatest strengths of small-scale urban livestock keeping is its great mobility and flexibility. It gives value to municipal and private land momentarily not being used for other purposes, making opportunistic use of land in a positive sense.

A key opportunity offered by urban livestock keeping is waste recycling. One of the biggest problems in cities - garbage - can be a resource for animals: organic wastes from households, streets, marketplaces and agro-industries can provide valuable feed. Urban wastewater can also be a resource for urban animals and crops. For example, the City Council of Harare uses recycled water to irrigate pastures for grazing herds, and sells the meat to urban market outlets (Mougeot 1994). Another use of wastewater is aquaculture, a fast-growing form of urban livestock keeping. Fish can be raised in wastewater purified less completely than needed for direct human consumption.

Authorities must recognise the existence of livestock in town

Just as livestock can turn urban wastes into resources, also the wastes from livestock keeping can become a valuable input for urban growing of staple foods, vegetables and fruits. Indeed, it is reported from Indonesia that animal manure mixed with rejected feed and sold as fertiliser makes up a large part of cash generated from stall-kept ruminants (Orskov 1994).

The efficient recycling of sewage and organic wastes for and from animals will be one of the major tasks for research and extension services for urban livestock systems.

CALL FOR CONTRIBUTIONS ON URBAN LIVESTOCK

The next issue of the Urban Agriculture Magazine will focus on Urban Livestock (UL). The publication is planned for October.

There is a clear need for determination of the impact of urban livestock in the city and the need and effect of policy measures. Many issues you could write on, are raised in the article on Urban Livestock in this issue.

The following issues are suggested: *Concepts and definitions; Poverty alleviation; Zoonosis / Public Health; Environmental issues – waste and recycling; Policies; Gender; Economics and Market Relations; Extension /PTD/knowledge development; Ethno-Veterinary Knowledge; Cultural Preferences; Benefits and Savings; Industry-Agricultural Activity in the city.*

You are invited to contribute to this first issue of the Urban Agriculture Magazine with an article, further suggestions, description of best (or bad) practices in general, photo's and information on interesting publications, websites, workshops and training courses. Your article should give a clear description of the livestock system, the urban aspects and should address policy implications and recommendations. Articles should be written in such a way that they can readily understood by those working with farmers.
If you are interested in writing an article, please send a full draft **before 1 September 2000**, to: The Editor of Urban Agriculture Magazine, RUAF, P.O. Box 64, 3830 AB Leusden, The Netherlands, fax: + 31 33 4940791, ruaf@etcnl.nl

PROBLEMS

Living with livestock in town also gives rise to problems. As veterinarians well know, the proximity of animals to humans increases the risk of transmitting diseases. Manure, dirty bedding material, feed rests and the wastes of animal processing, if not properly handled, can attract flies and lead to water pollution. With more direct sales through informal channels, control of hygiene conditions and food quality becomes impossible, in view of the lack of laboratories and qualified staff in most developing countries. Traffic accidents may be caused by roaming animals. Neighbours often complain about the noise and odours from livestock in town.

Waste recycling using animals in India

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

Further major problems experienced by urban livestock keepers are high animal mortality and uncertain feed supply. For example, the value of animals that died annually was found to be higher than the value of animals consumed or sold by urban cattle keepers in Nairobi (Lee-Smith & Memon 1994). It will be a challenge for livestock services to find economic ways to reduce mortality.

ACTION

Many planners in developing countries regard urban livestock keeping as a transitory phenomenon. However, there is no indication that livestock and other forms of farming decrease, the longer people live in cities. Indeed, quite the contrary appears to be the case.

In the past, government support was given mainly to large-scale intensive meat, milk and egg production units. Government incentives included tax exemption, low-interest credit and subsidies on inputs and/or outputs (Krostitz 1984). Recent economic changes have put an end to many of these ventures, particularly in Africa. A study of the effect of structural adjustment in Nigeria revealed that small-scale food producers are reacting more flexibly and productively than the large-scale units, and further financial support for the latter is strongly questioned (Porter 1994).

More research is needed

Micro-entrepreneurs have developed inner-city livestock keeping through processes of indigenous innovation, without external support. Development agents and government officials are only beginning to recognise what is happening under their very noses. The questions are now: What can and should be the role of government and development agencies in the face of these local initiatives? How can urban livestock keeping be assisted to alleviate poverty and improve human welfare in cities?

First of all, authorities must recognise the existence of livestock in town. Official recognition makes it easier for veterinary and extension services to deal with the dangers of livestock to human health and environmental quality, and to maximise the opportunities.

More research is needed into livestock-keeping systems and their constraints, taking into account the concerns and values of the producers themselves, their neighbours and city authorities. The results of such studies need to be made widely known among political decision-makers in clear, concise language.

Information also needs to be spread to producers and consumers about livestock-related dangers for human health and how to avoid or reduce them. Development agencies should be creating opportunities for livestock keepers and other city dwellers to communicate with each other, understand each other's actions and encourage changes in behaviour. One possibility would be to promote producer organisations: common-interest groups which can negotiate with other local stakeholders in jointly defining and implementing regulations for using urban resources such as garbage or public land for grazing. Governments need to set up policy and services which favour small-scale livestock production based on local inputs: encouraging the use of local non-conventional feeds and focusing on animal species and breeds (e.g. local cattle, buffalo, goats, rabbits) which can use the available roughages and depend less on concentrates. Combined efforts of farmers and animal nutritionists will be needed to identify locally-available resources and to design feed mixtures to meet the needs of different animal species. Particular attention needs to be given to the role of women in urban livestock keeping.

In summary, the challenge for veterinary services confronted with the reality of livestock in cities is to interact in a positive, enabling manner with urban dwellers, rather than making vain attempts at banning livestock. What is needed from government services is well-founded and locally applicable information and appropriate low-cost inputs for healthy and productive livestock in town. All stakeholders will then be in a better position to make wise decisions when jointly planning the use of urban resources for livestock keeping and other sources of livelihood for urban dwellers.

REFERENCES

- Centres JM. 1991. Améliorer l'approvisionnement de Bamako en produits maraichers et en protéines animales. 1. Agriculture et élevage à Bamako. GRET, Paris, n.p.
- ENDA-ZW. 1994. Urban agriculture in Harare: report on an IDRC-supported project. ENDA-Zimbabwe, Harare, 47 pp.
- Gefu JO. 1992. Part-time farming as an urban survival strategy: a Nigerian case study. In: J Baker & PO Pedersen (eds), The rural-urban interface in Africa. Scandinavian Institute of African Studies, Stockholm, pp 295-302.
- Krostitz W. 1984. Poultry development in the developing countries. World Animal Review 52: 17-23.
- Lado C. 1990. Informal urban agriculture in Nairobi, Kenya: problem or resource in development and land use planning? Land Use Policy 7 (3): 257-266.
- Lee-Smith, d. & P.A. Memon. 1994. Urban Agriculture in Kenya, IN\n: A.G. Egziabher et al. (eds) Cities Feeding People: An Examination of Urban Agriculture in East Africa, Ottawa, IDRC.
- Maxwell D & Zziwa, S. 1992. Urban agriculture in Africa: the case of Kampala. ACTS Press, Nairobi, 74 pp.
- Mougeot LJA. 1994. Urban food production: a survey of evolution, official support and significance. Habitat 94, 20 September 1994, Edmonton, 42 pp.
- Orskov R. 1994. Landless livestock keepers. ILEIA Newsletter 10 (4): 24.
- Porter G. 1994. Food marketing and urban food supply on the Jos Plateau, Nigeria: a comparison of large and small producer strategies under "SAP". The Journal of Developing Areas 29: 91-110.
- Sawio CJ. 1994. Who are the farmers of Dar Es Salaam? In: AG Egziabher et al. (eds), Cities feeding peoples: an examination of urban agriculture in East Africa. IDRC, Ottawa, pp 25-46.

Backyard vegetable garden in Cagayan de Oro, Philippines

The importance of home gardens is often underestimated. The small areas of cultivated land immediately surrounding a homestead make a vital contribution to meeting various household needs, both rural and urban, in developing countries. Providing research and development support to home gardens is even more significant as it implies reaching out to the "invisible farmers" – women and children who often play the key role in establishing and maintaining home gardens.

Dynamics in Tropical Home Gardens

Sponsored by the International Potato Centre (CIP), the Programme, Users' Perspectives with Agricultural Research and Development (UPWARD) is an Asian agricultural research and development network dedicated to enhancing participation of users in technology and application, especially by marginalized groups such as women home gardeners.

HOME GARDENS IN PHILIPPINES

Home gardens are the small areas of cultivated land immediately surrounding a homestead. There has been an increasing number of global and local initiatives to promote and support home gardens since the 1980s. Most of the initiatives so fare have been directed to improved household income, food production and family nutrition. Less attention has been given to exploring the inherent diversity within home gardens, and assessing its contribution to the achievement of the multiple functions and goals of this particular production system

Earlier studies by UPWARD (e.g. Verdonk and Vrieswijk 1992; Mula and Gayao 1992, Gayao et al. 1992, Prain and Piniero 1995) have not only confirmed the prevalence of home gardens in tropical Philippines, but also highlighted the intimate and interdependent relationship between the food security and nutrition improvement functions of home gardens, and their potential as a vehicle for helping to conserve local biodiversity.

These studies also showed that home gardening is also common among both rural and urban households. The choice of garden crops is generally a function of the intended use of the garden produce, e.g. food needs of the household, feed for backyard animal raising, or cash crops which serve as a potential source of added income, and further aesthetic interests of household members.

The range of crops is extensive, from vegetables and multi-purpose tree species to medicinal herbs and forage grasses. Most notably, assessment results suggest that the more biologically diverse a garden, the more likely the family is to consume a nutritionally healthy range of food types.

(BIO)-DIVERSITY DYNAMICS

Following up on these earlier works, UPWARD initiated a study in 1994 in southern Philippines to further examine biodiversity issues in home gardens, and their links to household strategies for food security and family nutrition. The study sought to:

- characterise the prevalent home garden systems in the area;
- assess their crop species diversity;
- identify home gardeners and their management of diversity;
- evaluate and enhance the contribution of home gardens to various house holding objectives.

Lantapan, the study site, is part of the Manupali watershed in Mindanao island. Elevations range from 320 to 2938 meters above sea level, extending from rain fed paddy fields to partially cleared forestlands. An initial survey revealed increasing erosion of biodiversity in the watershed. Plant and animal species were displaced due to deforestation and a shift away from subsistence farming towards a commercial monocropping system.

One recommendation to arrest further biodiversity loss and to help local households satisfy food and cash income needs, was through home gardens. To identify opportunities for introducing and testing improved home garden management practices, preliminary assessment and long-term monitoring activities were conducted through a mix of participatory methods and tools.

Fig. 1: Location of the Manupali Watershed, Lantapan, Bukidnon, Philippines

A complete inventory of home garden plants in the Manupali watershed identified 167 plant species which include 24 forest trees, 25 fruit trees, 4 cereal crops, 31 vegetables, 4 root crops, 20 herbs, 5 spices, and 54 ornamentals (Prain and Piniero 1994). The inventory supports the hypothesis that home gardens in the tropics adopt the vertical distribution of biological diversity found in

Raul Boncodin, *Programme Associate* **Dindo Campilan**, *Co-ordinator, CIP-UPWARD, Makati City, Philippines,* **Gordon Prain**, *Global Co-ordinator, CGIAR Strategic, Initiative on Urban and Peri-urban Agriculture (SIUPA), CIP, Lima, Peru* *(see page 34)*

Home garden contribution rises nearly to 50% among those in the lower income bracket

natural communities (Troutner and Holle 1979). The home gardens across the watershed varied widely in terms of their species composition, which ranges from 4 to 35 species and are maintained and harvested year-round (Medina et al. 1996).

Home garden diversity also varies according to the three distinct agro-ecological zones of the watershed. Home gardens found in the middle zone (at an altitude of approximately 700-1500 meters above sea level) have more plant species than those found both in the upper (1500 - 1800 meters) and lower (below 700 meters) zones. The dominant species in the two lower zones are the perennials (e.g. herbals, fruit and forest trees), thus no significant change in species composition in these zones was observed over the two-year monitoring period. The number of species in the upper agro-ecological zone, however, significantly varied over the same period. The gardens in this zone are planted with vegetables and ornamentals, which were mostly annuals, and thus much more reflective of other changes going on in households maintaining these gardens.

The study indicates that home gardeners in the area have consciously evolved some rather specialised management strategies, which cannot only be attributed to the differences in the micro-environments. This impelled the researchers to analyse the relationship of home garden diversity to socio-economic variables. The analysis was able to substantiate the effect of the gardener's occupation and economic or wealth status to her home garden management strategies. Home gardens of farmers of the lower economic strata, are dominated by annual crops primarily for utilitarian purposes. Those maintained by professional and self-employed gardeners, belonging to the higher economic strata, are dominated by perennial crops primarily for homesteads' beautification and are mostly found in residential or "peri-urban" areas.

HOUSEHOLD FOOD SECURITY

Local households reported that home gardens contribute an average of 14% of daily food intake costs, which is 22% of the average household daily wage. More significantly, home garden contribution rises nearly to 50% among those in the lower-income bracket. It is not surprising therefore that home gardens maintained by the poorer households are dominated by annual vegetable crops.

The two-year long quarterly monitoring of home gardens also revealed cyclical changes in biodiversity ranges. Home garden diversity decreases during the dry season, which lasts from February until May. The onset of the rainy season in June is accompanied by an increase in diversity, peaking in November/December when most of the garden crops, planted at the start of the season, are ready for harvest or have been harvested.

Home garden crops are most important during the lean months, which start in May and become critical in July. By this time, the harvest of the previous field crops, such as rice and corn, have run low, but newly planted field crops are still not harvestable. Opportunities for casual labour are also few and far between at this time, putting further strain on family resources. Drought-tolerant crops planted early in the garden and early-maturing crops that can be quickly harvested are thus of great importance to supplement the households' food needs through these hard times. This is especially the case for the low-income home gardeners in the upper agro-ecological zone where the lean months most severely affect the households.

FAMILY NUTRITION

A total of 33 different food crops were identified in local home gardens including green, leafy, and yellow vegetables; starchy roots and tubers; as well as legumes, beans, nuts, and spices. While home gardening is directly aimed at providing subsistence and supplementary household food supply, it was shown to concurrently make a significant contribution to the amount of nutrients and variety in the household food intake. Home gardens provide year-round food supplements to households not only in terms of quantity but also in terms of food diversity and variation.

The study showed that home gardens play an important role in provision of Vitamin A, (compensating for the lack of retinol in the diet of local households) and Vitamin C while they also supply one-third or more of calcium and iron needs. These results are consistent with the findings in a similar study on urban home gardens in the Philippines (Velez 1997).

LINKING BIODIVERSITY CONSERVATION AND USE

Aclose correlation between household food security and nutrition improvement on the one hand, and home garden biodiversity conservation on the other was found. This offers significant research opportunities for exploring ways to improve and consolidate these complementary functions of home gardens in overall household management.

From the assessment results, the UPWARD project has subsequently worked with home gardeners to test and introduce new crop species and accompanying home garden management practices. The follow-up participatory action research, consisting of home garden trials, validation workshops and field monitoring, has a three-fold objective: first, to enrich the inherent biodiversity of home gardens; second, to improve access, regularity and adequacy of food supply for households; and third, to enhance nutritional quality in the household diet through the diversity of food crops made available by home gardens. Medium- and long-term impact assessments are still being carried out.

REFERENCES

- Alvarez N. 1997. Biodiverse farming produces more. Seedling 14 (3): 6.
- Gayao BT, Alupias EB, Sim JM, Quindara HL, Gonzales IC & Badol EO. 1992. Sweet- potato household gardening development. Progress report. La Trinidad, Benguet, Philippines: NPRCRTC-BSU.
- Medina C, Prain G & Locht J van de. 1996. Assessing and developing the contribution of home gardening to biodiversity conservation and household nutrition. Paper presented at the UPWARD Participatory Monitoring and Evaluation Workshop, Pampanga, Philippines, 14-15 December.
- Mula RP & Gayao BT. 1992. Urban and rural home gardens in the highlands of the Northern Philippines: The case of the sweet-potato. Final report. La Trinidad, Benguet, Philippines: Benguet State University. 86 p.
- Prain G & Piniero M. 1994. Communities as Curators of Plant Genetic Resources: the case of rootcrop conservation in Southern Philippines. In: Prain G. (ed.), Conservation and Change: farmer management of agricultural biodiversity in the context of development (Los Baños, Laguna, Philippines: UPWARD).
- Prain G & Piniero M. 1995. Approaches to community-based PGR conservation. In: UPWARD, Taking Root: Proceeding of the 3rd UPWARD Review and Planning Workshop (Los Baños, Laguna, Philippines: UPWARD).
- Troutner M & Holle m. 1979. The homestead area in the atlantic zone of Costa Rica: An efficient agroecosystem. Paper presented at the Meeting of American Society for Horticultural Sciences, Tropical Region, Mexico, November 1979.
- Velez C. 1997. Home gardening as a strategy for food and nutrition security: a case study of selected households in Lantapan, Bukidnon. MSc paper in Applied Nutrition, submitted to the Faculty of the Graduate School, University of the Philippines, Los Baños.
- Verdonk I & Vrieswijk B. 1992. Sweetpotato consumption in two municipalities in the Cordillera. Project Terminal Report. Los Baños, Laguna: UPWARD.

The Greening of **Ahmedabad**

An Innovative Urban Community Forestry Model

Ahmedabad is a very dynamic industrial city in India with a long-standing history in the textile sector of India. The textile crisis in the seventies hit this 'Indian Manchester' hard, but today Ahmedabad is again known as a city bustling with industrial and commercial activities. The cities ongoing growth has been marked by a substantial influx of population, growth of slums and unauthorised colonies and a subsequent environmental decline. This deterioration of the environment in Ahmedabad is not only visible in the settlements of the poor, but in the city as a whole, and this fostered a process of awakening and awareness about the urgency to introduce corrective measures.

In 1995, the Centre of Environmental Planning and Technology (CEPT), with support from USAID, carried out an Environmental Risk Assessment for the City of Ahmedabad. A major finding of the study determined that the city's ambient air quality was a major health risk to its residents. In response to these findings the Ahmedabad Municipal Corporation gradually evolved a comprehensive approach, "the Greening of Ahmedabad Program" which includes efforts in various fronts to tackle the city's air pollution problems.

Responding to the decline in the city's environment, the Ahmedabad Municipal Corporation (AMC) has launched various improvement projects, in infrastructure, slum improvement projects, and initiated the "Greening of Ahmedabad Programme".

The Greening of Ahmedabad is a concerted effort between the Ahmedabad Municipal Corporation (AMC) and the Private Sector. It aims to increase the green cover and improving the environmental quality of Ahmedabad. The main components of this Programme are activities like the greening of roadside and traffic islands; park and garden development and maintenance; city forest development; and natural regeneration and wasteland restoration on vacant lots (taking the preservation of the city's watershed as a high priority).

Through partnership agreements with interested parties, like business and industrial houses, local entrepreneurs, institutes, service oriented organisations and NGOs the greening of the city is increased, developed and maintained. For instance companies such as Syntex Ltda., Torrent Lab., Anil Bakery, Ashima Sintex Ltda etc. are involved in "road side plantations", "development and maintenance of new and existing parks and traffic islands". Under the Greening of Ahmedabad Programme, the AMC also launched the Ahmedabad Green Partnership project (AGP) as part of this greening drive.

The AGP has been initiated as an innovative scheme using the concept of '-partnerships' and 'participation' as its main ingredients. The city has managed to launch this program as an initiative that provides responsibilities and space for innovation to its citizens, to civic organisations and to private sector enterprises. For example, in an effort to increase road side tree plantation, private and public sector institutions were offered to "adopt" plantation units (500 meters long, with trees planted at 5 meter spacing) along the main roads of the city. They provide the funding for the saplings and the tree guards while maintenance is done by AMC. In exchange, they are allowed to advertise their logos on the tree guards. Through this effort, between 1996 and 1997, a total of 16.292 trees have been planted along main roads

Table 1: Parks and Gardens

Size	No. of gardens	No. of traffic islands	Maint. by AMC	Maint. by privite s.
Up to 2 acres	38	45	30	15
From 2 to 5 acres	19	-	17	2
Above 5 acres	15	-	12	3
Totals	*72*	*45*	*59*	*20*

Liliana Marulanda S.
Independent consultant in Lima, Perú.

After 5 years
the project will achieve
financial sustainability

THE "AHMEDABAD GREEN PARTNERSHIP" PROJECT (AGP)

The Green Partnership is an initiative by the Ahmedabad Municipal Corporation (AMC) to utilize empty plots, owned by the AMC, for urban forestry related activities in partnership with NGOs working with poor communities and other citizens groups. This idea took quite some time to evolve into a feasible and beneficial approach for the parties involved.

The approach has been developed with the support of RHUDO/USAID. After the Program Guidelines were developed through several workshops, and agreed a total of 17 plots were allotted to and agreements were signed with 12 NGOs for undertaking an equal number of forestry and other greening related activities in these plots.

Objectives

The objectives of the AGP Project are:

- To contribute to the greening of Ahmedabad through the development of urban forest and other greening related activities in vacant plots owned by AMC.
- To facilitate and encourage participation of low-income residents, especially women, through the formalisation of public-private partnerships.
- To increase, through such partnerships, the income generation possibilities for low-income residents of the city.

Operation and Management

Under the AGP, plots owned by AMC, are offered to NGOs and other organisations for the development of urban forestry and related activities. Plots were allotted for a period of 5 years, with possibilities of extension of other 5 years. The Ahmedabad Green Partnership is managed by the Director Parks and Gardens under the Department of Special Estates, Parks & Gardens of the AMC. The list of available plots was prepared by the State Department of the Municipal Corporation.

Plot demarcation and water connections were provided by the AMC. Fencing, construction of sheds and preparation of the land was carried out by NGOs. Plantation work started when weather conditions were appropriate (in this case plantation work could only start during the monsoon season).

For the fiscal year 1997/1998 the AMC budgeted Rs. 15 million (1U$ /34 Rs) for the greening of the city. Yearly provisions of Rs. 10 million have been made for implementation of the AGP in the next four years.

Financial resources are granted by AMC to the implementing organisations for fencing, saplings, tools, fertilisers, a portable shed and other expenditures for the first year. Additionally, the AMC provides one water connection, while the organisations are responsible to provide for wages, maintenance, security and other planned amenities, which were not covered by the grant.

For the second year funding will be available only for items such as watering, weeding and fertilisers. For the third year onwards, 10% to the amount provided for the second year will be granted. It is expected that after a period of five years the projects will achieve financial sustainability.

Projects under the AGP

To give an example of the project activities a number of projects will be described below.

The Centre for Environmental Education is supporting a group of associated students to develop a plot into an urban forest for research and academic purposes. The main objectives are creating awareness and understanding among communities of the importance of green areas in cities, to create avenues, to develop and disseminate information on the diverse species that can thrive as an urban forest.

Akhil Bharatiya Vanaaushadhi Abhyas Mandal is active in propagating ethno-botany and conservation of the environment. They are developing a plot into a garden of medicinal trees and plants for the benefit of the community and the city.

The State Bank of India Officers Association is the trade union of the bank officers. It is developing a plot into an urban forest, through its Social Service Wing which implements small projects for the benefit of communities and the city in general, while providing a good corporate image to the Bank.

Under the Green Partnership, Self Employed Women Association (SEWA) –an internationally well known NGO and winner of the HABITAT II award for its housing programmes- got allotted two plots, located in residential areas, which are used to generate employment for the members of the unions and to contribute to the greening of the city.

ISSUES FOR THE CONSOLIDATION OF PARTNERSHIPS

The following lessons are learned:

In the initial stages flexibility is needed, to give room for identification of potential problems, and the necessary adjustments. Technically realistic criteria have to be set for plot selection, taking into account site-specific conditions, well in advance so that the extra inputs and resources required for its development are known to the parties involved, when the plot is allotted.

Full agreement of the proposals is needed, in order to assess at beforehand, the land uses allowed under the agreement, but also for evaluation purposes. The involvement of residents, in the preparation, monitoring and evaluation of the areas where plots are located is vital for the success of these projects. This process

This paper is based on the Documentation Report of the Ahmedabad Green Partnership Project prepared by the author for the Regional Housing & Urban Development Office (RHUDO) of the United States Agency for International Development (USAID), New Delhi, India, 1997. With some modifications, it also will be presented in the International Symposium on Urban Agriculture to be held in Berlin July, 2000.

takes time but will prevent confrontations, which only disrupt project implementation.

Projects should further financially be feasible, to ensure sustainability and to avoid or minimise the need for subsidies, as it is the case for the AGP component of the Greening of Ahmedabad Programme.

Since each organisation or project has different characteristics, objectives and approaches. It is difficult for a government office alone to monitor day-today needs and provide the assistance required. This is why it is advisable to count on the mediation of an appropriate institute/organisation to act as a mediator between the municipality and the implementing agencies.

For most of the grassroots organisations, the partnership arrangement is a completely new experience. They are motivated with the perspective of deriving some benefits, while contributing to improve the green cover of the city. Assistance in technical matters and in the development and implementation of participatory approaches will greatly help to maximise the resources and outputs of these projects.

RELEVANCE OF THE AGP FOR URBAN DEVELOPMENT POLICIES

The AGP includes very relevant and innovative features, which can radiate very positively when they are adopted and/or included in the development policies of a city. From this particular case there are three aspects we would like to highlight.

Urban Agriculture as a Strategy

Urban agriculture and forestry, and other greening related activities could be feasible strategies towards improving sustainable city development. In this particular case, both, the parties involved and the city environment are benefiting from the decision to include urban agriculture activities within the urban development framework. Private institutions create the opportunity to a socially responsive oriented outlook while sharing benefits and responsibilities with the municipal administration. The latter in turn, combine the solution of environmental problems with working on economic and social problems. The green coverage of the city further decreases air pollution and creates a healthier urban environment. Finally, a substantive amount of jobs and incomes can be created.

The Partnership Approach

This experience shows that the partnership approach is indeed a viable alternative to supply an efficient service at lower costs. Important to note, is that the joint effort is understood as an opportunity that benefits all the parties involved but at the same time entails clear responsibilities. The development of transparent tools, like in this case a very simple and clear contract and an expedite, red tape free, application and plot award process, has encouraged the participation of the private sector partners. Apart from the commitment, the partners must have the capacity and skills necessary to fulfil their responsibilities. In certain cases, technical assistance may be needed. Success further depends on realistic planning and programming.

Planning for Urban Agriculture

A first step is that urban agriculture and urban forestry activities are considered as part of the strategy in urban sustainability. Then the city needs to plan for it to happen. Sanctioning of land is a requirement to formalise further implementation. City managers and planners need to take into account that trees and crops are long-term products and that these investments need proper time to yield benefits. This is especially valid for those plots that belong to the municipality; the private partners need the certainty that there is time to recover their investment.

A substantive amount of jobs and incomes can be created

CONCLUSIONS

The use of partnerships for the development and maintenance of public services is paying good dividends to AMC. The Ahmedabad Green Partnership Programme demonstrates that when the rules of the game are clear, partnerships between governments, NGOs, CBOs and other citizens groups are viable development options, which offer benefits for all parties involved.

With transparency, commitment, continuity and efficient administration from the AMC, the private sector, including low-income residents, have been encouraged and enabled to respond and support the government in making Ahmedabad a healthy, green and less polluted city.

Urban agriculture, urban forestry and other greening activities need to be recognised by urban managers and planners as viable development alternatives. Especially those aimed at improving the living conditions of the urban poor will help to develop better cities of which not only we but future generations can feel proud of.

The Urban Farmers of St Petersburg

The Urban Agriculture Magazine tends to focus on regions in the South. Most contributions and case studies draw heavily on experiences in Asia, Africa and Latin America. And as an initiative under RUAF, this is not surprisingly so. Another project on urban agriculture ETC Ecoculture is called "Soil and Water Management in Agricultural Production in Urban Areas in CEE/NIS Countries" (SWAPUA). The St. Petersburg Downtown Gardening Club is one of the six Eastern European organisations active in SWAPUA.

Annually up to 2,5 million inhabitants are involved in agricultural activities in St. Petersburg. The total area cultivated by city dwellers around the city is 560,000 ha, and in the summer time over 500,000 of them constantly live on their summer residences and other types of buildings on plots.

Oleg Moldakov,
St. Petersburg Downtown Gardening Club,
St. Petersburg, Russia

The main reasons for city dwellers to practice farming are (Moldakov, 1999):

- self-sufficiency, especially the supply of fresh green food;
- additional income, through the sale of fruits, vegetables, eggs, milk, and flowers. People's expenditures for food are very high, up to 60% of total income; pensions are very low and unemployment is high.
- access to "healthy" food
- leisure
- productive use of "free" resources, such as kitchen wastewater and residues.

Mainly middle-aged and elderly people carry out urban agricultural activities, falling between the ages of 35-45 and above; younger people are not interested or are engaged with other occupations. The technologies applied by these urban farmers are normally very basic: hand labour and simple tools.

In 1998, the urban farmers of St. Petersburg produced: 15,800 tons of potatoes; 47,400 tons of apples, pears and plums; 38,500 tons of vegetables; 7,900 tons of strawberries; and 23 million cut flowers on the plots (Maydachenko, 1999b). This is more than all agricultural farms of the Leningrad Region.

Urban agriculture is practised in the inner city and in the peri-urban areas. In the inner city the farming takes place in backyards, in public lands and vacant space near the houses, basements, rooftops, balconies, windowsills.

The areas for peri-urban farming may be located at the city boundaries (commercial or subsistence-oriented) or at larger distances (10-100 km). The latter includes the large amount of allotments with weekend or summerhouses, which are worked by Petersburg citizens during weekends in the summer periods. Thousands of urban people spend almost every weekend in these areas from mid-April until the end of October.

The agricultural activities provide an important way to solve the poverty and unemployment problems.

Selling products from the garden on the streets

HISTORY

The history of the urban gardening movement in St. Petersburg dates back to the end of the nineteenth century, when village noblemen moved into the city but kept their farming practices. They were the first to create a summer residence cum farm outside the city.

Until the Soviet period, St. Petersburg practically had no real urban area, but consisted of many one-level houses made of wood with small gardens and animals. The Soviet authorities did not welcome agricultural activities in the city, and built new multi-story apartments and subsequent infrastructure. Inner city agricultural activities, such as cultivation and selling of flowers or growing vegetables for sale, were allowed only to urban and suburban pensioners and invalids.
Individual subsistence oriented agricultural activities were permitted to rural and peri-urban inhabitants, but were limited by the significant tax to land-property.

Approximately from the beginning of the sixties, some urban families in St. Petersburg were

allowed to engage in agriculture on small sites in suburbs. Such sites were in the premises of suburban plants, of schools or hospitals, and the urban authorities did not object to such small gardens for their own use.

At the same time, others had the opportunity to cultivate for own use in community gardens in peri-urban areas created by co-operative societies. These gardens were divided into numerous clusters of plots of about 0.1 ha with small houses. Initially, these 'dachas' were exclusively state properties and were placed at the disposal of the Soviet Union's new "high society", formally for temporary use, but in reality they could be owned for life and inherited by the next generation. Their inhabitants were Communist Party functionaries and outstanding scientists, artists, actors, etc. These were places for relaxation and the agricultural activities represented no more than an exotic hobby.

After the Stalin era, some lands in peri-urban areas were made available to the DSK ('Association for cooperative building of single storey cottages'), which aimed to build for ordinary people. Small summer-houses were built on plots of around 0.1 ha on the basis of cooperative fees by special building companies and these houses were regarded as the assets of the dacha-building cooperative union. Since the late 1970s almost all Soviet enterprises and organizations began to ask the local authorities for permission to acquire plots for gardening, with single-storey houses on them. Usually lands placed at people's disposals were forest sites or on unused land, located 2-3 km from railroads or motorways and 10 up to 100 km from the cities. The plot-owners' main objective was to grow fruit, ornamental plants and vegetables for home consumption, while any surplus could be sold to neighbors and any chance purchasers. From 1985 onwards enterprises and organizations also helped their staff members with loans in order to acquire their plots of land. Between 1986 and 1996 the number of dacha-owners doubled.
In the period of radical changes and economic crisis 1989 - 1996 the need to cultivate land was guided by the logic of survival. Since then, under the market economy, the agricultural production in the city became difficult, for instance because the cost for the transport has increased for non-pensioners and children (Maydachenko, 1999a). Market oriented production became unprofitable (Maydachenko, 1999). Still however, many people, with the time and means to cultivate, aspire to get their own peri-urban plot by any means possible. St. Petersburg provides to all pensioners a subsidy on public transport costs in order to allow them to go to their plots and cultivate for their subsistence.

The St. Petersburg Downtown Gardening Club (STDTGC)
The St. Petersburg Dopwntown Gardening Club has developed out of the Centre for Citizen Initiatives USA-Russia (CCI), a non-profit foundation. A group of enthusiastic people decided to establish this Club, as an effort to make the city more natural and ecological. The Club was officially registered in 1992 as an NGO.
In 1993 a Rooftop Gardening Programme (RGP) started. The main goal was to try out the gardening techniques developed by Dr. Martin Price of ECHO ("Educational Concerns for Hunger Organisations") for gardening on apartment-building rooftops (Martin, 1997).

The advantages of rooftop gardening in urban areas are many:
❖ large amounts of extra food can be raised
❖ household wastes can be directly utilised; the Club used empty basements to accommodate special containers with California redworms that recycle kitchen wastes into compost, which is subsequently used as fertiliser for the rooftop gardens (Gavrilov, 1997)
❖ people can engage in gardening right where they live and do not need to travel far from the city; women with young children can engage in gardening, generating income, while staying close enough to the home to look after the children.
❖ improved ecology (household waste recycling; production of oxygen: one roof top garden of 150 m^2 can create enough oxygen for 100 people to breathe for one year)
❖ people in the city can feel closer to nature
Next to rooftop gardening the Club also started kitchen gardens in the "Kresty" (Cross) city prison, developed a model ecological apartment building (Eco-House), started gardening as a therapy at the prosthesis institute, and participated in a school gardening and recycling projects. The Club focusses now on the creation of better marketing conditions for small urban and peri-urban farms and promotes urban agriculture as an integral part of the urban productive system.

TYPES OF URBAN AGRICULTURE IN ST. PETERSBURG

Several types of urban agriculture have been established. There are the former co-operative types: Dacha, Sadovodstvo and Ogorod; as well as individual land plots.

Dachas are blocks of gardening plots (0.08-0.15 ha) with cottages. They are usually located in the peri-urban area of the older cities and are presently under private ownership. There are approximately 150,000 dachas in the Leningrad Region, most of them 50 km. from the city. The production is mainly for subsistence.

A *sadovodstvo* is a gardening community, consisting of 50-600 gardening plots (usually 0.06 ha), with small summer houses and a common infrastructure (roads, wells). Sadovodstvos are usually located in the peri-urban areas of new and industrial cities and towns, and are now under private ownership. Today there are some 2800 officially registered gardening communities located in areas around St. Petersburg which include 560,000 plots (Maydachenko, 1999a). They also produce mainly for subsistence.

An *ogorod* is a gardening plot (0.02-0.3 ha) without any buildings, and often with no or little infrastructure, and mostly informal or even illegal entities. Ogorods are usually located in the peri-urban areas of small towns. Ogorods are on municipal lands or privately owned. Thhere are some 180 000 plots (Maydachenko, 1999a).

The agricultural activities provide an important way to solve the poverty problems

Factory gardens and greenhouses; during the communist period nearly all plants

The City authorities in St. Petersburg consider urban and peri-urban farming to be a major social factor

and factories used to grow food in gardens and greenhouses to feed their employees in its canteens. Especially older, larger companies and military firms continue to do so. Land under greenhouses is in municipal or private ownership.

Individual permanent houses with backyard gardens can still be found in the older parts of the city and in the city periphery (often privately owned or municipal property)

Various households and private entrepreneurs use the *basements* to grow mushrooms, other use the *rooftops and balconies* to grow vegetables, other use these places to process fruits and vegetables

In the periphery of the city one encounters *conglomerates of private parcels of land that formed part of a former collective and state farm.* These lands are a now belonging to the former labourers of the collective or state farm. The production is more integrated, including small livestock and fruits, and aims at both subsistence and market production.
Furthermore, former kolhozes and sovchozes are transferred in a "company with limited liability" and maintained as *large-scale, fully commercial farms,* with the former kolhoz- or sovhoz- members as shareholders of the company.

REFERENCES
- Afanasjev O., Gardener and Law, Moscow, 1998
- Boyko Oksana, The Day of Gardener has appeared, Neva time No 55 (1936) March 27, 1999
- Competition " Most - most... ", Petersburg Vedomosti No 107 (1781), June 10, 1998
- Gavrilov Alexander, Roof top gardening in St. Petersburg., 1997
- Marjina T., Dispute on the land plot boundary, Petersburg Vedomosti No 87 (1761), May 13, 1998
- Maydachenko Roman, Kitchen garden in city boundaries: family help or financial servitude? Petersburg Vedomosti No 182 (2096), October 1, 1999
- Maydachenko Roman, Are any land plots available? Petersburg Vedomosti, No 76 (1991), April 26, 1999a
- Maydachenko Roman, Gardeners are pleased with them, Petersburg Vedomosti, No 56 (1971), March 30, 1999b
- Moldakov O., City survey on urban gardening in St-Petersburg, 1999
- Preriev Ilya & Gunt Boris, "Summer residences: yesterday, today, tomorrow", "Land and Freedom" electronic journal, N18 (215) May 7, 1998.
- Sokol A.Ya., Roof top gardening. 1996
- St-Petersburg Land resource Management Department Report, St-Petersburg, 1998

NATIONAL AND LOCAL POLICIES

The current Russian law allows and even stimulates the existence and further development of agricultural activities in the city and its periphery. For example, one clause mentions, that the authorities *are obliged* to help the gardening associations on important issues, such as construction and reparation of roads, transmission lines, water drains and water supply. Local authorities are also supposed to facilitate the transport of gardeners to their sub-urban plots and summer residences (Marjina, 1998).

City authorities in St. Petersburg consider urban and peri-urban farming to be a major social factor and means of subsistence for at least 2 million citizens (total city population nearly 5 million). St. Petersburg city budget provides to all pensioners a subsidy on public transport costs in order to allow them to go to their plots and cultivate for their subsistence. From May to October, twenty-five specialised medical ambulances serve gardening and country facilities. An Information Centre for gardeners has been created to assist in the "management and development of kitchen gardens".
The City of Petersburg operates an Office for the Development of Horticulture and Gardening in St. Petersburg and the Leningrad Region, which co-ordinates the activities of state agencies and local government agencies. One of the other activities of the Office is the organisation, jointly with the "Union of Gardeners" of the yearly competition "Gardener of the year" as an effort to promote technological innovation and "rational" land use.

MAIN PROBLEMS

Despite the fact that the authorities of St Petersburg disburse funds for services to (peri-) urban gardeners for garbage collection, maintenance of roads, wells, etc., gardeners complain that the living conditions in the garden communities are not up to standard as in the city itself. They refer to police control and health care services, amongst others.

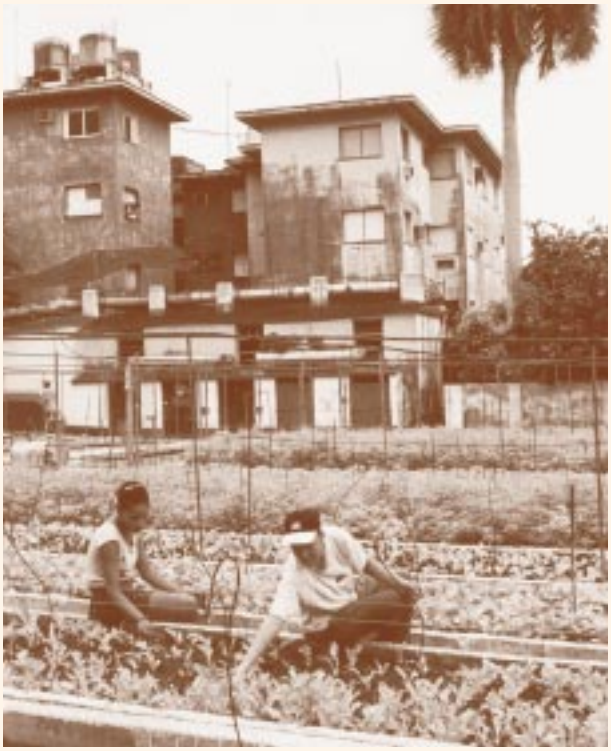
Peri-urban counties claim to be compensated for their extra administrative expenses for services to the almost two million St Petersburg residents, who spend their summers in peri-urban locations. One must consider that one garden area alone, "Trubnikov the Boron" in Tosno, houses 50,000 summer residents, while in the nearby "Danube" garden area, almost 100 thousand gardeners are active during summer weekends.
Another key problem is the marketing of the produce. The businessmen from St Petersburg only come irregularly and transport is costly.

Theft is also a major problem in the gardening areas. It has been proposed that police from St Petersburg helps the local police to patrol the gardening complexes.

Other constraints for the further development of urban agriculture are:
- absence of a clear strategy for the development of urban agriculture in St Petersburg;
- insufficient information on nutritional, socio-economic, ecological and health aspects of urban gardening;
- the shortage of written information (books, articles) on urban agriculture for urban gardeners;
- low rentability of agricultural activities.

OPPORTUNITIES OF URBAN AGRICULTURE

The opportunities for urban agriculture in St Petersburg are many.
The following issues are opportunities and at the same time challenges:
- there are plenty of vacant lands in the city that can be used for small scale agriculture;
- most urban gardeners are optimistic, well-informed, self-trained and skilled;
- many people are active in the field of sustainable and organic agriculture; the urban agriculturist in St Petersburg has never been keen to use chemicals and always preferring manure and compost;
- well-established education at the university level;
- low salaries, limited purchasing power and high market prices of agricultural products force people into self-production;
- growing governmental and municipal interest to support food security, self-employment and small enterprise development for social and political stability reasons.



Organopónicos in Havana, Cuba

During the crises years of the early 1990s when due to the deconstruction of the eastern European bloc, Cuba lost it main trading partners and at the same time the US intensified its economic blockade against Cuba, the black market thrived and food prices skyrocketed. Many food items got "sidetracked" from state distribution chains feeding the black market and causing scarcity in the ration system. Fresh fruits and vegetables, even when produced in ample quantities often rotted in the fields or at warehouses because the transportation system was also in crisis.

Urban Agriculture in Havana (Cuba)

Food production in the community by the community and for the community

Today food is much more available, prices have come down, and quality is up. Per capita figures for fresh fruits and vegetables are recovering. Much of this turn around has been due to a mass movement within all levels of Cuban society to produce and market food, flowers and medicines "in the community, by the community, and for the community" (Fuster, 1999).

Such crises as Cuba experienced in the 1990s are a quiet and everyday crisis around the globe. For the hungry, whether they are in underdeveloped or overdeveloped countries, Cuba is demonstrating to the world that with an appropriate set of policies, resources, and technological innovation hunger and food insecurity need not be the norm for so many families.

THE ROOTS OF THE URBAN AGRICULTURE MOVEMENT

All over the island, agriculture changed in response to the new situation. Without fuel and parts for the tractors or agrochemicals, Cubans began to use sustainable technologies. The urban agriculture movement was born out of this crisis. Although Cuba is highly urbanized, urban agriculture was virtually nonexistent prior to the 1990's. When the crisis came, the urban areas were the hardest hit because it was difficult to transport produce into the cities due to the fuel shortages. As a result people in many communities began to quietly take over empty lots and to farm. Others requested local agencies to let them farm on their open space. Many of the first gardens were planted in side lots, on patios, and on rooftops by urban families who were trying to feed themselves when the store shelves were bare.

The urban agriculture movement was born out of this crisis

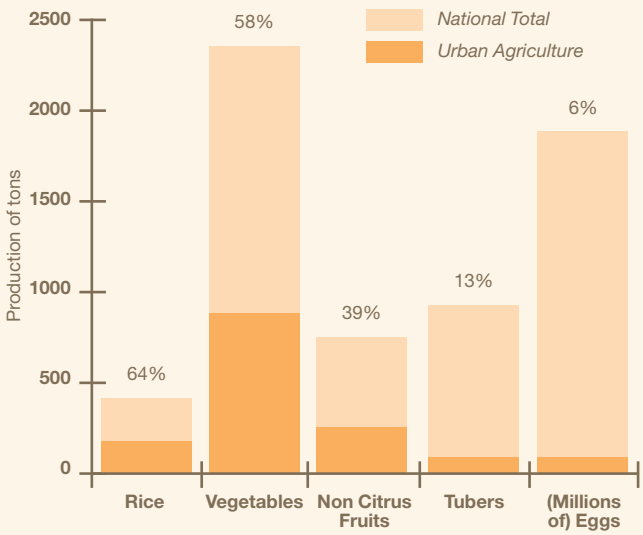


Figure 1 Urban Agriculture as a Percentage of Total Production (MINAGRI, 2000; Cuba News 2000)

Martin Bourque and Kristina Cañizares
Food First/Institute for Food and Development Policy
Oakland, USA

Santa Fe, a small beach community on the western edge of Havana, grew to be one of the leading farming neighborhoods in Havana. By 1995, there were 915 small farms and gardens with 400 gardeners working on them.

As policy makers watched this movement they began to realize its potential. After many visits and interviews in Santa Fe and other successful communities, Urban Agriculture was declared a national priority and was supported by the highest authorities in the country (Gonzalez, 2000). The Ministry of Agriculture created a National Urban Agriculture Program through which significant resources were channeled to support food production in cities and small towns (MINAGRI, 1999)

THE GROWTH OF URBAN AGRICULTURE

The principal challenges for urban farmers and gardeners at that time were *access to land* and a *lack of experience*. In 1993, the Ministry restructured urban land use rights to make it easy for locals to apply for land. Any unused land could be given to a gardener in permanent usufruct ownership- it would remain under his or her control as long as it was under cultivation. Havana blossomed with gardens.

Most urbanites people had little experience with agriculture, and even those with farming backgrounds had little knowledge of the small-scale, organic techniques that were necessary for urban cultivation. The Department of Urban Agriculture coordinated a comprehensive network of extension agents based on Santa Fe and other experiences to assist the gardeners, provide information about the latest technology, and help to distribute seeds and tools. Many independent urban farmers have now formed cooperatives for credit and service (CCS) and new collective farms are being created under the legal umbrella of the Basic Units of Cooperative Production (UBPC) (Companioni et al. 1998).

Compañeros,
For some time I have been insisting on the importance of developing our urban agriculture. I am convinced that these are the first products that we will be self sufficient in and that this will represent an important factor in the gradual solution to the problems of feeding the population.

*-**Raul Castro**, Minister of the Revolutionary Armed Forces, 1998*

Table 1: Extent of Urban Farming in the City of Havana 1997 (after Companioni et al. 1998).

Form of Production	Total Number of Sites	Total Area (ha.)
Intensive Gardens	92 gardens	17.00
Organopónicos	96 gardens	23.80
Hydroponics & Zeoponics	3 locations	111
Suburban Farms	2,138 private farms 285 state farms	7,718
Popular Gardens	5,000 gardens 26,604 gardeners	1,854
Business and Factory Gardens	384 gardens	5,368
Household Gardens	Unknown	Unknown
Total	*7,998 gardens*	*15,092 ha*

The Cuban government wanted to make it easier for farmers to distribute their produce to the population. Previously all food that was bought and sold either went through government stores or was traded on the black market. To prevent this practice and to lower food prices, the government allowed food to be sold at farmer's markets and on-site stands throughout the city (Gonzalez, 2000). Because the food is sold where it is grown, there are no transportation or storage costs, and the food is always fresh. Some gardens have hired neighbours to sell produce on bicycle carts. Many gardens also donate some food to local community centers, schools, elder cares facilities, hospitals, and the like (Murphy, 1999).

The government programmes are successful because they are not static; they change in response to the needs of the producers and consumers. For instance, as the demand for garden inputs grew, the Ministry found that its small stores, or seed houses, would be more efficient if less centralized. Therefore each seed house, which supplies all the necessary garden inputs, is highly autonomous. The Ministry delivers inventory, but does not set the sale prices. This type of negotiated cooperation has provided the flexibility necessary for unprecedented growth and innovation.

A DIVERSITY OF TYPES OF FARMS AND GARDENS

Urban agriculture in Havana takes many forms; gardeners use different methods depending on the size, location, and quality of the lot. The existing forms can be divided up by methods used and by social organization The different types of methods are intensive gardens and patio plots, *organoponicos* and small diversified farms. In the densely populated urban areas where gardens are small (under two hectares), Cubans use either intensive

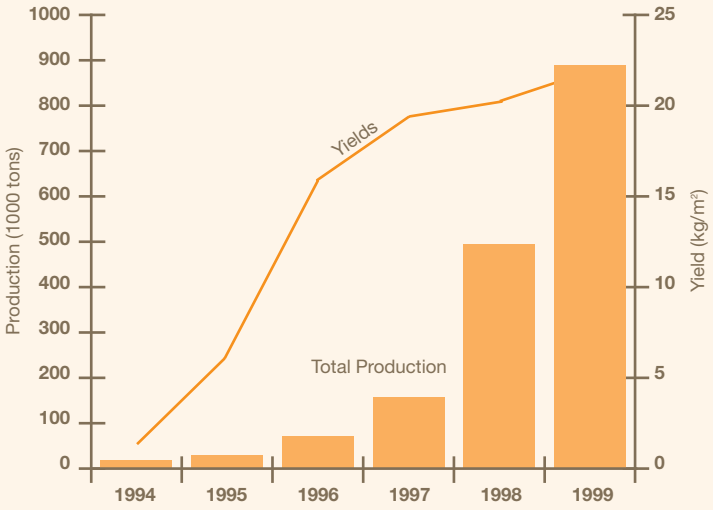


Figure 2: Total Production and Yields of Organoponicos 1994 to 1999. (After Companioni et al., 2000)

gardening or the *organopónico* methods of cultivation. The intensive garden is used where the existing soil is healthy and drainage is adequate, and seeds and seedlings can be planted directly into the existing soil. Raised beds may be created with supports around them to protect against heavy rains and to more efficiently use the organic fertilizer.

In areas where the soil is poor, rocky, compacted, contaminated, or non-existent, especially where drainage is blocked, or on paved lots the *organopónico* method uses raised beds with "imported" soil and compost. The beds are usually constructed out of any handy material, including old roofing tiles and rocks or broken cement blocks. The soil is brought in from the area and mixed with equal amounts of organic material to fill the beds. Both of these systems are extremely intensive. They never try to have the beds unplanted more than 48 hours, and they are all use very high application rates of compost and other organic soil amendments (González, 2000; MINAGRI, 1999; Murphy, 1999).

In the outskirts of the city where more land is available, are the suburban farms exceeding two hectares in size. Because of their larger size, the suburban farms are able to integrate more livestock, fruit and forestry trees in with the horticultural production found in the smaller gardens. These farms are also highly diverse and may produce crops with longer crop cycles that a small farm would see as an inefficient use of limited space. Many of the starchy tubers and grains are produced on these farms.

There are many different ways that urban farms are organized and two main types of land tenure. The farmers who have traditional private parcels are in both urban and suburban areas are called *Parceleros* and are typically organized into credit and service cooperatives (CCSs). Since 1993, when the government began giving out land to individuals in free and permanent usufruct ownership, a new category of farmer was created: The *Usufructuario*. They are increasingly being incorporated into the CCSs. When several farmers come together and form a cooperative and ask for land and loans as a group, they form a Basic Unit of Cooperative Production (UBPC). The state gives them a piece of land (larger than an individual could get) and provides the infrastructure such as fencing, sales kiosk, tool shed, irrigation system, and startup production loans, which the cooperative will pay off over time. The rates are low and the land is free so most are able to pay off their loans before the term is up.

Many state run enterprises have been experimenting with a new arrangement where they break up the large state owned lands surrounding the city and give small plots (up to 20 hectares) to new farmers. They are like *Usufructuarios* in many senses except that they must continue to produce the crops that that enterprise traditionally produced, and sell it exclusively to that enterprise. The contracts are based on production quotas, and the prices are fixed before planting. Anything the farmer produces above and beyond the quota either gets an increased price or can be sold directly to consumers at higher prices.

As a result of the policy, resources, land and market reforms, and dedication of government and community members, the urban agriculture movement has exploded. Figures for number of gardens, area farmed, total production, yield and percentage of total food production demonstrate these trends.

REAPING THE BENEFITS OF URBAN AGRICULTURE

The urban agriculture program has had a fantastic impact on nutrition and food security. Besides vegetables, the urban agriculture programme also produces herbs, medicinal plants, rice, fruits, cooking oils, honey, pigs, chickens, rabbits, and ornamental plants. Specific programs provide irrigation systems, worm composting, and recycling of household wastes. Urban agriculture has provided urban dwellers with a way to grow their own food, and current production is rising so fast that some areas are already producing 30% of their caloric intake.

Urban agriculture activities in Havana takes many forms

Another important impact of urban agriculture was that food prices went down due to the increasing production.

REFERENCES

-Castro, Raul. 1998. Communiqué to the First Secretaries of the provincial committees of the Cuban Communist Party. September 4, 1998.

-Companioni Nelso, Ojeda, Egidio Páez, and Catherine Murphy. 2000. Urban Agriculture in Cuba: Structure and Fundamentals. In Transforming the Cuban Countryside: Advances in sustainable agriculture. Food First Books. Oakland. In Press.

-Companioni, Nelso, Elizabeth Peña, Adolfo Rodriquez, Yanet Ojeda, and Mirian Carrión. 1998. La Agricultura Urbana en Cuba: Su Estructura y Fundamentos Organicos. INIFAT. Havana.

-González, Mario. 2000. Institucionalización de la Agricultura Urbana en la Ciudad de La Habana. A paper presented to the Urban Development Program of the United Nations Development Program. Quito Ecuador, April 2000.

-MINAGRI. 1999. Lineamientos para los Subprogramas de la Agricultura Urbana para el Año 2000. Grupo Nacional de Agricultura Urbana. Havana.

-Murphy, Catherine. 1999. Cultivating Havana: Urban agriculture and food security in the years of crisis. Development Report no 12. Food First / Institute for Food and Development Policy. Oakland.

Questions and answers

RUAF, being a resource centre, regularly receives questions from a variety of persons and institutions on many different subjects. Some of them can be answered directly by RUAF; others are forwarded to partner institutions with the required expertise. Readers are also welcome to contribute and share experiences with others. In the next issue we will start with an interactive Question and Answer section.

Frequently asked questions include the following:

❖ *Information on gardening practices and techniques, like organic farming*
Answers to many of these type of questions can be found on the website of City Farmer: http://www.cityfarmer.org. If not, these questions could be dealt with by other institutions participating in RUAF, or other of the Support Group.

❖ *Information on conferences and other activities*
See the section on Forthcoming Events of the UA Magazine or here, or at http://www.ruaf.org. There you will also find links to other websites that may provide this type of information see the section on Websites.

❖ *How to find certain publications?*
On the Bibliography pages of the RUAF website you may find what you look for. Furthermore, we will regularly review new releases under the section New Publications.

Recent questions received, that were of interest to quite a few of who communicated with RUAF are:

❖ *Where to find information on indicators or models that may assist in calculating the percentage of food security and income delivered by urban agriculture.*
❖ *Information on the qualitative and quantitative impacts of community gardens.*
❖ *Where to find or how to apply for funding for setting up a community garden.*

We invite you to share your experiences with us. You can send your answers, suggestions and questions to:

The editor of UA Magazine:
RUAF: ruaf@etcnl.nl
ETC International
PO Box 64 , 3830 AB Leusden
The Netherlands
tel: + 31 33 4943086
fax: + 31 33 4940791

Next issue

You are invited to contribute to the Urban Agriculture Magazine with an article, description of best (or bad) practices, photo's and information on interesting publications, websites, workshops and training courses.

An article-contribution, should highlight the urban aspects and policy implications and recommendations. Articles should be written in such a way that they can be readily understood by those working with farmers. We would like to suggest articles of up to 3000 words long (This is about 6 pages A4). Articles should preferably be accompanied by an abstract, illustrations (digital if possible) and references. The planning for the next issues is:

No. 2 *Urban Livestock* (October 2000)
No. 3 *Integration of urban agriculture in urban planning* (January 2001)
No. 4 *Management of urban agriculture related health aspects* (April 2001)
No. 5 *Methodologies in planning and facilitation of urban agriculture* (September 2001)
No. 6 *Urban agriculture and food security* (December 2001)

RUAF is a global initiative of the Support Group on Urban Agriculture, co-ordinated by ETC

Colofon

Urban Agriculture Magazine
Volume 1, No 1
June 2000

The *UA-Magazine* is published by the Resource Centre for Urban Agriculture (RUAF), a Programme executed by ETC Netherlands and financed by DGIS, The Netherlands and IDRC, Canada.

The *UA-Magazine* is published 3 times a year.

In the future the *UA-Magazine* will also be published in French and Spanish, and distributed through regional institutions.

The *UA-Magazine* is also published on the RUAF website: www.ruaf.org.

Address
RUAF, P.O. Box 64,
3830 AB Leusden,
The Netherlands,
Visitors address:
Kastanjelaan 5, Leusden.

Tel: +31.33.4943086
Fax: +31.33.4940791
Email: ruaf@etcnl.nl
Website: www.ruaf.org

Editorial
This Issue has been compiled by Henk de Zeeuw (guest editor) and René van Veenhuizen (responsible editor)

Photographs
Except for the article of Ahmedabad (photo's by L. Marulanda), photo's available with RUAF have been used, of the following sources: C. Schilter (Togo), B. Mbiba (Zimbabwe), T. Pinzas (Peru), P. Jacobi (Tanzania), F. Nunan (India), L.M. Sanchez (México), M. Amar-Klemesu (Ghana), PUVPP Project (Phillippines), Ciudad de Havana (Cuba).

Administration
Bernie Coenders

Subscriptions
The editor
ruaf@etcnl.nl

Design and Layout
Jan Hiensch, Leusden

Language Editor
Amunda N. Salm

Printing
Koninklijke BDU, Barneveld

www.ruaf.org