URBAN AGRICULTURE MAGAZINE
SPECIAL EDITION
World Food Summit five years later

Poor urban consumers can spend from 60 to 80% of their limited income on food

FAO

Enhancing the Contribution of Urban Agriculture to Food Security

At the World Food Summit in 1996, representatives of 185 nations and the European Community pledged to eradicate hunger in all countries, with an immediate view to halving the number of undernourished people by 2015. Five years later it is estimated that hunger still afflicts one in five of the developing world's people and that nearly 30 percent of the world's population suffer from some form of malnutrition. An increasing part of these people live in urban areas. Rates of urbanisation are expected to reach 83% in Latin America and the Caribbean, 53% for Asia and the Pacific and 55% for Africa by 2030. Ensuring food security and appropriate nutrition of the urban population - and in particular of the poorest households – has become a major challenge world-wide.

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Clearly cities vary in terms of constraints and opportunities linked to their size, evolution, geographical location and socio-economic context. While poverty and destitution can be found in all cities, estimated poverty rates in the developing world's cities often exceed 50%. Poor urban consumers can spend from 60 to 80% of their limited income on food. Traditional food habits shift towards urban models using more "modern", ready-to-use and affordable foods. Food insecurity and inadequate food practices combined with unhealthy living conditions lead to high prevalence of malnutrition, where under- and over-nutrition, frequently accompanied by micronutrient deficiencies, increasingly co-exist. This in turn has a negative impact on urban development by diminishing people's capacity to work and diverting resources to health care.

Urban and peri urban Agriculture is practised in varying degrees in both developing and developed countries worldwide. It includes both commercial agriculture (thus contributing to overall urban food availability, in particular of fresh and perishable plant and animal foods rich in micronutrients), and food production for home consumption. It can therefore generate income (all along the food chain and in particular in the informal sector), reduce household expenditure on food and contribute to the diet, thus contributing to food security of the

In this issue

urban population, as consumers and as producers. On the other hand, inappropriate use of agricultural inputs such as pesticides, use of contaminated water for irrigation and spreading of breeding sites for disease vectors can have negative impacts on health and in particular food safety.

Agricultural production in and around cities appears to expand during economic crises: in the case of armed conflicts, it helps supply cities cut off from their traditional food production sites and contributes to the livelihoods of Internally Displaced People fleeing the combat zones; in times of economic crisis, rising prices and high unemployment, it is a means for impoverished households to feed themselves.

Urban and peri urban agriculture should certainly not be seen and promoted as "the" answer to urban food insecurity and malnutrition. However, the mere fact that people opt for this activity indicates that it is either a stable component of their livelihoods or a temporary coping-strategy in periods of economic or political crisis and impoverishment. Urban authorities should be aware of the benefits and potential risks of such activities and assist urban farmers in producing safe and nutrient-rich products for both home consumption and city markets. This will require a good understanding of existing and potential relationships between urban and peri-urban agriculture and nutrition in a given city, in order to enhance the positive impacts on household food security and nutrition and minimise or mitigate health and environmental risks.

Collaboration of institutions from different sectors including policy makers, technical staff from both government and NGOs (including Community-Based Organisations), the private sector and researchers will be needed to work both from the food supply and demand angles. The organisation of urban farmers is needed to facilitate sustainable access to productive resources (land, water, agriculture inputs, credit), information and training. Quality control from production to consumption is essential both to ensure food safety for urban consumers and to help producers obtain better prices. However appropriate nutrition information, education and training for consumers, producers and other stakeholders will be equally important to ensure that the foods produced effectively contribute to good nutrition and health.

Municipalities, assisted by relevant line ministries, have a lead role to play as facilitators and coordinators of this interdisciplinary approach. Urban policies and planning should encompass the needs and benefits of urban agriculture- while ensuring year round availability of varied, safe and affordable foods from rural areas, urban areas and complementary food imports -, take into account rural-urban linkages (in terms of comparative advantages, seasonality and livelihoods), identify and provide specific attention to the needs of poor households and involve the different stakeholders.

In June 2002, FAO will host again a global meeting of world leaders, the World Food Summit: five years later. This meeting aims to review progress in achieving the goals adopted by the World Food Summit and to give new impetus to world wide efforts on behalf of hungry people. Hunger is both a violation of human dignity and an obstacle to social, political and economic progress. The cost of not eradicating hunger, the most extreme manifestation of poverty, in terms of conflict, recurrent emergencies, crime, disease and premature death, is enormous. This is particularly true in urban areas. The task will not be easy in view of the combination of accelerating urbanisation, changing economic order, persistent conflicts and epidemics such as HIV/AIDS. It will need the involvement and collaboration of all.

This special issue of the Urban Agriculture Magazine discusses major issues and provides information on agricultural production in a number of cities in the world. It calls for seeing urban agriculture as an important strategy for enhancing urban food security. We are looking forward to collaborating with mayors, urban institutions and partner organisations in the necessary alliance against hunger and we hope that participants at the World Food Summit: five years later will provide us with the necessary guidance and encouragement.

Min. of Information, Accra

Mr. Martin Kumah (right) receiving the award for the 'Best Metropolitan Farmer' from the Mayor of Kumati, Ghana

Watering crops on a roof in Dakar, Senegal

From Video "Urban Agriculture", RUAF 2001

Urban agriculture can be defined as the growing of plants and raising of animals for food and other uses within cities and peri-urban areas, as well as related activities like the production and delivery of inputs and the processing and marketing of products.

Urban Agriculture

A complementary strategy to achieve urban food security

Urban agriculture is a dynamic phenomenon that comprises a large variety of farming systems, a high degree of flexibility and adaptability, and serves various functions. Next to food security, one should mention its potential contribution to local economic and micro-enterprise development, poverty alleviation and inclusion of the poor, the productive reuse of urban organic wastes and wastewater, the greening of the city and maintenance of its biodiversity, among others. Mougeot, in his contribution on page 6 of this special issue of the *Urban Agriculture Magazine*, provides an overview of the main conceptual aspects of urban agriculture, and arrives at a definition that stresses that urban agriculture is an integral part of the urban system - its food system, its economic system and its ecological system.

In this issue, we will focus on the aspects of food security and nutrition only.

URBAN AGRICULTURE ON THE POLICY AGENDA

The World Food Summit: five years later in June 2002, will reassess the targets and strategies which were set five years ago and discuss the way forward. One of the issues, which was not high on the agenda in Rome five years ago, is that of locally based solutions to food insecurity in the cities including food production in urban areas (i.e., urban agriculture).

Urban agriculture has received international attention since the eighties (UNU, UNICEF), but more so since the early nineties. A special role is being played by the Support Group on Urban Agriculture (SGUA) in which a large number of international support organisations exchange experiences and coordinate their activities (see also at the back of this issue).

The Committee on Agriculture of the United Nations Food and Agriculture Organisation discussed and accepted a policy paper on Urban Agriculture during a meeting in November 1997. The electronic conference on "Urban Agriculture on the policy agenda", jointly organised by ETC-RUAF and FAO, is one of the many activities that have been developed by the FAO and other international support organisations since then.

A rapidly growing number of national and local governments have recognised the contribution urban agriculture can provide to counteract the growing urban food insecurity (see for instance the Quito Declaration on Urban Agriculture by the Latin American Cities Network).

This special edition of the *Urban Agriculture Magazine* has been prepared with the purpose to call attention to urban agriculture as an important strategy for enhancing urban food security. It consists of two articles previously published in the *Urban Agriculture Magazine* and a series of case studies summarised from the book *Growing Cities, Growing Food* published by DSE and compiled by ETC and GTZ. This issue also contains a Fact Sheet with a brief overview of key data on the presence of urban agriculture and its impacts on urban food production, consumption and nutrition.

It is hoped that the publication of this special issue will lead to more prominent attention to urban agriculture as one strategy towards the eradication of hunger.

URBAN FOOD INSECURITY RISING

It has been estimated (Garrett 2000) that in 20 years time, the number of people living in developing countries will grow from 4.9 to 6.8 billion. Ninety percent of this increase will occur in expanding cities and towns. It is thus foreseen that in 2020, more than half of the population of

Rachel Slater

Thobeka growing cabbages in Langa, South Africa

Africa and Asia will live in urban areas. The number of cities in the developing world with more than one million residents is expected to reach 400, including several in China.

With an ever-growing number of people seeking a livelihood in cities, poverty is most likely to increase as a consequence. The developing world's absolute poor living in urban areas has doubled only in two decades, to about 650 million people. The World Bank (2000) estimates that approximately 50% of the poor now live in urban areas (as compared to 25% in 1988).

Most cities in developing countries are not able to generate sufficient (formal or informal) income opportunities for the quickly growing population. In urban settings, lack of income translates directly into lack of food since families of poor city dwellers spend between 50 and 70% or more of their income on food.

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 reductions in public expenditures. It is expected that the costs of supplying and distributing food from rural areas to urban areas or to import food from abroad will continue to increase (Argenti 2000).

FOOD PRODUCTION IN AND AROUND THE CITY

Against this background it is understandable that food production in the city is in many cases a response of the urban poor to inadequate, unreliable and irregular access to food and lack of purchasing power. Growing food, herbs, medicinal plants, and raising animals in backyards, along riversides and railways, on office grounds, and plots in peri-urban areas, and so on, provide people with fresh food, savings on food expenditures and income from the sale of production.

Urban agriculture also enhances food security of the non-producing urban poor, since it improves their access to food (shorter distances), at lower prices (less transport, less packaging, less intermediates) and improves the quality of their diet (more fresh and green food).

But in most cities, one will also encounter a large variety of small and larger enterprises engaged in the production of food (vegetables, mushrooms, eggs, poultry and pork, milk, fish, etc.) and non-food products (ornamental plants, tree seedlings, flowers, tree products) for the market. Furthermore, one finds micro and meso-enterprises involved in the production of inputs for intra- and peri-urban producers (e.g. compost), as well as the processing and marketing of agricultural products.

The above indicates that economic or food crises are not the main driving factor behind the upsurge of urban agriculture. There are numerous cities where urban agriculture has developed without having experienced a special crisis period. Urban agriculture is and always has been an integral part of the urban food system, and is likely to remain so in the future (Mougeot 2000).

Selected research data on the presence of urban agriculture and its impact on urban food security and nutrition are given on pages 8 and 9.

CONSTRAINTS FOR URBAN AGRICULTURE

Urban agriculture, just like rural agriculture, needs proper management and support and without this can have negative impacts on people and the environment. The risks generally associated with agricultural production in the city are:

- using high quantities of chemical fertilisers and pesticides may cause groundwater or crop pollution;
- use of untreated wastewater for irrigation may lead to the contamination of crops and negative impacts on the health of the farm workers;
- growing irrigated rice, or some other crops on furrows, creates the risk of spreading malaria (Africa only); and
- keeping animals (especially pigs) under poor environmental conditions and close to humans may cause human health risks (like zoonoses).

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In the past, the fear of negative health impacts has in many cities led to the imposition of generic and restrictive policies on urban agriculture. However, nowadays, more and more cities realise that such policies are bound to be ineffective. The tendency of local governments now is to formulate more diversified and regulatory policies that seek to actively manage the health and other risks through an integrated package of measures, with the involvement of the direct stakeholders in the analysis of problems and development of workable solutions (see also the *UA-Magazine* 1(4), July 2001).

FACILITATING SUSTAINABLE URBAN AGRICULTURE

Constraints to the development of urban agriculture are many. Some of the most important ones are:

- Limited access to productive resources (land, water) and insecure land tenure;
- Lack of support services (training and extension, credit, marketing support and micro-enterprise development);
- Lack of appropriate technologies for the urban conditions; and
- Prohibitive urban policies and regulations. In many cities, agriculture still has an "illegal" status, which creates opportunities for local officials and the police to levy "informal taxes", unpredictable changes in the degree of tolerance, and frequent harassment of urban farmers;
- Lack of organisation among urban farmers and/or lack of cluster and chain development.

There are many options for national and local governments to facilitate and regulate urban agriculture. The article on page 10 in this issue presents a series of policy measures that were recommended by the international experts participating in the workshop "Growing Cities, Growing Food" held in Cuba, 1999.

City authorities can play a key role by creating a platform on urban food policy issues, including urban agriculture. The platform would bring together all direct and indirect stakeholders and act as the main coordination and planning mechanism. The platform would guide the appraisal of the urban food system in general and of the existing farming systems in and around the city in particular. This, in order to develop a comprehensive city food security plan, to stimulate the integration of urban agriculture into urban zoning and development plans, to advise on the revision of city by-laws regarding urban agriculture and to coordinate the planning and implementation of action programmes.

At the international level, governmental and non-governmental organisations could be active in networking and lobbying. In this regard, the work of programmes and initiatives such as the Support Group for Urban Agriculture (SGUA), the Cities Feeding People Programme of the IDRC, the ETC-

Youth in Lima, Peru learning about gardening at school

Resource Centre for Urban Agriculture and Forestry (RUAF), the Urban Management Programme (UNCHS-UNDP), the Strategic Initiative on Urban and Peri-urban Agriculture (SIUPA) of the CGIAR system and the FAO' s Food for the Cities interdepartmental working group, are important examples (see also on the back of this special issue).

From pages 8 and 9

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Urban Agriculture **Main Concepts**

Urban Agriculture in Lomé, Togo

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

This article is a shortened version of the article published in Bakker et al. 2000, Growing Cities Growing Food, and in the UA-Magazine no.1 June 2000.

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In fact, urban agriculture is growing out of its ability to assist, resolve or cope with diverse development challenges. It is spurred by a complex web of factors still little understood, not least of which are urban poverty and food insecurity. In this short contribution, a common agreed concept is proposed, while the author further reflects on suggestions for action and the main actors who should be involved. Possible action to foster urban agriculture is further elaborated in the next article on policy development.

A common agreed concept of urban agriculture is a necessity, 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

The expression Urban Agriculture (UA), or "Intra- and Peri-Urban Agriculture" (UPA), originally only used 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 use to intervene.

With e*xternal 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 for users to 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:

- types of **economic activities**;
- food/non-food categories of **products** and subcategories;
- intra-urban and peri-urban character of **location**;
- 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 terms of 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, etc.) 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, suburban 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 of residence (on-plot or off-plot), development status of site (built-up versus 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.).

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 has recently 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.

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. 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 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.

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.

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.

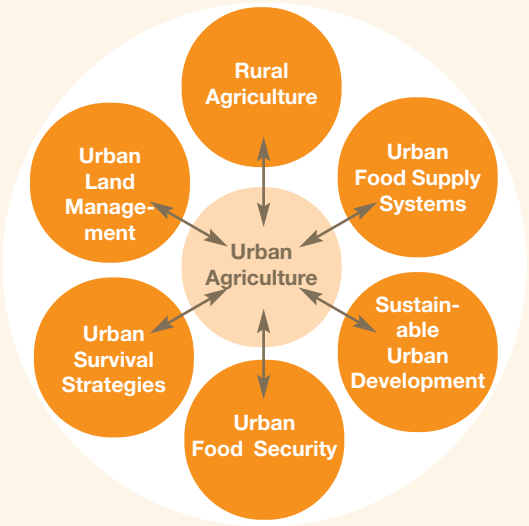

Figure: Urban Agriculture in relation to other issues

Because UA 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.

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Fact sheet on Urban Agriculture,

PRESENCE AND OUTPUT OF URBAN AGRICULTURE

The scale of urban agricultural production in the world is far above common perceptions. It has been estimated (Smit et.al, 1996) that, in 1993, 15-20% of the world's food was produced in urban areas, and that this percentage is on the increase. They further estimated that 800 million people are engaged in urban agriculture worldwide. Of these, 200 million are considered to be producing for the market, employing 150 million people full time.

Smit et.al, 1996, present the following overview of data regarding the participation of urban households in agriculture (including part timers):

Percentage of urban families is involved in urban agriculture

Ouagadougou: 36 %; Yaounde: 35 %; Maputo: 37%; Lusaka: 45%; Kampala: 35%; Dar es Salaam: 37%; Lusaka: 45%. The large majority of the urban farmers in these cities are women (65% in average).

In **Cairo**, Egypt 16% of households (30% in slums) keep small animals (Gertel and Samir, 2000).

In **Amman**, Jordan, 22 % of the surveyed households practice agriculture, both livestock and horticulture, (Department of Statistics, 2002).

Agriculture occcupies about 16% of the total urban areas of **Santiago de los Caballeros** in the Dominican Republic, and is the third most important soil use after residential and vacant land use (Acevedo Abinader, 2001).

The gardens of **Havana**, Cuba, produce a vast array of fruits, vegetables and tuber crops, using methods similar to organic farming. Approximately 18,000 individuals are involved and produced 25,000 tonnes of food in1999 (Gonzalez, 1999).

In **Dar Es Salaam**, Tanzania, urban agriculture is the largest land user (23 percent of city region; 34.000 hectares under crops) and the second largest employer (20 percent of those employed), with an estimated annual gross output (1991) of 27.4 million USD. The individual urban farmer's annual average profit was estimated at 1.6 the annual minimum salary (Sawio, 1998). In 1985, 3318 heads of cattle were counted within the city boundaries in1985, 7105 in 1988 and 9081 in 1993 (Jacobi et al. 2000). Urban fresh milk production in 1993 was worth an estimated at USD 7 million (Mougeot, 1994). More than 90 percent of leafy vegetables coming to the markets have their origin in the urban open spaces and home gardens (Stevenson et al., 1996).

In **Accra**, Ghana, 90% of the city's fresh vegetable consumption is from production within the city (Cencosad, 1994). Nearly 30% of low-income households in informal housing, had livestock worth on average nearly a full month of income (GTZ, 2000).

The Niayes zone around **Dakar**, Senegal, which constitutes 3% of Senegal's land surface produces nearly 80% of vegetables in Senegal, whilst poultry production amounts to over 65 % of the national demand (Mbaye and Moustier, 2000).

In **Nairobi**, Kenya 50% total food consumption of low-income households, produced within the city (Foeken and Mwangi, 2000). Urban agriculture provides the highest self-employment earnings in small-scale enterprises and the third highest earnings in all of urban Kenya (House et al., 1993).

In **Lomé**, Togo, the mean monthly income of a market gardener was found to equal ten minimum salaries or that of a senior public servant. Cost-benefit analysis of market-oriented productions, such as vegetable crops, have shown net incomes to largely depend on low-input practices and low-overhead cost (Abutiate, 1995); profit margins are high where sales are less middle-manned.

In **Harare**, Zimbabwe, between 1990 and 1994, the open space cultivation doubled its area, to some 16% of the city's area. More than 20.000 farmers in the city of Harare have harvested good yields, and will not be affected by the lack of maize in the city, due to the current economic problems in Zimbabwe (Mbiba, 2000). Savings accruing to small-scale urban farmers are equivalent on average was ZW$264, or slightly more than one-half month salary. Farmers sold only a small amount of their output (5 percent in 1994 and 9 percent in 1995).

In **Lusaka**, Zambia various surveys show a high increase of maize and vegetable production in the city of Lusaka. Drescher found in 1994 that of the sample of 648, nearly 50% of the women and about 35% of the men had rain season gardens where they planted maize (staple food).

In **Shanghai**, China, 60% of vegetables, more than half pork and poultry, and more than 90% of milk and eggs originate from urban and peri-urban areas." (Yi-Zhang and Zhangen, 2000).

Hong Kong, China, the densest large city in the world, produces within its boundaries 45% of fresh vegetables , 68% of live poultry, 15% of the pigs and 45% of the vegetable consumed by its citizens. (Smit et.al, 1996).

Food Security and Nutrition

Singapore is fully self reliant in meat. It further produces 25% of its vegetables it consumes. Singapore licenses many farmers, some of which high-tech farmers, but houses many more unlicensed small-scale producers (Smit et.al, 1996)

In **Jakarta**, Indonesia, 10% of vegetables, 16% of fruit and 2 % of the total need of rice in the city is produced between its city limits (Purnomohadi, 2000).

In **Hanoi**, Vietnam it is estimated that 80% of fresh vegetables, 50% of pork, poultry and fresh water fish, as well as 40 % of eggs, originate from urban and peri urban areas. (GTZ, 2000)

In **Kathmandu**, Nepal, 37% of households raise horticulture crops and 11 % raise animals; urban farming provides 30% of vegetable consumption (Smit et.al, 1996)

Karachi, Pakistan urban farming provides 50% (Smit et.al, 1996).

In **La Paz**, Bolivia, on a total of 2950 ha of land, more than 30% of the consumption of "easily perishable crops" (vegetables) is grown (Kreinecker, 2000).

In **Mexico City**, 54 percent of the owners of agricultural land *within the city* produce food for their own consumption; while 28 percent produce food to sell in the market, and the remainder do not actively produce anything on their land. Nonetheless, the quantity of food produced on any of these plots is not sufficient to cover basic requirements for a family (GTZ, 2000). Conversely the commercial agriculture in Mexico City's *peri urban* area contributes substantially to the local economy.

IMPACTS ON NUTRITIONAL STATUS

The above indicates quite clearly that presence and output of urban agriculture is substantial, but what evidence is available that the urban produce food improves the nutritional status of the urban poor?

Few rigorous analyses are available on the nutritional impacts of urban agriculture on self-producing households; However, findings from these studies are encouraging: all found that self-producing households achieved greater food security, particularly with regards to nutritional status measured by caloric and protein intake and anthropometric measurements (stunting, wasting) as compared to non-farming urban households.

Self-production represents anywhere from 18 percent (East Jakarta) to 60 percent (Harare) of total food consumption in low-income households, with sample percentages depending solely on self-production reaching 50 percent (Nairobi).

In **Harare** households involved in urban farming had more nutritious breakfasts and consumed more protein-rich food over longer periods of the year than non-farming households (ENDA, 1997). Urban agriculture provides poor households in Harare with staple meal lasting up to four months in a year (Mbiba, 1993). Sixty percent of food consumed by (a quarter of) the low-income group was self-produced (Bowyer-Bower and Drakakis-Smith, 1996).

In **Kampala**, Uganda, children aged five years or less in low-income farming households were found to be significantly better off nutritionally (less stunted) than counterparts in non-farming households (Maxwell, 1999). Urban producers obtained 40 to 60 percent or more of their household food needs from their own urban garden.

In **Nairobi** it was found that average energy and protein intake was higher in the farming groups than in non-farming group and percentages of malnourished, wasted and stunted children were much lower. The farming households produce between 20 percent and 25 percent of their food requirements, and are significantly less dependent on gifts and transfers (Foeken and Mwangi, 2000)

In **Lusaka**, low-income households in the period 1986/87 obtained one-third of their total food consumption from urban gardening (Mbiba, 1993).

In 1998, the urban farmers of **St. Petersburg**, Russia, produced more apples, pears and plums, vegetables, strawberries and cut flowers than all the agricultural farms of the Leningrad Region (Maydachenko, 1999).

In **Ouagadougou**, Burkina Faso, Gerstl et al. (2002) came to the conclusion that at least for half of the year, quantity, quality and type of food is improved for especially the lower socio-economic classes at no to little cost.

In **Jakarta**, 18% of total food consumption of low-income households is produced within the city (Purnomohadi, 2000).

In **Cagayan de Oro**, The Philippines, urban farmers eat generally more vegetables than non-urban farmers of the same wealth class and also more than consumers from a higher wealth-class (who consume more meat) (Potutan et al., 1999)

In **Addis Ababa**, Ethiopia, Getachew gives the following data to give the potential of urban agriculture in Addis Ababa: 70% of the city solid waste is household organic waste; 60.000 cows produce 44M litres of milk per year (satisfying only 5% of demand), while 70% of the 12 million kg. Of vegetables and fruits is produced within the city (Getachew 2002).

See references on page 5

Women selling maize in Harare

Beacon Mbiba

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 and imported food is insufficient. It is necessary for cities to develop plans to enhance urban and peri-urban food production, and to diversify away from the present reliance on the highly capitalised and energy-consuming "supermarket" model, based on the external supply of food-stuffs (Dahlberg 1998).

Policy Measures

to facilitate urban agriculture and enhance urban food security

This article is an adapted and shortened version of the article by De Zeeuw, Gündel and Waibel that has been published in Bakker et.al, 2000, Growing Cities Growing Food, and in the UA-Magazine no.1, June 2000

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In this article, a range of potential policy measures will be presented, which were identified by the experts participating in the International Workshop "Growing Cities, Growing Food" held in Cuba, 1999 as suitable policy measures regarding urban agriculture in response to growing urban poverty and food insecurity.

It is clear that such recommendations are of a general nature and will have to be refined according to specific local conditions. The variety of local conditions for and the diversity of types of urban agriculture indicate the importance of a careful analysis of the local context, and carefully designed and differentiated policy measures and action programmes for urban agriculture.

CREATING AN ENABLING POLICY ENVIRONMENT

Historically urban agriculture does not have an institutional home. Organisations like the Ministry of Agriculture usually lack a political mandate for urban agriculture whilst urban authorities and planners rarely have integrated agriculture in urban development planning. Awareness among policymakers of the potentials (and risks) of urban agriculture is generally low.

Urban agriculture is a cross cutting issue, requiring a multi-sectoral approach. However, in many countries there are no mechanisms in place that facilitate such co-ordination between sectoral departments and between municipal authorities, NGO's, groups of urban farmers and other stakeholders in urban food production and consumption.

Moreover, farmers are often poorly organised and lack channels to voice their needs and lack the power to participate in policy preparation and city planning processes.

To improve this situation, the following measures are recommended:

a. At national level

The selection of a *national lead agency on urban agriculture* and the establishment of *an interdepartmental committee on urban food production and consumption would create an institutional home for urban agriculture*. The national lead agency and the interdepartmental committee will stimulate development of an appropriate legal framework for urban agriculture, facilitate the creation of a national urban agriculture programme with local pilot projects, and support local initiatives for the integration of urban agriculture in city planning and urban development policies.

The organisation of *on site meetings and policy seminars* will raise awareness among national and city administrators, planners and NGOs and will provide them with reliable data and positive examples ("best practices"), and will be instrumental in developing an integrated perspective on urban agriculture and correcting common prejudices;

National government also should stimulate *participatory, site specific and interdisciplinary field research on urban agriculture* with a strong policy and action orientation

The *documentation and exchange of experiences* gained with the implementation of various policies and action programmes on urban food production and consumption through workshops, exchange visits, newsletters, etc.

Also the establishment of a *database on urban agriculture* with information on successful policies and projects, appropriate technologies for urban agriculture, effective and participatory planning and research methodologies, available expertise, would e very instrumental.

b. At Municipal level

The setting up of a C*ity Working group on urban food production and consumption* involving all direct and indirect stakeholders in urban food production and consumption has proven to be a very crucial step in various cities. The working group will function as a platform for dialogue and consensus building and will stimulate and co-ordinate the analysis of the present situation regarding urban food production and consumption in the city, guide the development of an appropriate legal framework for urban agriculture, facilitate the participatory planning and implementation of action programmes and facilitate the integration of urban agriculture in city planning and urban development policies.

Legitimating of urban agriculture is one of the first measures that will be needed. Urban agriculture has to be accepted as a legitimate form of urban land use. Review of existing policies and bylaws is necessary in order to identify and remove unsubstantiated legal restrictions on urban agriculture.

SECURING ACCESS TO LAND AND WATER FOR AGRICULTURE IN AND AROUND THE CITY

Access to land and 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 the 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.

In order to enhance access to land and land use security it is crucial *to integrate urban agriculture in urban development and land use planning*. It is recommended that actual urban zoning bylaws are revised and urban agriculture is integrated in zonification plans. Other positive measures are:

- To realise an inventory of open spaces in the city (eg by using GIS) and provision of provision of medium term land leases to poor urban farmers for temporal use of vacant or degenerated public and semi-public lands
- The inclusion of space for individual or community gardens in new public housing projects and private building schemes.
- Promotion of multifunctional land use (flood plain/agriculture; agriculture/recreation; agroforestry and erosion management of riversides and slopes; agriculture/maintenenance of buffer zones and reserve areas)

In many cities urban farmers have equal or more problems with access to water and nutrients (at affordable prices) as with access to lands. Therefore the *promotion of safe re-use of urban organic wastes and wastewater by urban farmers is a recommendable 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. By recycling these urban wastes and their re-use in urban agriculture not only farmers' problems are lessened, but also the city waste problems will be reduced. In several cities treated or untreated wastewater to irrigate woodlands, orchards, pastures, grain crops, and for production of fish and fodder in waste water treatment ponds.

APPROPRIATE TECHNOLOGY DEVELOPMENT AND FARMER EDUCATION

Agricultural research has -until recently- given relatively little attention to agriculture in the urban environment. This while the demand for adapted research is high. The urban conditions require other technologies than are used in the rural context. Urban agriculture tends to be very intensive, space confined with a tendency to specialisation in one or few products (e.g. mushrooms, ornamental plants, herbs, poultry, etcetera). The closeness to the urban population and need to reduce health and environmental risks, lead to a high demand for ecological farming techniques, research into safe re-use of waste water and adequate crop choices and irrigation techniques, to mention just a few examples.

Next to production technologies also attention should be given to improvement of technologies in inputs production (e.g compost production) and in processing and packaging of the products which in urban agriculture are much more knitted with the primary production than in rural agriculture.

It is recommended to stimulate agricultural research in urban and peri-urban farming with active involvement of the urban farmers and other micro-entrepreneurs in the technology development and evaluation process.

The access of urban farmers to applied agricultural research, technical assistance and training and extension services in most cities is still very restricted. If it exists, it is in most cases directed mainly to the larger scale more capital intensive and fully commercial farmers. Consequently, the re is a vast potential for improvement of the efficiency in urban farming, which tends to be highly dynamic, but normally restrained due to its limited access to training and extension services.

Sectoral organisations, NGO's, farmer cooperatives and private enterprises should be stimulated to provide training and technical advice to urban farmers, with a strong emphasis on ecological farming practices. Cost-sharing systems (farmers, municipality, sectoral organisations, private enterprise) will be needed to ensure sustainability of the extension system.

Branko Cavric

Training of urban planners

One of the drawbacks of urban agriculture is the potential negative health effects or farming in the city. For an overview see Birkley and Kock (1998). City authorities will have to develop and implement policies that minimise health risks without compromising the food

security needs of the urban poor and recognise the existence of urban agriculture as more than just a temporary crisis phenomena. Three important measures to minimise health risks are:

a. *Creating awareness among farmers of health risks associated with urban agriculture*

Health risks associated with urban farming can be reduced substantially if farmers are well aware of these risks and know how to prevent them. Farmers should receive information on proper selection of crops and animals and production techniques (especially irrigation techniques) in harmony with the local production conditions

b. *Promotion of Ecological Farming Methods*

The risks of contamination of crops or groundwater with and Prevention of Accumulation of Manure and Crop Residues by Promotion of On-Farm Composting and Recycling

c. *Crop restrictions in sensible areas*

(eg. in areas where untreated waste water is applied the production of green leafy vegetables should be prohibited; no pig rearing in areas where underground water or other drinking water sources may become contaminated). Such measures make only sense if an effective control system is installed and effective sanctions are applied.

Lena Jarlov

Inhabitants in a peri-urban squatter camp are planning to develop a settlement with agriculture. Joe Slovo Settlement, Port Elizabeth

Transporting vegetables to the market

Kai Weise

STRENGTHENING OF LOCAL SYSTEMS FOR PROCESSING AND MARKETING OF AGRICULTURAL PRODUCTS

Various local governments have started programmes to facilitate the local marketing of fresh urban grown food, by:

- *Authorising farmer markets, food-box schemes, consumer supported agriculture (CSA) and other forms of direct selling of fresh agricultural produce* from urban and peri-urban producers to consumers (under conditions of safe-food handling requirements and control of product quality) and *promotion of the development of market infrastructure* for local marketing of urban and peri-urban produced food.
- *Strengthening small scale enterprises linked with urban agriculture*, i.e., input suppliers (compost production, plant nurseries, vermiculture, local seed production, fodder distribution) and enterprises for processing and marketing of locally produced food (processing, packaging, street vending, local markets, transport), by provision of licences to starting micro-entrepreneurs, provision of technical and management assistance and support to the creation of local infrastructure for small scale food preservation and storage facilities (i.e., canning, bottling, pickling, drying, smoking) as well as improved access of these entrepreneurs to appropriate forms of credit.
- *Promoting the production and supply of ecological friendly inputs* like natural fertilisers, bio-pesticides, soil amendments and quality seeds, agricultural, bio-medicaments, agricultural tools, a/o by providing incentives (e.g. tax reduction) for enterprises that produce ecological friendly inputs and/or facilitating the distribution of such inputs through a network of local stores and improvement of the transportation of organic materials and manure from the source to crop farmers.
- *Establishment of a quality control system and quality label for safe urban produced food.*

STRENGTHENING FARMER ORGANISATION

Stimulation of the organisation of urban farmers into *functional groups* (e.g. producers' organisations, marketing co-operatives, machinery pools) is a crucial policy measure that will create better conditions for pursuing their interests and their participation in the planning and implementation of action programmes.

Also the strengthening of the *linkages* and co-operation between urban farmer groups and private entreprises, sectoral support organisations, NGOs, consumer organisations a/o is of crucial importance for sustainable development of the sector. Nor the urban farmers, nor the City authority, nor an NGO or other support organisation by themselves are capable of formulating and implementing a viable strategy fore urban food production and consumption just by themselves. Only by sustained concerted action of the direct and indirect stakeholders, each contributing with their own knowledge and resources, an effective strategy can be realised.

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Due to the deconstruction of the Eastern Bloc and the US economic blockade against Cuba, the Cuban diet, which had long been well above international minimum standards, dropped to 65% of the recommended daily caloric intake, 60% of recommended protein and 50% of recommended fats by 1994. All over the island, agriculture changed in response to the new situation.
Although Cuba is highly urbanised, urban agriculture was virtually nonexistent prior to the 1990s. When the crisis came, the urban areas were hit hardest because it was difficult to transport agricultural produce into the cities due to the fuel shortages. In many communities people began to quietly take over empty lots and farms, while others requested local agencies to let them farm on their open spaces. Many of the first gardens were planted in side lots, on patios, and on rooftops. Today, much more food is available, prices have dropped, and quality has gone up.


Novo González

Organopónicos in Havana, Cuba

CUBA Ciudad de la Habana

The Cuban transformation is a perfect example of how quickly and effectively supportive government policies encouraged urban agriculture. The government programmes are successful because they are not static; they change in response to the needs of producers and consumers.

In Cuba, 80% of the population lives in urban areas, and 20% of the total population lives in the capital, La Habana (2000). This city requires the largest possible supply of fresh vegetables, fruits and other agricultural products. An integrated system organised by the municipalities, popular councils, research institutions, extension and service networks, among others. The basic strategy is to develop a sustainable increase of the production by following the concept of "neighbourhood production, by the neighbourhood and for the neighbourhood".

One way to include urban agriculture into land-use planning is to include it in zoning policies. In the "General urban and land-use plan for the city of Havana" (December 2000), urban agriculture is explicitly mentioned and zoned as an "agricultural corridor" around the urbanised area of Havana.

Table: 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	7,718
(Allotments)	285 state farms	
Popular Gardens	5,000 gardens	1,854
	26,604 gardeners	
Business and Factory Gardens	384 gardens	5,368
Household Gardens	Unknown	Unknown
Total	*7,998 gardens*	*15,092 ha*

THE MAIN URBAN AGRICULTURAL SYSTEMS

❖ Horticulturists organised in groups ❖ Production units for intensive vegetable-growing "organoponics" ❖ On-site farms for self-supply of state institutions and organisations ❖ Credit and service co-operatives, in which farmers owning private land are organised ❖ Livestock production units on land given on loan for productive use only ❖ State farms for the production of vegetables, meat, cereals and fruit ❖ The *Mi Programa Verde* ("my green programme") programme for urban forestry ❖ Network of agricultural advisors, veterinarians and centres for the production of biological agents ❖ A strong development of organic agriculture.

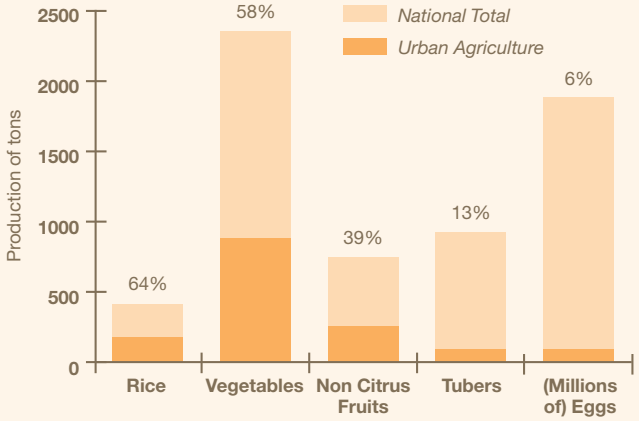


Figure 1 Urban Agriculture as a Percentage of Total Production (MINAGRI, 2000; Cuba News 2000)

LESSONS LEARNED WITH RELEVANCE TO OTHER CITIES

❖ Integration of everybody involved in agriculture.
❖ Promotion of individual and collective participation of the population in urban forestry.
❖ Linking production units with youth groups and schools in order to improve nutrition and promotion of better eating habits.
❖ Research at the service of the producer.
❖ Development of co-operation projects between NGOs local and international (basic element in the development of the UA program in La Habana).
❖ Further improvement of commercialisation to reach more and more consumers directly from the production site.
❖ Systematic training of producers, technicians and extensionists in close co-operation with scientific institutions.

Based on: González Novo M and Fúster Chepe E. 2000. Fact sheet on Cuba. GTZ. ❖ Bourque M and Cañizares E. 2000. Urban Agriculture in Havana, Cuba: Food production in the community by the community and for the community. Urban Agriculture Magazine 1(1): pp 27-29. ❖ González Novo M and Murphy C. 2000. Urban agriculture in the city of Havana: a popular response to crisis. In: Bakker et al.(eds),Growing Cities, Growing Food, Urban Agriculture on the Policy Agenda (Feldafing: DSE), pp 329-347.

ZIMBABWE Harare

Harare is the capital, the largest commercial centre, and the seat of political and administrative power in Zimbabwe. The 1998 population of Harare was around 1.9 million inhabitants.

The growth and geographical spread of urban agriculture in Zimbabwe is largely attributed to the harsh effects of economic structural adjustment programmes, manifested by the erosion of basic wages, escalating prices of basic commodities and the widening of the gap between rich and poor households. Studies by ENDA-Zimbabwe in 1994 indicated that the total land area under cultivation in the City of Harare increased dramatically after the structural adjustment programmes were launched in the early nineties. The area of land under cultivation in the city has increased even further under the economic hardships of the last years. Research has shown that the majority (90%) of urban cultivators in Zimbabwe is women who are engaging in urban agriculture as a strategy for poverty alleviation. Households save money by consuming their own produce rather than by purchasing it. As in many other developing countries, urban agriculture is a necessity as it is practised to supplement household food supplies, unlike in developed countries where it is practised as a leisure activity.

Planners in most Zimbabwean urban centres view urban open-space cultivation as standing in the way of urban development. Furthermore, the promotion of free market operations in the distribution of urban land is pushing the poor and powerless out of urban economic operations. However, recently the City of Harare, together with the Ministry of Local Government, initiated a process of stakeholder consultation and policy development to stimulate UA. Nevertheless, the successful and sustainable integration of urban agriculture into urban land-use systems in Zimbabwe remains a complex task, requiring a multi-stakeholder approach in which the urban professional planners take a leading role and provide a conducive operational environment. This also requires intensive public and political awareness-raising and strict observance of ethics of good urban governance.

In Harare, more than 20,000 urban farmers had enough food in 2001, because of good harvests. This is in contrast to most of the city dwellers who face food shortages due to the economic crisis. The City of Harare has acknowledged the importance of this activity and tolerates maize cultivation on fallow areas in the city, even allocating plots to urban residents, and has started stakeholder meetings to develop adequate policies.

Beacon Mbiba

Fruit market in Harare

THE MAIN URBAN AGRICULTURAL SYSTEMS

UA in Harare takes place within the boundaries of individual properties (on-plot agriculture), also described as backyard gardening. Secondly, it is also carried out on the large public open spaces and agricultural allotments (off-plot agriculture). A third category, peri-urban agriculture, produces crops within a radius of up to 150 km but is functionally integrated into the city.

Production in the on-plot and off-plot categories is largely for subsistence, while at most only 10% of output is marketed. The bulk of produce marketed in Harare (both formally and informally) is sourced from the rural peri-urban regions.

Whilst all farming activities are of great concern to local urban planning authorities, the off-plot mode of intra-urban agricultural production is the most contentious and problematic in urban planning practice, and officially illegal. Urban planners are expected to address both the current needs of the urban citizenry, and to protect and preserve the urban ecological and physical environments. In most instances, matters pertaining to the livelihood systems of the urban populace, mostly the poor, have played second fiddle to inflexible environmental planning considerations.

LESSONS LEARNED WITH RELEVANCE TO OTHER CITIES

- De-regulation does not necessarily mean poor hygiene.
- A large demand for fresh food could only be met by expanded productivity and efficient marketing methods that reduce waste during transit.
- Fresh food can be sold successfully in the city centre and urban food production and marketing can be big business for local people.
- Marketing support needs to be complemented with production support for producers within the city.

Based on: Mbiba B. 2000. Fact sheet on Zimbabwe. GTZ ❖ Mbiba B. 2000. Urban Agriculture in Harare, between suspicion and repression. In: Bakker et al. (eds), Growing Cities, Growing Food, Urban Agriculture on the Policy Agenda (Feldafing: DSE), pp 285-302. ❖ Chaipa. I. 2001. The Urban Planning Dilemma in Harare. Zimbabwe . Urban Agriculture Magazine 1(4): pp 17-18

SENEGAL Dakar, Niayes

In 1995, the total population of Senegal rose above 8,300,000 inhabitants. The urbanisation rate stands at 40%. Dakar represents half of the urban population of the region, and more than 20% of the total population.

Dakar has close ties with its agricultural hinterland, the Niayes zone, for its food supply. The main agricultural cities of Senegal are located in the Niayes Zone. Production in this zone accounts for more than two-thirds of the total horticultural production, and urban livestock is also well represented. Livestock keeping is well integrated into the production systems, in the form of waste recycling and animal traction.

Under the current crisis in rural agriculture and increasing urban food insecurity, urban agriculture is increasingly contributing to urban food security. The development of livestock keeping in and around the main urban centres in the Niayes zone is making an important contribution to milk, meat and egg production, all of which are key elements in the diets of women and children. Livestock-product marketing also contributes to income generation for women.

The surface area set aside for growing vegetables in Senegal increased from 8,000 hectares in 1986 to 12,050 ha in 1997. Likewise, vegetable exports have progressed from 4,500 tonnes in 1994/95 to 5,857 t in 1995/96, worth CFA 3 billion. In Mauritania, the fruit and vegetable yield reached 65,000 tonnes in 1997, of which 18% came from the city of Nouakchott.

Table: Production profile in urban and peri-urban systems

SYSTEM	PRODUCTS
Urban system	*Small ruminant meat*
	Small-cale poultry production (meat and eggs)
	Hide and skin (from slaughterhouse)
Peri-urban systems	
Dior sub-system	*Dairy industrial (milk and cheese)*
	Dairy traditional (milk, butter and cheese)
	Poultry industrial (meat and eggs)
	Beef
	Small scale rabbit and turkey production
Niayes sub-system	*Small ruminant and small scale poultry production*

THE MAIN URBAN AGRICULTURAL SYSTEMS

❖ ***Family peri-urban market gardening systems (around 3,500 farms)*** • Size of 0.1 to 1 hectare per farm • Family size ranges from 10 to 12 persons • More than 70% men-headed • The bulk of vegetables is sold and contributes to 70% of urban supply • Few investments

❖ ***Capital-based peri-urban systems of vegetable production (around 1,500 farms)*** • Size of 1 to more than 20 hectares per farm • More than 90% men-headed • Production for urban market and exports • Modern irrigation (drilled and motor-pumped) and mechanisation

❖ ***Peri-urban poultry systems (about 350 farms)*** • More than 90% of farmers are men • Mixed production of battery chicken and laying hens • Produce is mostly for sale

❖ ***Backyard market gardening and livestock rearing*** • Sheep, poultry and vegetables for family consumption and sale (women and men)

HORTICULTURE PROJECTS: EFFICIENT USE OF RECYCLED URBAN WASTE

For most of Dakar's districts, adequate systems of collecting wastewater and household rubbish are not available. However, in some districts where these systems exist, waste is traditionally used as inputs by small market gardeners, without any treatment. The global objective is to link the urban development challenges of food security and health, waste resource reuse, environmental protection and community resource management. The strategy is a system of integrated and participatory management of wastewater and household rubbish. Target stakeholders are residents of disadvantaged districts.

Emphasis must be placed on strengthening or creating effective organisations to market the products from urban agriculture both in the wholesale and retail markets by:

❖ revitalising the wholesale redistribution platforms in Dakar;

❖ adjusting the credit unions to the investment capacities of producers, wholesalers and retailers; and

❖ discussing marketing problems in platforms can lead to shared solutions and action plans aimed at concrete objectives, such as reducing seasonal losses and reducing imports.

To facilitate access to credit and livestock inputs in urban and suburban systems, farmers are organised into economic interest groups. Various initiatives have been developed in different regions of the Niayes, and Thiès has up to 123 such groups. These organisations are a tentative response to poor government assistance, which in the past has left the producer open to the rough realities of the market. Government support for the stimulation of self-management in urban agriculture systems should be encouraged.

LESSONS LEARNED WITH RELEVANCE TO OTHER CITIES

❖ Horticulture has to be sustained as an opportunity to recycle the high quantities of urban waste.

❖ People involved in these activities have shown interest and great capacity in management.

❖ Opportunities for economic activities and micro-enterprise have been created giving additional employment and income.

Based on: Mbaye A and Moustier P. 2000. Fact sheet on Senegal. GTZ. ❖ Mbaye A. and Moustier P. 2000. Market -Oriented Urban Agricultural Production in Dakar. In: Bakker et al. (eds), Growing Cities, Growing Food, Urban Agriculture on the Policy Agenda (Feldafing: DSE), pp 235-256. ❖ Touré Fall S and Cisse I. 2000. Urban livestock systems in the Niayes zone in Senegal. *Urban Agriculture Magazine* 1(2): pp17-19. ❖ Diop Gueye NF and Sy M. 2001. The use of wastewater for urban agriculture. *Urban Agriculture Magazine*.1(3): pp 30-32.

MEXICO Mexico DF

The Mexico City Metropolitan Zone covers an area of 7,860 km2 and includes the Federal District and 54 municipalities. Urban agriculture in Mexico City is mainly a subsistence activity, often run alongside other economic activities. This kind of agriculture has developed outside regulatory frameworks and institutional or government control. Production is organised according to traditional systems. Farming in the central urban area often violates government regulations. The urban production of ornamental plants (Chinampa system) is particularly important for local markets: 45% of Mexico City's supply is produced in the chinampas. This system represents an alternative route for central urban agricultural development.

Mexico City's southern edge is an extensive semi-rural/semi-urban agricultural zone, having a large number of backyard/rooftop family livestock units. Backyard, or urban, livestock may include varying populations of animals ranging from two to nine animal species per household. Despite livestock activity in this marginal sector, neither local nor national censuses have shown interest in them. This lack of interest is unfortunate as family urban production contributes to self-reliance and support to the general economy.

"Milpa Alta" peri-urban agriculture/Mexico City

Vacant lot used for maize crop

Urban agricultural systems perform a gamut of functions and go beyond simply producing foodstuffs. Agriculture is framed within the context of broader cultural activities where, for example, festivals and celebrations important to community cohesion coexist alongside natural phenomena and agricultural cycles, as well as technologies and services implicit to city life.

There is also a continuous movement of urban and peri-urban farmers between the rural and urban environments. For example, the numerous *nopal* (prickly pear cactus) producers in Milpa Alta commute to the city centre daily, to work in typical urban jobs (guards, civil servants, construction workers, etc.). For the rest of the day and in the weekends, they work their *milpa* (cornfield).

In sub- and peri-urban areas, maize production provides 10-30% of the household income, although the greater part of the grain produced is directly consumed in the family. Vegetable and legume production, on the other hand, accounts for up to 80% of income, and for flower and ornamental plant production the figure is even higher. *Nopal* greens and *tuna* are largely channelled into the Mexico City market, and account for 100% of family income during the summer high season, or when prices are at their peak in the winter.

THE MAIN URBAN AGRICULTURAL SYSTEMS

Urban – central city agriculture There are many farms dedicated to milk and meat production. Backyard agriculture is mainly found in poorer neighbourhoods. Urban horticulture has largely been developed by ecological groups and NGOs for environmental education purposes.

Suburban agriculture The main production system in the suburban *chinampa* area and is mainly located in the southeast of Mexico City. In this area, there are many canals and few buildings and paved roads. The system occupies areas surrounded by water (*chinampa*) and produces vegetables, cereals, forage crops and ornamental plants.

Peri-urban agriculture Those satellite towns that form a transition area between countryside and city have distinct agricultural activities determined by labour input and environmental conditions, for instance the intensive terrace farming of *nopal* (Milpa Alta catering for the entire Mexico Metropolitan area).

LESSONS LEARNED WITH RELEVANCE TO OTHER CITIES

- The old production systems, like *chinampa*, have adopted technological innovations (greenhouses, phytoregulators and improved seeds). However, innovations like chemical inputs can increase environmental pressures on less disturbed ecosystems around the city.
- There is great scope for reusing waste from the food industry and households to feed animals.
- Local knowledge and oral transmission is vital for successful dissemination and development of productive technologies.
- The sale of products in local markets helps develop important tourist corridors.
- The co-existence of urban activities, services and industry together with UA activities, including horticulture and floriculture, etc. helps households find strategies that protect families against economic crises.

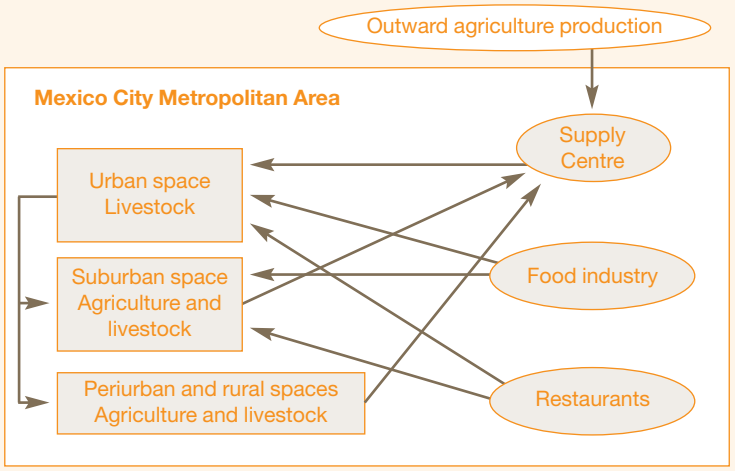


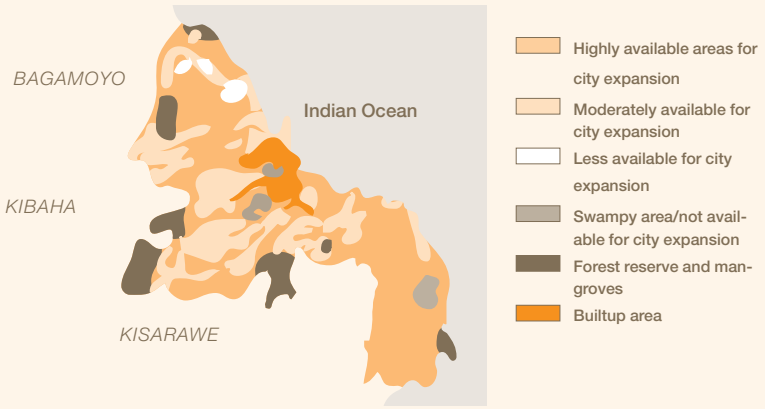
Figure: Mass and energy flows between different areas of urban agriculture

Based on: Rodriques Sanchez L.M.2000. Fact sheet on México. GTZ. ❖ Torres Lima P, Rodriques Sanchez LM and Garcia Uriza BI. 2000. Mexico City: the integration of urban agriculture to contain urban sprawl. In: Bakker et al. (eds), Growing Cities, Growing Food, Urban Agriculture on the Policy Agenda (Feldafing: DSE), pp.363-390. ❖ Arias E. 2000. Linking students to urban livestock producers in Mexico City.Urban Agriculture Magazine 1(2): pp 38-39.

Urban Vegetable Promotion Project

TANZANIA Dar es Salaam

Strategic Urban Development Plan Framework



DAR ES SALAAM, TANZANIA

Dar es Salaam is by far the most important urban centre in Tanzania. With rapid urban growth in the last two decades, this city now accounts for about 35% of the total urban population of Tanzania. It is seven times larger than the country's next urban centre. Rural-urban migration and natural growth equally share the increase in Dar es Salaam's population to date.

A number of forces have driven the mushrooming of urban farming and livestock keeping in Dar es Salaam. They include: poverty; decreasing formal employment; proximity to markets; availability of services; government policy (notably in 1982); culture and non-enforcement of laws, regulations and by-laws.

THE MAIN URBAN AGRICULTURAL SYSTEMS

Farming and livestock keeping in the city of Dar es Salaam is undertaken either in the backyard, near homes, in vacant lots around the city, and in the peri-urban areas.

Substantial farming takes place in the many valleys and swampy areas. The size of the plots increases as one moves away from the centre to the periphery, while intensification moves in the opposite direction. Crops include vegetables and fruits. The table below shows the growth in animals kept in the city (or full table, or only 1985, 1990, 1993?).

Home gardening is the most common production system in urban areas. This can be found in high-, medium- and low-density areas. Women usually attend to the gardens. Production is for subsistence needs, and small livestock, and sometimes even cattle are kept. It reduces household expenses and contributes to the diet. Production is hampered by access to water and availability of space. Open-space production in the urban areas is clearly market-oriented and supplies the city with fresh, leafy vegetables. The production is done by men and often the only source of family income. Major constraints are security of land rights and quality and regular supply of water. The average plot size ranges between 700 - 950 m.

Peri-urban production is market-oriented and practised by farming families. Apart from vegetable production, staple crops and livestock are also produced. Access to markets and input supply are among the major constraints mentioned by farmers. The average farm size is 5 acres (or 2.02 ha).

PLANNING

Urban plots serve more than one purpose. Provision of food is still the most important, but the need for open spaces in an otherwise densely constructed area and improving the city ecology are also served. To improve access to land, the city authorities are encouraging the vertical expansion of buildings, to free some space in the built-up areas and in potential areas for city expansion. In Dar es Salaam, UA has received attention and support on various policy levels and is accepted as a land use in the city. In the Strategic Urban Development Plan (SUDP), special land-use zones have been designated for agriculture (See Map); ideas necessary for revising municipal by-laws and regulations are incorporated and a platform for coordination has been established.

TABLE: Animals reared in Dar es Salaam City

Year	Dairy cattle	Layers	Broilers	Local fowls	Ducks	Pigs	Goats
1985	3,318	221,920	146,205	88,720	4,900	6,795	1,361
1986	4,200	292,000	180,500	93,389	6,800	8,601	2,617
1987	5,278	390,000	194,500	98,304	8,100	10,454	3,820
1988	7,105	445,000	237,000	103,341	10,449	13,383	5,764
1989	8,597	551,800	282,083	108,508	13,479	15,658	8,531
1990	10,402	664,232	335,624	113,933	17,388	18,946	12,626
1991	12,586	824,448	399,393	119,630	22,431	22,925	18,686
1992	15,229	1,027,275	475,276	125,611	28,936	27,739	27,655
1993	18,286	1,225,392	565,579	131,891	37,327	33,564	40,930

LESSONS LEARNED WITH RELEVANCE TO OTHER CITIES

- Farming in and around the city does have various functions and characteristics. As a consequence, different support measures are necessary.
- Urban and peri-urban production do not necessarily compete, but can be complementary - both in terms of produce supplied and marketing channels used.
- Urban cultivation is a productive way of maintaining green lungs and open spaces in the city.
- Peri-urban farmland will make way for future city expansion. In order to maintain a minimum of food supply, areas need to be legally reserved for production.

Based on: Jacobi P, Kiango S and Amend J. 2000. Fact Sheet on Tanzania. GTZ. ❖ Jacobi P, Amend J and Kiango S. 2000. Urban agriculture in Dar es Salaam: providing for an indispensable part of the diet. In: Bakker et al. (eds), Growing Cities, Growing Food, Urban Agriculture on the Policy Agenda (Feldafing: DSE), pp 257-284. ❖ Kitilla MD and Mlambo A. 2001. Integration of agriculture in city development in Dar es Salaam. *Urban Agriculture Magazine* 1(4); pp 21-23.

INDIA Hubli-Dharwad and Calcutta

Poor traders transporting fish from wastewater-fed ponds to market in Calcutta.

Peter Edwards

LIVESTOCK IN HUBLI-DHARWAD AND CALCUTTA

In India, livestock keeping is a tradition. But buffalo, cattle, pigs and chickens are also kept in towns and cities to contribute to household livelihoods and food security. Urban centres provide a number of incentives for keeping livestock, such as the availability of cheap foodstuffs (food waste from hotels and vegetable waste from markets and homes) and easily accessible markets, particularly for fresh milk from urban dairies.

In and around the city there are large and small dairies. About twenty commercial enterprises keep between ten and twenty buffaloes and cross-bred cows. By far the largest number of urban dairies belong to traditional buffalo keepers, known as *gowlies*. Some of these households rely solely on the milk produced by buffaloes as their source of income, others may rely more on urban-based work, but keep one or two buffaloes as a source of milk for their family and as an additional source of income.

Hubli-Dharwad also has a significant number of scavenging pigs, owned by quite distinct communities within the city, whose main occupation is hammering scraps of metal into utensils. As with buffalo keeping, pig owning is a tradition, handed down from generation to generation. Pig-owning communities can be found in several areas of Hubli-Dharwad, depending on tradition, but also on proximity to areas where pigs can roam for food.

Rural-urban linkages are a crucial part of urban and peri-urban agricultural activities undertaken in Hubli-Dharwad. The flows of fodder, wastes, labour and investment between the rural and urban areas form a critical component in maintaining food security and livelihoods within the city region. Many of the flows exist because of inadequate enforcement of legislation and a lack of environmental services. Such flows include the sale of sewage that has filled a recreation tank in Dharwad, the sale of market waste to farmers (waste that should belong to the Municipal Corporation) and the sale of municipal solid waste, which reduces the amount of waste in the dumpsites.

FISH FARMING IN CALCUTTA

Farming fish in ponds fertilised with urban wastewater or sewage is not widespread although it does benefit millions of people, particularly in China, India and Vietnam. It provides food and employment, particularly for the poor, and more general environmental benefits such as low-cost wastewater treatment, stormwater drainage and provision of green areas or "lungs" which improve the health and well-being of urban residents.

Calcutta is located in West Bengal where a cultural preference exists for fish as compared to meat. Large- and small-sized fish appear to be purchased by different socio-economic groups of city dwellers, by the better-off and poorer consumers, respectively. The wastewater-fed fish ponds in Calcutta cover about 2,500 ha and are located in a government-designated recycling region for the city which also includes the cultivation of vegetables on wastewater, garbage and rice in paddy fields irrigated with fish-pond effluent.

The major health risks in wastewater-fed aquaculture are both the biological hazards from potential disease-causing organisms in human excreta in domestic wastewater, and chemical hazards from industrial effluents. In Calcutta, there is an unregulated discharge of effluents from thousands of small-scale factories and tanneries into urban wastewater channels that drain into fish ponds.

Several new wastewater-fed aquaculture systems have recently been constructed in India. These include pre-treatment as wastewater reuse has been accepted by local governments as being superior to conventional mechanical treatment plants in terms of cost, benefit and reliability.

Table: Issues associated with livestock keeping in Hubli-Dharwad

Advantages	Disadvantages	
Input supply/Production	• availability of vegetable waste; • availability of sewage water.	• lack of water; • lack of fodder and grazing land.
Management	• consume organic waste and some night soil.	• traffic chaos; • blocking storm drains; • lack of space to keep livestock and store fodder and dung.
Transformation and commercialisation	• dung as fuel and fertiliser; • access to market.	• lack of storage.

J. Bentinck

Woman washing a buffalo

Based on: Nunan F. 2000. Waste recycling through urban farming in Hubli-Dharwad. In: Bakker et al. (eds), Growing Cities, Growing Food, Urban Agriculture on the Policy Agenda (Feldafing: DSE), pp 429-452. ❖ Nunan F. 2000. Livestock and livelihoods in Hubli-Dharwad. *Urban Agriculture Magazine* 1(2): pp10-12 ❖ Edwards P. 2001. Public health issues of wastewater-fed aquaculture. *Urban Agriculture Magazine* 1(3): pp 20-22 .

THE PHILIPPINES Cagayan de Oro, Manila, Marilao

Agricultural production is important for many city dwellers in the Philippines. Production of meat and fresh vegetables compensates the need for vitamins, or adds to family income, in the smaller towns and in the larger cities of Manila or Cagayan de Oro.

URBAN AGRICULTURAL PRODUCTION IN CAGAYAN DE ORO

Cagayan de Oro is a boomtown located on the central coast of Northern Mindanao in southern Philippines, with about 500,000 inhabitants and an average population density of 876 persons/km^2. 79% of the land is peri-urban and 21% is urban. Of the 22,000 ha allocated by the city to agriculture, only 10% is used for crop production.

In the peri-urban areas of Cagayan de Oro, some 13,000 small-scale farmers and tenants (of whom 3,000 are women) farm on 2,276 ha of land (1995). They produce rice, maize, banana, coffee, root crops, fruit and vegetables, for both home consumption and market sales.

About 70% of the city's demand for fish is produced within the city. More than 40% of the total urban households maintain backyard gardens. Farm size averages at 1.7 hectares, with about 0.5 ha being used for growing vegetables.

Farming families, because of their low income, eat more fish and eggs than meat (Potutan 1998).

However, daily consumption of vegetables is highest among farmers (85%) and lowest among consumers in the higher socio-economic classes (64%). This suggests that, while urban farmers belong to the poorer economic classes, they have a healthier diet because of their farming.

Traditionally, farming falls under the male domain, while women are responsible for household chores like cooking, cleaning and laundry. However, marketing of agricultural produce is mainly a women's task: 73% of vendors of agricultural products are women (Arnado et al. 1998, Potutan et al. 1998).

The support of the city government for urban agriculture is manifest in proposed legislation pertaining to home gardens, school gardens and access to government lands for peri-urban and urban farmers. But planning, policy initiatives and programme monitoring are still limited and scattered. Policy-makers need to be more aware of the importance of integrating urban agriculture into urban planning and budgeting. Many NGOs have already been assisting the development of urban agriculture in Cagayan de Oro by strengthening collaboration, most notably with local administrations and municipalities.

LESSONS LEARNED WITH RELEVANCE TO OTHER CITIES

- Research is a very important component.
- Collaborative efforts of various stakeholders and the partnerships help streamline urban agriculture activities, thus avoiding project duplication and minimising costs.
- City school gardens can contribute to food production.

VEGETABLE PRODUCTION IN MANILA

Population growth in Manila with its attendant problems of waste disposal and competition for finite resources exacerbates environmental degradation and threatens fragile political systems with the potential for economic chaos. During the period 1990-1995, the population of Manila grew at a rate of 3.3% per year and was expected to reach 10.7 million in 1998. The population was 9.454 million or 1.998 million households in 1995, the last year for which data are published. Of those households, 432,450 or 21.6% were squatters living in 276 slum colonies located at about 70 sites in Metro Manila (17 municipalities).

Table: Actual land use in Cagayan de Oro City

Actual land use	Area (ha)	Percentage (%)
Agricultural	21,845	44.7
Open spaces	18,775	38.4
Residential	4,669	9.6
Others	2,751	5.6
Industrial and commercial	815	1.7
Total	**48,885**	**100.0**

Source: Cagayan de Oro City Assessment Department 1995

Urban vegetable production in Manila

Christian Ulrichs

Some of the nutrient deficiencies in Manila can be improved through increased vegetable consumption close to the consumers. A project entitled "Development of peri-urban vegetable production systems for sustainable year-round supplies to tropical Asian cities" aims to improve production systems for the markets in Metro Manila. (Burleigh and Black, 2001).

WASTE RECYCLING IN MARILAO

In Marilao - a city with 15,000 inhabitants, located on the fringe of Manila - city governors were confronted with the problem of solid waste disposal. Through waste segregation, in the solid waste management project, compost was generated from the biodegradable parts. Non-governmental organisations and community residents were asked to initiate and support the development of agricultural and forestry activities in the city (Duran et.al., 2001).

Compost substrate, potted flowers and vegetable seedlings are provided, with the message that these materials can be used to "re-green" the neighbourhoods and to raise safe and nutritious food for the family and community. The prevailing practice was to give vitamins and supplements to children. Now the households produce vegetables themselves, and also learn the tangible benefits of the practice of segregation.

Based on: Potutan GE, Holmer RJ and Shnitzler W. 2000. Fact Sheet on the Philippines. GTZ. ❖ Potutan GE, Shnitzle W, Arnado JM, Janubas LG and Holmer RJ. 2000. Urban Agriculture in Cagayan de Oro: a favourable response of city government and NGOs. In: Bakker et al. (eds), Growing Cities, Growing Food, Urban Agriculture on the Policy Agenda (Feldafing: DSE), pp 413-428. ❖ Burleigh J.R. and Black LL. 2001. Supporting farmers towards safe year-round vegetables in peri-urban Manila. *Urban Agriculture Magazine* 1(3): pp15-16. ❖ Duran LS, Batac JH, Drechsel P. 2001. Planning in a changing environment, the case of Marilao. *Urban Agriculture Magazine*.1(4): 40-42

KENYA Nairobi and Nakuru

René van Veenhuizen

Cow shed in Nairobi

NAIROBI, KENYA

The present population of Kenya is estimated to be about 30 million. The average population growth between 1980 and 1993 was 3.3%. There is a large influx of people from the rural areas. Most of the migrants end up in one of the low-income areas of the city. Almost half (47%) of Nairobi's population lives in very-low-income neighbourhoods. Population densities can reach values of more than 30,000 persons/km^2.

Farming activities are everywhere. Along roadsides, in the middle of roundabouts, along and between railway lines, in parks, along rivers, under power lines, in short, in all kinds of open public spaces, crops are cultivated and animals like cattle, goats and sheep roam around. People of all socio-economic classes grow food whenever and wherever possible.

UA is promoted in Nairobi primarily to help the poor to feed themselves and improve their nutritional status. One of the very few examples to see whether this is really so, is a study carried out in 1994 in the Nairobi slum of Korogocho. Of a group of farmers compared to a group of non-farmers (with comparable household income levels) the farmers regarded their food situation as better than non-farmers. This was confirmed by a higher energy intake (100 kcal/consumer unit/day) originating entirely from their own production, and a lower percentage of children stunted or severely malnourished.

Table: Origin of energy intake (Kcal/consumer unit/day)

	Farmers (48)	Non-farmers (67)
From own urban production	263	-
Donated by others	102	96
Purchased	1539	1707
Total	**1904**	**1804**

Source: Mwangi 1995

THE MAIN URBAN AGRICULTURAL SYSTEMS IN NAIROBI

Small-scale subsistence crop cultivation: This is by far the dominant type of farming. Farmers always plant a variety of crops on their shambas. The work is mainly performed by women, with very limited use of modern inputs. Many farmers till land that does not belong to them. The main purpose is to raise the level of the household's food security. Part of the production is sold.

Small-scale livestock production: This is quite common, especially in the open spaces on the outskirts of the city, and often combined with crop cultivation. Poultry is kept everywhere, but modern practices are not very common. There are also a few cases of small-scale market-oriented crop cultivation, e.g. the cultivation of ornamental crops and the production of vegetable seedlings, and large-scale commercial farming in the south-western part of the city. Fodder (usually urban waste) is brought to the animals, that spend the night under the same roof as the owner until ready for sale.

LESSONS LEARNED WITH RELEVANCE TO OTHER CITIES

- Poor urban households in Nairobi with urban agriculture are better off (food security, energy intake and nutritional condition).
- Poor urban households benefit in two ways from agriculture in the city: a greater energy and protein intake, and less money spent on food purchases.
- The very low level of farming techniques means there is considerable scope for higher yields by using modern inputs.
- Since most of the poor urban farmers use land belonging to someone else, they tend not to invest in their farm production. A greater certainty of access to land would undoubtedly lead to higher yields. Here lies a special responsibility for the local authorities.

NAKURU

Nakuru is located in the heart of the Great East African Rift Valley, 160 km north-west of Nairobi. It is the fourth largest town in Kenya, with a population of 240,000. The annual growth rate between the censuses of 1989 and 1999 was 4.3%. There are over 100 agro-industrial establishments ranging from food processing to farm machinery assembly.

Twenty percent of all the Nakuru households could be classified as livestock keepers in town. Although livestock is kept by all urban income categories, the activity becomes more common as incomes rise. The total number of animals is considerable, and for the large majority of these people, the produce forms an important food source and for many an income source as well. Moreover, it provides employment to a number of people, which is a factor that should not be neglected by policy-makers.

THE MAIN URBAN AGRICULTURAL SYSTEMS IN NAKURU

- Few large farms located on the fringes of the town.
- Many small-scale farms in the *peri-urban* areas (i.e., the areas between the built-up area and the town boundaries). With the growth of the town's population, many of these small farms have been subdivided into smallholder portions and urban residential plots.
- The usually less visible form of *intra-urban* agriculture (i.e., within the built-up area). Though very common, intra-urban farming is generally a much more modest activity ("micro farming") mainly due to lack of space. However, intra-urban farming is not a marginal activity in terms of household income; for many, it constitutes a significant element in the household's food supply and/or income.

Based on: Foeken D and Mwang AM. 2000. Fact Sheet on Kenya. GTZ ❖ Foeken D and MwangiAM. 2000. Increasing food security through urban farming in Nairobi. In: Bakker et al. (eds), Growing Cities, Growing Food, Urban Agriculture on the Policy Agenda (Feldafing: DSE), pp 303-328. ❖ Foeken D and Owuor SO. 2000. Livestock in a middle-sized East African town: Nakuru. Urban Agriculture Magazine 1(2): pp20-22 .

GHANA Accra and Kumasi

ACCRA

The Greater Accra area accounts for 13 percent of the total population of Ghana. The city of Accra covers 17,362.4 hectares and has an estimated population of 2,500,000. Population density is on average 100 people per ha, but varies from 20 people per ha in the newly developing high-income areas to as many as 400-500 people per ha in the most densely populated low-income neighbourhoods.

Urban agriculture is a means of securing incomes. Women play important role in marketing. Ghana has introduced the "Farmer's Day" as a national holiday where awards are given to best urban and peri-urban farmers. Urban agriculture converts idle land into green space; and green zones and green belts are important to the city authorities, and therefore play an important role in urban planning.

KUMASI

Kumasi, the capital of the Ashanti region in Ghana, has a population of approximately one million. There are also about 1,470 registered commercial farms in the city as well as some 30,000 backyard farms (Drechsel et al. 2000).

Livestock production is a vital part of Kumasi's UPA and contributes significantly to its agro-industrial sector. The most profitable and attractive forms of livestock farming - especially in and around the city - is probably poultry and egg production. Between 1986 and 1995 Ghana's poultry population doubled from 6.4 million to 13.1 million. Poultry farming is practised by people from all social sectors. Farmers in and around Kumasi benefit from the large amounts of poultry manure generated, as this offers them access to a cheap but high-quality fertiliser. The potential of this resource is increasingly being realised. There are reports of trucks transporting the manure from Kumasi to the northern parts of the country and even to Burkina Faso.

The main constraints on the development of the sector has been limited access to productive resources: access to land, security of tenure, availability of water and other inputs, and a lack of support services.

MAIN URBAN AGRICULTURAL SYSTEMS

- Vegetable-growing systems (irrigated and rainfed)
- Animal systems (both commercial and subsistence, predominantly poultry)
- Backyard farming and miscellaneous minor farming systems

AREAS FOR INTERVENTION

Land tenure security The authorities are developing legislation to create green zones specifically for urban and peri-urban farming. Building permits can be refused in designated greenbelt areas to give existing farmers the long-term security they need.

Improving the provision of extension services

Information and training on bio-intensive farming methods is provided at weekly meetings with farmers groups.

Provision of safer water for irrigation Much of the vegetable cultivation in Accra is irrigated with water from the city's streams and drains. Cleaner water provision includes the siting of a sewage-treatment plant within the customary land rights farming area at La.

IBSRAM

Cabbage farmers in Kumasi broadcasting poultry manure. Rain washes the manure into the hand-dug well at the lowest point of the field.

The following recommendations could contribute to the development of a safe and environmentally sound peri-urban irrigated agriculture (Sonou 2000):

- Training in management;
- Sensitisation and education campaigns;
- Implementation of appropriate health protection measures;
- Development and promotion of sanitation and irrigation technologies;
- Identification of the geographical extent of contamination and definition of the priority for action; and
- Designing and implementation of a water-quality certification programme.

LESSONS LEARNED WITH RELEVANCE FOR OTHER CITIES

- Whilst urban agriculture is not a prohibited activity in Accra, official recognition of the practice together with the institution of the necessary administrative structures is needed for its sustained development.
- Contrary to popular belief, it is possible to formulate and implement policies and measures that address problems of land access and tenure.
- The provision and access to extension services is more effective when farmers groups are well organised.

Based on: Armar Klemesu M. 2000. Fact sheet on Accra, Ghana. GTZ ❖ Armar Klemesu M and Maxwell D. 2000. Accra: Urban Agriculture as an Asset Strategy, Supplementing Income and Diets. In: Bakker et al. (eds), Growing Cities, Growing Food, Urban Agriculture on the Policy Agenda (Feldafing: DSE), pp 183-207. ❖ Drechsel P, Amoah P. Cofie OO, Abaidoo RC. 2000. Increasing Use of Poultry Manure in Ghana. Urban Agriculture Magazine 1(2): pp 25-27. ❖ Sonou M. 2001. Peri-urban Irrigated Agriculture and Health Risks in Ghana. Urban Agriculture Magazine 1(3): pp 33-34. ❖ Interview with Dr.Sackey, Director AMA, Accra, Ghana. 2001. Urban Agriculture Magazine 1(4)pp 3-5

Agricultural activities in Russia, especially the production of food for subsistence consumption, have a long tradition, but their importance increased especially after the disintegration of the Soviet Union. Surveys in Moscow in 1970 and in 1991 show a shift from 20% to 60% of families engaged in agriculture (UNDP 1996). Agricultural activities of the urban inhabitants are taking place at significant distances from their urban homes. The term "urban agriculture" refers more to agricultural activities of city dwellers than to agricultural activities within the city boundaries only.

RUSSIA St Petersburg

Selling products from the garden on the streets

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. 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 summertime, over 500,000 of them constantly live on their summer residences and other types of buildings on plots.

The main reasons for city dwellers to practice farming are:

- 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; and
- productive use of "free" resources, such as kitchen wastewater and residues.

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 their plots. This is more than all agricultural farms of the Leningrad Region.

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. Thousands of urban people spend almost every weekend in these areas from mid-April until the end of October.

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 (the total city population is nearly 5 million). The 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 needs. 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 integration of urban agriculture into urban planning and development will only be feasible when the majority of the people living in the city consider agricultural activities not only as a means of additional income and self-maintenance, but also as a necessary element of the sustainable development of the city.

TYPES OF URBAN AGRICULTURE

Several types of urban agriculture have been established in St Petersburg, including:

- *Dachas,* which 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.
- 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), usually located in the peri-urban areas of new and industrial cities and towns, now under private ownership.
- 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, usually located in the peri-urban areas of small towns.
- *Factory gardens and greenhouses:* during the communist period, nearly all plants and factories grew food in gardens and greenhouses.
- *Individual permanent houses with backyard gardens* can still be found in the older parts of the city and in the city periphery, while rooftop-gardening is dominant.

Openings-ceremony of community garden

Oleg Moldakov

Based on: Moldakov O. 2000. The urban farmers of St Petersburg. *Urban Agriculture Magazine* 1(1): 24-26.
Moldakov O. 2001. Support for urban farming in St Petersburg. *Urban Agriculture Magazine* 1(4): 13

PERU Lima

The capital of Peru, Lima, is located on an infertile sandy strip along the Pacific Ocean. The average rainfall is 0.0 mm. In this rather unlikely environment, attempts to use urban agriculture as an instrument to improve the living conditions of the resource-poor urban population have been implemented since the crises in the late 1980s.

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

Between the 1950s and 1990s, Lima experienced very rapid growth. This was due mainly to migration, not only from rural areas but also from smaller towns. Nearly 30% of Peru's population, or 7 million people, live in Lima. The second biggest city, Arequipa, has an estimated population of only 696,900 inhabitants.

Much has been done over the last 15 years to disseminate various UA systems among poor urban families, especially in the fast-growing marginal areas: the *pueblos jovenes* of the city. The vast majority of these activities has been promoted by extension staff of private institutions (notably NGOs and local organisations) and public agencies. The experiences have generated a wealth of small-scale productive technologies and widely spread know-how both in the institutions and among the target population. A central element of almost all these activities is the effort to adapt the different UA systems to local, resource-poor conditions in the project area as well as to the educational and economic capacity of target families.

THE MAIN URBAN AGRICULTURAL SYSTEMS

Home gardens: Home gardens make a major contribution to food security in poor areas as well as to the nutritional, economic, and social well-being of poorer households. Producers are mainly low- income migrants in the big city of Lima.

Popular hydroponics: The system of "easy hydroponics" has been introduced by FAO-Chile. It tries to make use of the slope of a plot in order to water the vegetables without using electric pumps. A standard formula for a mix of nutrients (micro- and macronutrients) is applied. The costs of materials can be cut by using discarded wood (for the counter) and different types of plastic waste. Work is also being done to simplify the management of hydroponics by producers.

Guinea pigs: The breeding of guinea pigs is based on research done by the INIA into new breeds of animals adapted to different climates. The materials needed for breeding guinea pigs are not expensive, e.g. rearing cages raised to facilitate cleaning and made of locally available bamboo.

LESSONS LEARNED WITH RELEVANCE TO OTHER CITIES

- Low-income urban families are keen to participate in small-scale food and animal production schemes. To make urban agricultural systems accessible, it is necessary to provide technical assistance and adapt the technology so as to make production less costly, and easier.
- Appropriate agriculture in the city must avoid creating new needs in the implementation stage and use locally available resources.
- Commercialisation is a crucial issue for market-oriented small-scale projects. In addition to training to secure quality production, technical support from institutions - public and private - for marketing is required.
- Promoters, researchers and extensionists in UA most take into account the opportunity cost of female family labour time and keep in mind women's time constraints.

Based on: Dasso A and Pinzas T. 2000. Fact sheet on Peru. GTZ. ❖ Dasso A and Pinzas T. 2000. NGO Experiences in Lima targeting the urban poor through urban agriculture. In: Bakker et al. (eds), Growing Cities, Growing Food, Urban Agriculture on the Policy Agenda (Feldafing: DSE), pp.349-362.

THE SUPPORT GROUP ON URBAN AGRICULTURE (SGUA)

The SGUA dates back to 1992 when the UNDP established the Urban Agriculture Advisory Committee, but was officially founded in 1994. Since then, the SGUA has been looking into the identification of key research and development needs in urban agriculture and how to coordinate and pool the support of its participants.

In the past decade, the number of international support organisations involved in urban and peri-urban agriculture has rapidly grown, which is reflected in the growing number of organisations participating in the SGUA. Presently, over forty international organisations participate, in which a large number of international support organisations, including the UNDP, FAO, IDRC, IFPRI, CGIAR (CIP-SIUPA), NRI, GTZ, Sida, CIRAD, DGIS, DSE, ETC, CARE.

The SGUA aims to stimulate and facilitate activities regarding urban agriculture by national and local governments, NGOs, and agencies for international and bilateral development cooperation, and the direct involvement of local stakeholders in the planning and implementation of such activities.

SGUA seeks to counteract global roadblocks to urban agriculture and actively supports innovative action research and development activities in urban agriculture and related urban development concerns.

The areas of work of the SGUA are:

- Policy development;
- Research; Technical assistance;
- Investment and credit;
- Information and communications.

www.idrc.ca/cfp/sguaf_e.html

FOOD FOR THE CITIES

Food for the Cities is one of the Key Priority Areas for Inter-Disciplinary Action identified by FAO for the implementation of the Strategic Framework adopted in November 1999 as a follow up to the World Food Summit. This mechanism ensures the coordination of units providing technical assistance to member states in a variety of fields such as agriculture production (including livestock, aquaculture and forestry), food processing, marketing and distribution, land tenure, irrigation, group formation, extension, training and communication, micro-finance, food security and nutrition. For further information, please refer to: foodforthecities@fao.org

An informal working group on urban and periurban agriculture allows more specific exchange of information among Headquarters and Regional office staff in FAO. This group relates to other partners either through the SGUA network or through direct formal or informal contacts and partnerships. FAO and RUAF organised jointly the 2000 e-mail conference "Urban and periurban agriculture on the policy agenda" and is represented on the Editorial board of the Urban Agriculture Magazine.

A website for the working group will be released soon. For information on FAO's initiative for "Food Supply and Distribution to Cities" see http://www.fao.org/ag/ags/agsm/sada/SADAE.HTM

www.fao.org

RESOURCE CENTRE ON URBAN AGRICULTURE AND FORESTRY (RUAF)

RUAF is a global information and communications programme implemented by seven regional institutes and coordinated by ETC-International, based in Leusden, The Netherlands. RUAF is a five-year programme that is funded by DGIS (the Netherlands) and IDRC (Canada) and initiated in October 1999.

The general aim of RUAF is to facilitate the integration of urban agriculture into the policies and plans of city authorities and to enhance the active involvement of all local stakeholders (i.e., urban planners, groups of urban farmers, consumer organisations, technical and credit organisations, environmental groups, health authorities, related local small enterprises, and others).

The specific objectives of the RUAF programme are:

- To enhance awareness regarding the potentials of urban agriculture and to facilitate its recognition as an area of intervention
- To facilitate access of local stakeholders to documented experiences, in order to enable practical policy and technology interventions
- To facilitate the identification and analysis of critical issues together with local stakeholders in urban agriculture
- To support local capacity development and networking regarding urban agriculture.
- To facilitate the participatory formulation and implementation of action programmes on urban agriculture.

www.ruaf.org

Urban Agriculture Magazine

SPECIAL ISSUE FOR THE WORLD FOOD SUMMIT: five years later
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