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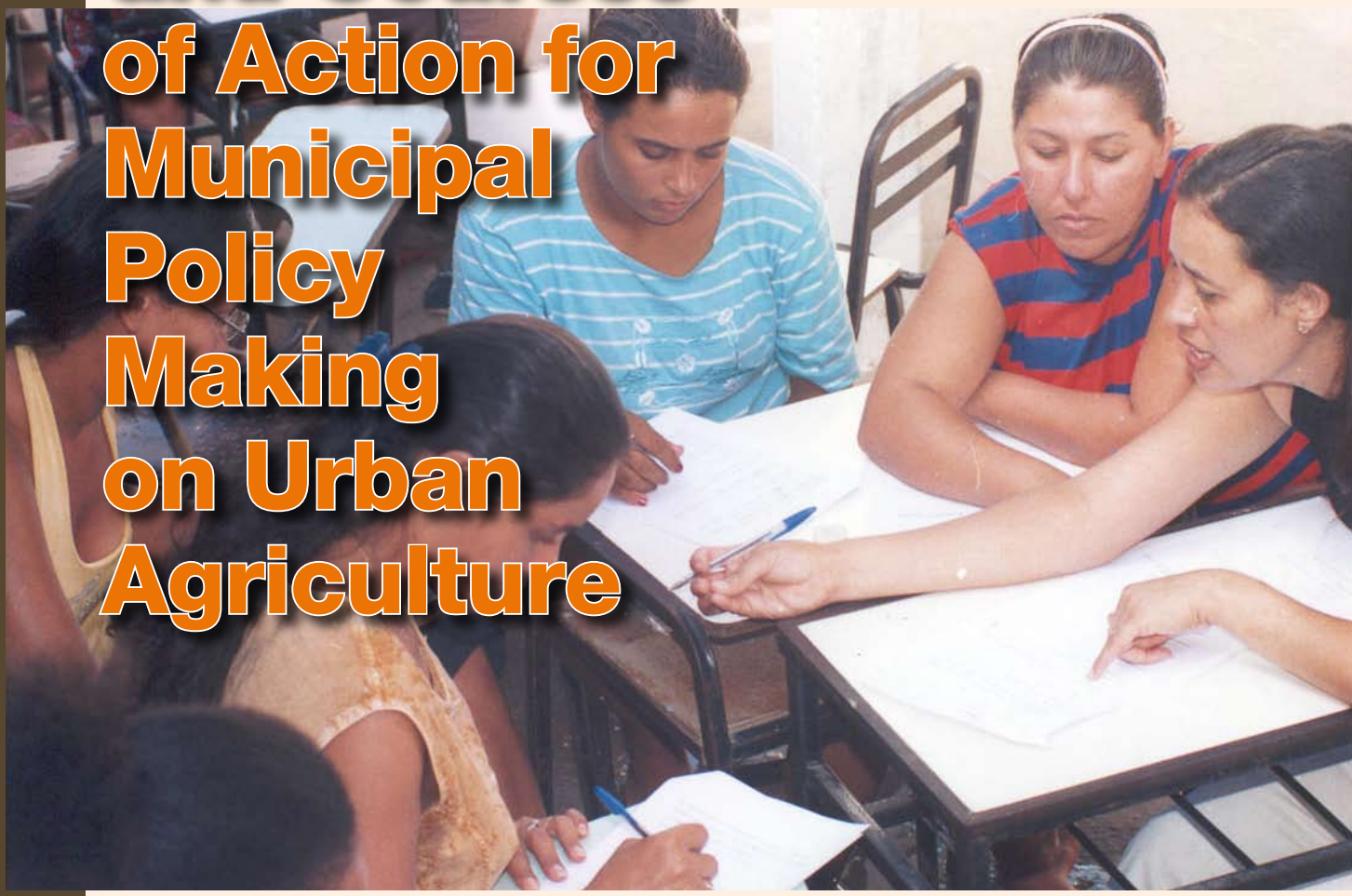
Resource centres on urban agriculture & food security

RUAF WORKING PAPER SERIES

Key Issues and Courses of Action for Municipal Policy Making on Urban Agriculture



Henk de Zeeuw, Marielle Dubbeling, René van Veenhuizen and Joanna Wilbers

Working Paper 2

The RUAF Working Paper Series

The Resource Centres on Urban Agriculture and Food Security (RUAF), in the Cities Farming for the Future (CFF) Programme, facilitate joint learning within the RUAF partnership and share experiences with others interested in the subject.

The working paper series have the following aim:

- to facilitate exchange and systematisation of the experiences;
- to improve and further develop existing RUAF working materials (like the training materials developed at the start of the CFF programme) on the basis of the lessons learnt during implementation and by integrating materials developed in the regions;
- to prepare step by step a final product of RUAF-CFF.

The RUAF working papers represent important aspects of the RUAF approach, which cover the main elements of the process of Multi-stakeholder Policy formulation and Action Planning (MPAP) and major RUAF focus themes

The documents focus on mid level staff of organisations interested to engage in urban agriculture and MPAP-process as a organiser or facilitator, a working group or forum member, a trainer, etcetera and development organisations and universities active in this field. For some of the working papers there might be additional specific audiences.

This is the second Working Paper in this series.
The first Working Papers is:
- Multi-stakeholder Policy Formulation and Action Planning on Urban Agriculture.

RUAF Foundation
RESOURCE CENTRES ON URBAN AGRICULTURE & FOOD SECURITY

© PO Box 64, 3830 AB Leusden, The Netherlands
Tel: +31-33-4326039, Fax: +31-33 4940791
Email: ruaf@etcnl.nl, Website: www.ruaf.org

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RUAF Foundation
RESOURCE CENTRES ON URBAN AGRICULTURE & FOOD SECURITY

Working Paper Series

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The RUAF Foundation

The RUAF Foundation is an international network of 8 Resource Centres on Urban Agriculture and Food Security (7 regional and 1 global one: see on the back page). The RUAF network was formed in 1999. The RUAF partners share a common vision on he role of urban and periurban agriculture in urban poverty reduction and enhancing food security a/o and together implement the international RUAF programme.

In the first phase of the RUAF programme (**RUAF I**, 1999-2004) the emphasis was on networking, awareness raising, documentation of experiences, stimulating exchange and debate, and establishment of regional resource centres on urban agriculture. The increasing capacity and development of the RUAF network resulted in March 2005 in the legal establishment of an independent organisation, the RUAF Foundation.

In the second phase of RUAF, the **Cities Farming for the Future programme** (RUAF-CFF, 2005-2008), the focus has shifted to development of regional training and planning capacities and facilitating multi-stakeholder policy making and action planning. The RUAF-CFF activities are taking pace in 20 pilot cities in 15 countries.

The RUAF Foundation aims to contribute to urban poverty reduction and local economic development, enhanced urban food security and to stimulate participatory city governance and improved urban environmental management, by creating enabling conditions for the development of sustainable urban and periurban agriculture.
They seek to do so by capacity development of local stakeholders, strengthening local producers' organisations and facilitating the integration of urban agriculture in policies and action programmes of local governments, civic society organisations and private enterprises.

The main strategies applied by the RUAF-CFF programme are:

- Establishment a Multi stakeholder platform on urban agriculture and food security in each of the 20 pilot cities, that coordinates the formulation and implementation of a Municipal Policy and/or Strategic Action Plan on Urban Agriculture with active participation of urban producers (men and women)
- Enhancing the regional capacity to deliver gender sensitive training on urban agriculture and multi-stakeholder planning of policies and projects on urban agriculture has been enhanced
- Enabling that the organisation and institutions involved in the Multi-stakeholder Platforms use participatory and gender sensitive methods for situation diagnosis, planning and monitoring and evaluation;
- Improving access of various categories of local stakeholders to information on urban and periurban agriculture that is well adapted to their needs.
- Consolidation of the seven regional Resource centres on Urban Agriculture and Food Security (RUAF's) and strengthening their capacities to provide information, training and advice on urban agriculture in their region.
- Promoting gender mainstreaming in urban agriculture is being promoted by all RUAF partners

In the next phase of the RUAF programme, titled "**From Seed to Table**" (**RUAF-FSTT**, 2009-2010) the processes set in motion in the pilot cities during RUAF-CFF will be continued with a specific focus at strengthening urban producer organisations and enhancing their capacities to engage in participatory technology development, micro-enterprise development (in production and processing), marketing and chain development.

Main funding organisations of the RUAF programme are DGIS (the Netherlands) and IDRC (Canada).

Introduction

Once governmental authorities and support institutions (public, non-profit, private) better understand the benefits and risks attributed to urban agriculture as well as the contributions it can make to some of their policy goals, they often seek to facilitate the development of urban agriculture by means of pro-active policies and intervention strategies that enhance the socio-economic and nutritional benefits of urban agriculture, while reducing the associated health and environmental risks.

Policies and interventions to support urban agriculture may be oriented at poverty alleviation, improving food security, local economic development, community building, environmental management or seek to develop a specific combination or succession of them (with different target groups or zones of the city in mind). For example, a local government concerned about growing food insecurity or the exclusion of certain groups of citizens will probably focus on the food security and social dimension of urban agriculture. Cities that are emphasising local economic development will focus on the economic dimension of urban agriculture or seek to stimulate subsistence farmers to move into the market sector. Local authorities concerned about the living climate, growing waste management problems or the negative environmental or health effects of some types of urban agriculture may concentrate on the environmental dimension of urban agriculture, or seek to promote a (policy) shift from high-input commercial agricultural production to sustainable and multi-functional agriculture.

This working paper will first outline how urban agriculture can contribute to the various policy goals mentioned and will shortly describe 4 types of policy instruments that can be used for urban agriculture. The main body of the paper will then present a series of key issues to be considered in formulating policies and intervention strategies related to urban agriculture and possible courses of action for each of these issues. The issues include:

1. Creating a conducive policy environment for urban agriculture and its formal acceptance as an urban land use;
2. Enhancing access to vacant urban land and land tenure security;
3. Delivering adequate support services to enhance the productivity and economic viability of urban agriculture;
4. Promoting gender equity and social inclusion, and
5. Taking measures to reduce the health and environmental risks associated with urban agriculture.

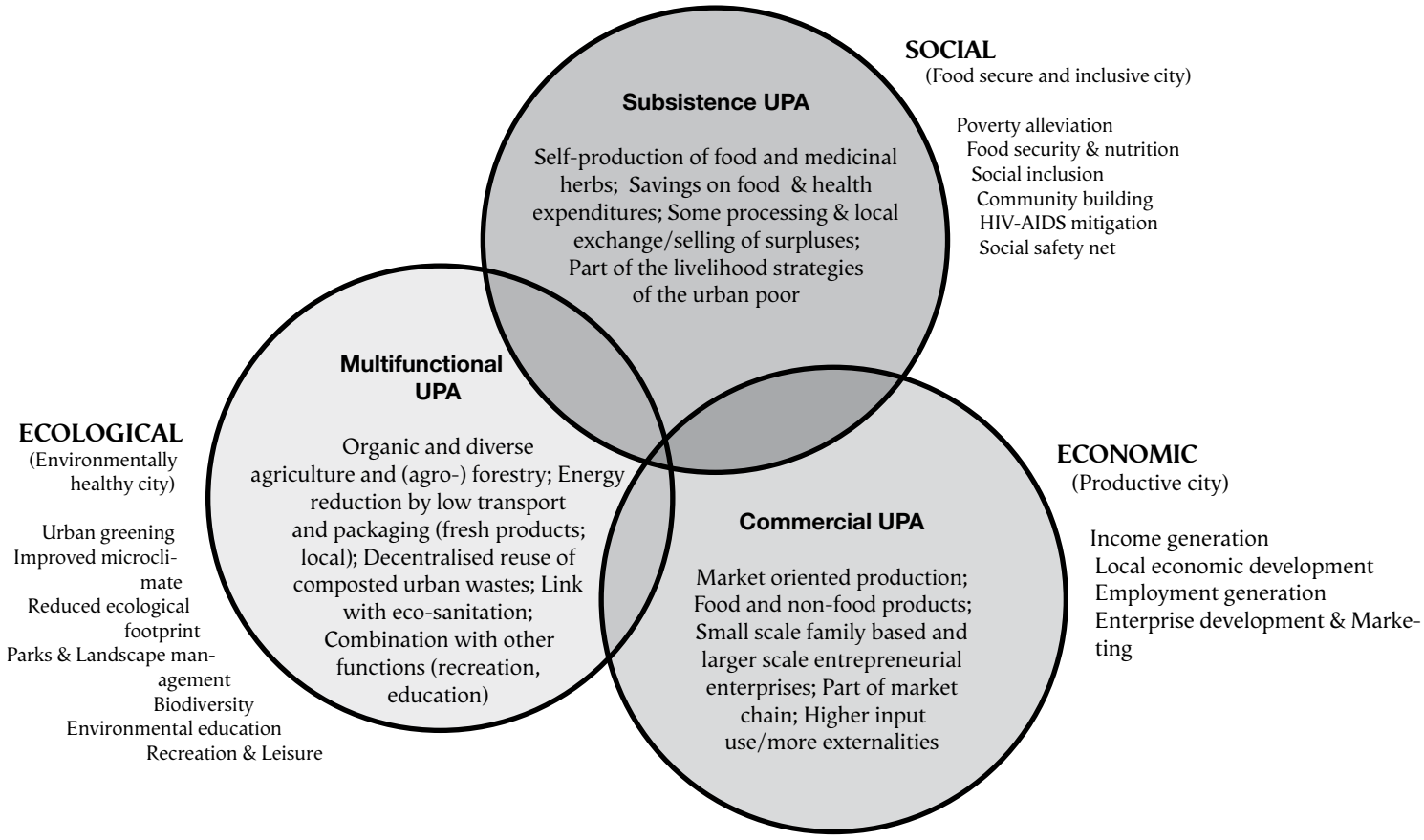
Throughout the paper, courses of action will be illustrated with concrete examples. We hope that their experiences will stimulate readers to support policy development on urban agriculture in their cities.

Contribution of urban agriculture to various policy goals

Urban agriculture can be defined as "An industry located within (intra-urban) or on the fringe (peri-urban) of a town, a city or a metropolis, which grows and raises, processes and distributes a diversity of food and non-food products, (re-) using largely human and material resources, products and services found in and around that urban area, and in turn supplying human and material resources, products and services largely to that urban area." (Mougeot, 2000).

Urban agriculture is a dynamic concept that comprises of a variety of farming systems, ranging from subsistence production and processing at household level to fully commercialised agriculture. Urban agriculture exists within heterogeneous resource situations, e.g. under scarce as well as abundant land and/or water resource situations and under a range of policy environments that can be prohibitive or supportive to its existence and development. It is necessary to improve our understanding of the links between urban agriculture and various policy target areas, such as the alleviation of poverty, economic development, or environmental policies (see Figure 1), so as to justify the inclusion and mainstreaming of urban agriculture into municipal policies and public support programmes, as well as the financing there of. Urban agriculture policies are, according to its different contexts, parts of municipal policies for different reasons, considering their contribution to making the city more food-secure and inclusive, more productive or more ecological. And this in turn allows urban agriculture to be linked to a broader sustainable development perspective that is based on similar elements, i.e social, economic and ecological sustainability (Cabannes, 2006).

Figure 1: Main Types and Policy Dimensions of urban agriculture



Henk de Zeeuw, ETC Urban Agriculture/RUAF (2007), Based on Cabannes and Dubbeling (2005)

URBAN AGRICULTURE AS A MEANS TO A FOOD SECURE AND INCLUSIVE CITY

Urban agriculture can be part of a *poverty alleviation policy* that sees in urban agriculture a means to mitigate the effects of poverty and enable *social inclusion*. The main aim here is to ensure a **food secure and inclusive city** (Cabannes, 2006). In this case, urban agriculture plays a part in a subsistence economy, generally family based, and is seldom monetarized. This activity does not generate a mayor cash surplus but provides for food or medicinal plants, reducing the expenses of the family and improving diet and access to medicine. This contribution of urban agriculture to *food security and healthy nutrition* is probably one of its most important assets.

Food production in the city is in many cases a response to inadequate, unreliable and irregular access to food, and the lack of purchasing power, and constitutes an important part of people's livelihood strategies. Food and fuel purchases already absorb a large share of the urban poor households' incomes, and while the costs of supplying and distributing food from rural areas to the urban areas or to import food for the cities, are rising continuously, it is expected that urban food insecurity will increase (FAO, 2004), especially in situations were rural-urban relationships are weak or non-existing or where rural production and supplies to cities are buttressed in situations of crop failures and civil upheaval.

It was in this context that the Honorable J.L. Nkomo, Minister of Special Affairs in the Office of the President and Cabinet, Zimbabwe, remarked "*that rural production alone cannot secure national food security. The cost of producing food is on the increase and so is the cost of transporting food from rural homes to the urban areas and hence the importance of urban agriculture in promoting food security.*" (Mushamba, S., T. Mubvami, N. Marongwe, K. Chatiza, Report of the Ministers' Conference on Urban and Peri-Urban Agriculture: Prospects for Food Security and Growth in Eastern and Southern Africa, Municipal Development Programme (MDP), Harare, 2003).

Food security is not just a concept related to the availability of food. For households it means having equitable and affordable access to food according to various criteria of quality, quantity, hygiene and cultural preferences. Urban agriculture may improve both food intake (improved access to a cheap source of principally vegetables and proteins) as

Morning glory an important components of Hanoi's diet (photo: William Leschen).

well as the quality of the food may improve. Leafy vegetables, fruits, milk, fish and poultry are important sources of vitamins and micro-nutrients critical to a healthy diet. In **Cagayan de Oro** (the Philippines), urban farmers were found to generally eat more vegetables than non-urban farmers of the same income group, and also more than consumers from a higher income group (who are found to consume more meat. 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 (de Zeeuw, 2004).

Many tasks outside the farm are performed by the women (photo: Gunther Merzthal).

Municipal authorities have much to do, in a direct and indirect way, with food security; for example in the promotion, regulation and control of commercialisation, processing and production of food products. Decisions on how to manage available resources (specifically land, water and wastes) and how local governments intervene in this management, affect, positively or negatively, the access poor households and other vulnerable groups have to food. Such policies may take special importance during crisis, and support to urban agriculture can be part of a crisis mitigation strategy and *social safety net*. This is illustrated clearly, not only in Cuba –in face of the crisis generated by the economic embargo imposed by the United States, but also in the city in **Rosario** (Argentina). The optimization of vacant land and its transformation into cultivable land was a strategy to face the dramatic effects of the economic collapse of the country in December 2000 and the social turmoil that resulted from an increase of poverty to levels never achieved before (Dubbeling , 2004).

While urban agriculture proponents note its value to all city residents, urban agriculture also functions as a direct strategy for poverty alleviation and *social inclusion* among disadvantaged groups (such as immigrants/ refugees/asylees, HIV-AIDS affected households, the disabled, female-headed households with children, elderly people without pensions, youngsters without jobs) by integrating them more strongly into the urban network, and thus providing them with a decent livelihood. Many experiences show extensive evidence of how urban farming repeatedly accommodates the inclusion of discriminated or marginalised communities - women, children, the poor, the homeless, the sick and the elderly - into constructive food production activities, providing them with fresh food, additional income, wider social contacts, political and organizational skills, renewed self-respect, as well as greener living environments. Thus many projects set up around *community building* are deliberately tailored to the nutritional, social or economic needs of a specific social group. Urban farming within or at the edge of a city brings members of that location together, generating collective action around the organization, planning and implementation of a project, sharing in the success or failure of the project, and often creating bonding and bridging networks that did not exist before (Bailkey, van Veenhuizen and Wilbers, 2007).

Most data available on the contribution of urban food production to urban household and city supply were collected in the 1990s and drawn from non-official surveys. Urban agriculture is almost never included in official statistics, not to say differentiated as a distinct source of agricultural production. Surveys also have been implemented using a variety of methods and indicators (such as the degree of stunting in young children, daily food intake related to the minimum number of calories required for an average person, the level of inequality in access to food) that make comparison among data very difficult. It is however possible to give some examples of production data (metric tons/year), as well as consumption data (% of total supply to household or city consumption), since these data are most commonly referred to in different reports, as tabulated below in Table 1. It is important to state however that these data should mainly be used to show general trends and tendencies as to highlight the relative importance of urban agriculture production to total food supply. A more systematic effort is needed to improve the periodicity and consistency of monitoring of urban agriculture production (Mougeot, 2005).

Table 1: Contribution of urban agriculture to urban food supply in various cities and countries in production supplied (metric tons/year) and % of total household or city supply.

City	Weight supplied (metric tons/year)	% Total supply (city or households)	Source
AFRICA			
ACCRA Ghana 1997	211 000 t vegs (1996) 66 500 t vegs (1992)	- 90% fresh vegs/ city - (7.5–66% total food value for producers)	- Armar-Klemesu, 2000: 104; Dreschel et al. 1999: 28 - Armar-Klemesu & Maxwell, 2000:194
ADDIS ABABA Ethiopia 1999	34.6 m l/a milk	- 79% milk/ city - 30% of vegetables	- Tegegne et al, 2000: 24 - Getachew, 2002
ANTANANARIVO Madagascar		90% leafy vegs/ city (grown by 50% households)	Moustier, 1999: 47
BANDIM Guinea Bissau		31–68 % vendors sell vegs self-grown, city	Lourenço-Lindell, 1995: 8
BISSAU Guinea Bissau		90% leafy vegs, city (grown by 30% households)	Moustier, 1999: 47
BRAZZAVILLE Congo		80% leafy vegs/ city (grown by 25% households)	Moustier 1999: 47
DAKAR Senegal	64 000 t vegs	- 60 % of vegetables consumed are produced in the city - Urban poultry production amounts to 65–70 % of national demand - 60% of milk consumed in Dakar is produced in and around the city. - UA contributes to ca. 10% total food consumption by households	Mbaye and Moustier, 2000: 243–4
DAR ES SALAAM Tanzania 1996		- 90% leafy vegs/ city - 60% of the city daily milk supply is derived from urban and peri-urban livestock production (16% from intra, 44% from peri-urban systems) - 20–30% of food consumption in 50% of households	- Stevenson et al., 1996; - Jacobi et al. 2000: 268 - Sawio, 1993
HARARE Zimbabwe		- 60% of food consumption in 25% of poor city households	Armar-Klemesu, 2000: 104
KAMPALA Uganda		- 20% of staple food consumption, households - Urban producers obtained 40-60 % of their household food needs from their urban gardens - 70% of all egg and poultry products consumed in city is derived from urban and peri-urban poultry farms - 60 +% of food for 32% of households	- Maxwell, 1994:49 - Maxwell and Zziwa, 1992 - Idem - Maxwell, 1995: 1672
KUMASI Ghana	150 t/day of fish from farms	13. 000 street food kiosks supplied with urban cattle meat/city	Dreschel, et al., 2000: 25
NOUAKCHOTT Mauritania, 1997	11 700 t fruits/vegs	18 % vegs & fruits, city	Gueye & Sy, 2001: 30

City	Weight supplied (metric tons/year)	% Total supply (city or households)	Source
LATIN AMERICA AND THE CARIBBEAN			
CIENFUEGOS Cuba	In 2002: 63.431 tons of vegetables, grains and root crops		Socorro, 2003
LA HABANA Cuba 2000 1996	150–300gr/p/d vegs-herbs 160 000 t foodstuff (44 243 t in 1995) 3650 t meat 7.5 m eggs 4 m cut flowers		Cruz and Sanchez, 2001: 4 Gonzalez & Murphy, 2000: 338 Altieri et al., 1999:139
ASIA			
CAGAYAN DE ORO Philippines, (0.5 m) 1995		70% fish (marine)/city	Potutan et al., 2000: 419
HANOI Vietnam		80% of fresh vegetables, 50% of pork, poultry and fresh water fish, and 40% of eggs /city	Nguyen Tien Dinh, 2000
JAKARTA Indonesia, Aug 1999	5671 t produce (grown on vacant lands)		Purnomohadi, 2000
SHANGHAI China	1.3 m t vegs (4000 t/d)	60% of the city's vegetables, 90% eggs/city, 100 % of the milk/city, and 50% of the pork and poultry meat /city, 10 % honey, city	Yi-Zhang and Zhangen, 2000
(EASTERN) EUROPE			
LONDON United Kingdom	- 27 t honey (worth BRP 15.7 m) - 232000 t fruits/vegs (est.)		- Garnett, 2000: 488 - Armar-Klemesu, 2000: 104
SOFIA Bulgaria 1996-1997	15 400 t market vegs 17 155 l milk 5920 t pig/beef meat 23 812 000 eggs		Yoveva et al., 2000: 507–8
ST PETERSBURG Russia (5 m) 1998	15 800 t potatoes 47 400 t apples, pears, 38 500 t vegs 7 900 t strawberries 23 m cut flowers		Moldakov, 2000:24
URBAN BULGARIA (WHO) 1998		47 % vegs/fruits, city	Pederson & Robertson, 2001:10
URBAN POLAND (WHO) 1997	500 000 t vegs/fruits (from 8000 council gardens)		Pederson & Robertson, 2001:10
URBAN ROMANIA (WHO) 1994 1989		- 37 % of household food supply - 1994 - 25% of household food supply- 1989	Pederson & Robertson, 2001: 10
URBAN RUSSIA (WHO)		88 % potatoes/city	Pederson & Robertson, 2001:10

Source: Data tabulated or calculated from official census and field samples provided Luc Mougeot, IDRC (Mougeot, 2005).

URBAN AGRICULTURE AS A MEANS TO A PRODUCTIVE CITY

Urban agriculture policies can also be part of a *local economic development policy* that focuses on *income generation* and *employment creation,* for a whole range of producers, not only home-based or community-based and not necessarily poor. In this case the rational for urban agriculture is its economic value and its capacity to generate local economic development. The main aim is to achieve a **productive city**, one in which produce from outside the city is substituted by locally-grown produce (Cabannes, 2006).

Commercial urban agriculture may constitute the primary source of income of urban residents. Commercial urban agriculture can range from individual or family based agriculture, to micro-enterprises or through larger cooperative or producer associations. In those market oriented activities, the products are sold by the producers directly, at markets or through intermediaries. To a lesser extent, products are dispersed through formal distribution markets, selling at supermarkets and green grocers. Growing ones' own food saves household expenditures; poor people in developing countries generally spend a substantial part of their income (50 – 70%) on food. Selling produce (fresh or processed) brings in cash. In this way, urban agriculture thus contributes to *income generation and job creation*, of a whole range of producers.

Besides the economic benefits for the urban agricultural producers (through sale and savings), urban agriculture stimulates the *development of related micro-enterprises*: the production of necessary agricultural inputs (like the collection and composting of urban wastes, production of organic pesticides, fabrication of tools, delivery of water, buying and bringing of chemical fertilisers, etc.) and the processing, packaging and *marketing* of outputs. The activities or services rendered by these enterprises may owe their existence in part or wholly to urban agriculture. Other services may also be rendered by independent families and groups (e.g. animal health services, bookkeeping, transportation).

Data available –again mostly from the 1990s- indicate that urban agriculture may represent a sizeable source of employment and income (See below Table 2). Urban agriculture has shown to be a primary or secondary source of income to many urban families. Incomes and wages from urban agriculture tend to compare favourably with those of unskilled construction workers. They are often larger than those of mid-level civil servants Data also indicate the (ten) thousands of producer or households may be engaged in different forms of urban agriculture production at any given time. Income and employment generated by urban agriculture related enterprises is not even considered (Mougeot, 2005). The municipality and sectoral organisations can play a crucial role in stimulating micro-enterprise development and marketing related to urban agriculture. Access to affordable credits and credit conditions is crucial at that stage, specifically concentrating on agro-processing and/or marketing of urban agriculture produce. Between 1995-1998, the Verticalização da Pequeña Produção (PROVE) program in **Brasilia** (Brazil) supported the establishment of more then 100 agroindustries, that created more then 700 jobs allowing people to earn up to 4 times the minimum wage. In **Cuenca** (Ecuador), the municipality has provided marketplaces for urban farmers. The organic refuse left after a market day is collected by a women's group who compost the refuse for sale. A true win-win situation.

Table 2: Contribution of urban agriculture production to urban employment, income and food expanse savings.

City	Producers (self-provision, market)	Economic return (income, savings)	Source
AFRICA			
ACCRA Ghana, 1997	13.6% of households in 16 city areas 700 market farmers	income of 20 - 100 USD/month (seasonal)	Sonou, 2001: 33; Armar-Klemesu & Maxwell, 2000: 184, 193
ADDIS ABABA Ethiopia, 1999	5167 dairy units	76% of secondary city and 54% of inner Addis dairy units owned by women	Tegegne et al, 2000: 24
BAMAKO Mali, 1994		wages equivalent or higher than for. civil servants	Zallé, 1999: 9

City	Producers (self-provision, market)	Economic return (income, savings)	Source
CAIRO Egypt, 1995	16% households (livestock) -59% of whom are poor	livestock assets exceed 2–3 times monthly capita income	Gertal & Samir, 2000:215
DAKAR Senegal, 1996	15 000 + jobs 3000 family veg farms (14000 jobs) ca 1250 commercial veg farms (9000 job) 250 poultry units		Mbaye & Moustier, 2000: 246
DAR ES SALAAM Tanzania	15–20% families homegarden (2 areas)	- UA forms at least 60% of the informal sector and is second largest urban employer (20%); - 30% of average salary (full-time prod); - 35 000 households depend on fruit/veg production for income; - Urban fresh milk production was worth an estimated USD 7 million in 1993. The annual gross output of over ten thousand UA enterprises totalled 27.4 million USD, with an annual value added amounting to 11.1 million USD.	- Personal communication Mr. Majani UCLAS, Dar es Salaam, 2001 - Nugent, 2000: 76 - Jacobi et al., 2000: 264 - Sawio 1998
HARARE Zimbabwe	42 % of households involved in off-plot production	- 2 weeks - 7 months min industrial wage (savings); - Savings accruing to small-scale urban farmers are equivalent to more than half a month's salary	- Mbiba, 1995: 61 - ENDA-ZW, 1997 - Sanyal, 1996
KAMPALA Uganda	- Approximately 30% of the households in Kampala City are engaged in UA, 75% of which are female headed households; - 2% of the farming activities are located in institutions (schools, prisons, army barracks, religious institutions, and higher institutions of learning)	45% of household heads reported livestock keeping as their most important secondary activity with 38% relying on livestock production as a source of income.	Muwanga 2001 DFID/NRI, 2002
KUMASI Ghana, (0.7 m)	1470 registered farms (+ 30 000 unregistered) 500 ft cattle owners (+ 200 pt) 100 registered poultry farms (+ 200 unregistered)	14% of cattle owners drew 50%+ of income from cattle	Dreschel et al., 2000: 25; Poynte & Fielding, 2000: 28
LOME Togo		net wage from market vegetable production equivalent to mid-level manager in civil service	Kouvonou et al, 1999: 98
LUSAKA Zambia		savings equivalent to 3 months worker's wage (seasonal)	Drescher, 1999
NAIROBI Keny, 1994	150 000 households (30 population)	In the early 1990s, agriculture provided the highest self-employment earnings among small-scale enterprises and the third highest earnings in all of urban Kenya.	Foeken & Mwangi, 2000: 307, 314

City	Producers (self-provision, market)	Economic return (income, savings)	Source
NAKURU Kenya, (0. 24 m) 1999	20% households (livestock) (14% low income - 38% high income) majority women		Foeken & Owuor, 2000: 20
PORT SUDAN Suda, (0.8 m) 1999	23% households (goats) - Beja		Pantuliano, 2000: 15
THIES Senegal, 1998	70 000 poultry market farmers		Touré et al.2001: 19
LATIN AMERICA AND THE CARIBBEAN			
CIENFUEGOS, Cuba		1995-2003: 17.000 jobs generated	Socorro, 2003
GOVERNADOR VALADARES Brazil, 2003	45 % of population practice a form of UA	1,17 % of city GDP	Lovo & Suares, 2003
LA HABANA Cuba, 1998	117 000 direct and 26 000 indirect jobs		Gonzalez & Murphy, 2000: 334, 344
MEXICO CITY Mexico 1990–1996	1.3 — 19 % EAP in some zones of the cit	10–40% household income (swine); up to 100% HH income (milk); 10–30 % HH income (maize); 80 % HH income (veg); 80% + HH income (ornamentals); 100 % HH income(nopal, tuna)	Torres et al., 2000
ROSARIO Argentine	10.000 families involved in urban farming	More then 350 farming groups (representing ca. 3500 families) involved in marketing obtaining a monthly income ranging between 40.00$ and 150.00$ USD (The poverty line is estimated at 90 USD).	Dubbeling, 2004
SANTIAGO Dominican Republic (0.5 m) 1997		40% + min. salary	del Rosario et al., 2000: 99
ASIA			
CAGAYAN DE ORO Philippines 1995 1997	13 000 jobs (farmers and tenants) 40% households 96% public elementary schools 1397 fishermen		Potutan et al., 2000: 419
CALCUTTA India, 2000	17 000 jobs in wetland fisheries		Edwards 2001: 20
JAKARTA Indonesia, 1999	100 234 owners & workers	wage higher than for unskilled const work	Purnomohadi, 2000: 454, 457
SHANGHAI China, (13 m)	2.7 m farmers (31.8% workers)	2% of city GDP	Yi-Zhang & Zhangen, 2000: 467,468

City	Producers (self-provision, market)	Economic return (income, savings)	Source
(EASTERN) EUROPE			
LONDON United Kingdom	3 000 jobs 1000 bee-keepers 30 000 allotment holders 77 community gardens 50% population home-gardens	BRP 3 m fruits/vegs	Garnett, 2000: 478
MOSCOW Russia, 1999	65% families (20% in 1970)		Deelstra & Girardet, 2000: 46
SOFIA Bulgaria, 1997	13 400 workers (official)	28% households get some income	Yoveva et al., 2000: 509

Source: Data tabulated or calculated from official census and field samples provided Luc Mougeot, IDRC (Mougeot, 2005).

URBAN AGRICULTURE AS A MEANS TO AN ENVIRONMENTALLY HEALTHY CITY

Urban agriculture is in other cases part of an integrated *environmental policy*, with its main benefit being the *greening* of the city, increasing citizens' access to nature, *recreation* and *leisure* and their awareness of their environment. Increasing the access to a healthy environment or *reducing the ecological footprint* are both dimensions of an **environmentally healthy city** (Cabannes, 2006).

If well planned and integrated into urban design, urban agriculture (and specifically urban forestry or tree culture) can help to improve the physical climate. The production of trees, shrubs, flowers, and ornamental plants and food crops can beautify the city, cool its climate, curb erosion and absorb air pollution and odours. Urban agriculture can also positively increase *biodiversity* through ecological, divers and associated production systems. (Deelstra and Girardet, 2000).

Urban agriculture can support the sustainable management of vacant and risk-prone land and water areas by applying specific production techniques and optimising productive use of lands not suitable for construction (steep slopes, roadsides, and water harvesting areas). Urban agriculture may also contribute to cleaning of the city by turning derelict open spaces and vacant land areas into productive and green zones.

Another key factor in urban ecology is the process of *waste management* and nutrient recycling. Urban agriculture can contribute hereto by turning urban wastes into a productive resource. Recycling waste and sewage sludge reduces the difficulty of disposing of solid wastes, replaces the use of expensive chemical fertilizers and prevents soil degradation, contamination and erosion in the agricultural areas. An increasing number of urban and peri-urban farmers use urban wastewater (treated, partially treated and untreated) for irrigating their farms when they lack access to other sources of water or because of the high price of water from other sources. It is estimated that one tenth or more of the world's population currently eats food produced on waste water (although not always in a safe way) (de Zeeuw, 2004).

Urban and peri-urban farms take on an important role in providing recreational opportunities for citizens (recreational routes, food buying and meals on the farm, visiting facilities) or having *educational functions* (bringing youth in contact with animals, teaching about ecology, etc.). In more developed cities, urban agriculture may be undertaken for

Children proudly display the vegetables grown in the Kid's Garden program at Troy Gardens (photo: Friends of Troy Gardens).

the physical and/or psychological relaxation it provides, rather than for food production per se. Finally, urban agriculture contributes to reduction of the ecological foot print of the city and reduction of energy use for transport, packaging, cooling, etcetera, by producing fresh foods close to the consumers.

However, urban agriculture may also have negative health and environmental effects if certain associated risks are not taken into account and proper preventive and guiding measures have not been taken. Crops can be contaminated with pathogenic organisms (for instance, bacteria, protozoa, viruses or helminths), due to irrigation with water from polluted streams or with insufficiently treated waste water or organic solid wastes. Crops can be contaminated by the uptake of heavy metals from contaminated soils, air or water. Certain diseases (bovine tuberculosis, pig and beef worm, trichinosis, anthrax, salmonella and campylobacter) can be transmitted to humans by livestock kept in close proximity to them, if proper precautions are not taken (de Zeeuw and Lock, 2003).

The challenge for much of urban agriculture practiced by the urban poor and others is for it to become an environmental benefit rather than a liability, and to be seen in this light by authorities. Because poor urban producers operate illegally, on marginal and often hazardous sites, with limited means and assistance, their practices are often unsustainable, if not aggressive, posing risks to their own health, that of their family and consumers. It is thus argued that integration of urban agriculture in physical planning and design while assuring secure tenure –specifically to the urban poor and vulnerable groups- should be promoted as an alternative approach to existing slum upgrading activities promoted by UN-HABITAT, the World Bank and others. Identification, definition and activation of green fields, spots and spaces for urban agriculture purposes in the informal settlements could be a coherent spatial device tool for managing environmentally and socially more sustainable urban growth. These green and productive spaces could be the structuring element around which the new city and neighbourhood develops. Waste(water) recycling can be integrated in management of green and productive areas. The productive or potentially productive areas of the city that have not been paved over are not limited to communal farms and private gardens. Riverbanks and roadsides, parks, lands under high-voltage electrical towers that cannot be used for buildings for example make up much of a municipality's territory. Planning the use and exploitation of these spaces requires legitimising urban agriculture as an urban land use and including it in urban development plans and be regulated by municipalities. Taxation rules and legal frameworks are also necessary to provide tenure security and incentives for producers (Cabannes and Dubbeling, 2002).

Urban producers network in Lima (photo: Noemi Soto IPES).

Policy instruments for urban agriculture

As a result of these potential contributions of urban agriculture to a variety of policy goals, a growing number of cities, local governments and other actors have recognised the importance of urban agriculture and are designing new urban agriculture policies or are reformulating existing ones.

Before giving examples of such policies and courses of action (&3), we first would like to indicate what policy instruments can be applied to realise the set of objectives stipulated by the city. Cities (and national governments) have in general four types of policy instruments available that can be applied to support urban agriculture development. Contrary to what many people seem to believe, legislation is just one of the available policy instruments. Other instruments include: economic, communicative / educative and urban planning & design instruments. Each instrument is based on a specific hypothesis regarding how behaviour of actors in society can be influenced.

LEGAL INSTRUMENTS

The logic underlying legal instruments is that actors (such as citizens or industries) can be forced to adopt a certain desired behaviour through legal norms and regulations (like norms, laws, bye-laws, ordinances, etc.) and that it is possible to control whether these actors adhere to the given rules and norms. Actors who do not adhere to the rules will be sanctioned. This policy instrument is especially useful in cases when: 1) the desired behaviour cannot be realised in another way; and 2) the rules can easily be controlled. In addition legal instruments are used in case the other instruments (economic, educational and design) require an adequate legal basis. As such, the urban agriculture programme in **Governador Valadares** (Brazil), for example, was formalised by law.

The most common problems with the application of legal instrument are the following:

- An increasing number of laws, bye-laws, regulations, etc. may lead to contradictions (what is allowed or promoted in one law or regulation may be prohibited or restricted in another). This situation regularly occurs regarding urban agriculture due to its multi-sectoral character (e.g. a recent city urban agricultural policy supports urban agriculture while the cities' environmental or health regulations still forbid or severely restrict it),
- The mechanisms to enforce legal instruments are often weak due to the related costs and/or lack of political will, leading to a low level of control and sanctioning of undesired behaviour and/or to unequal treatment of the various actors (some are sanctioned while others are not; the latter are often the more powerful or influential people). Such a situation (prohibited in law, but tolerated in practice) is quite common as far as urban agriculture is concerned especially in cities in Sub-Saharan Africa.

An alternative legal instrument to issuing general bye-laws, norms and regulations, is the contract or covenant. The government and certain actors sign an agreement in which the social actors (e.g. urban farmers' organisations) agree to adhere voluntarily to certain norms and regulations, often in exchange for certain support by local government or other organisation (e.g. access to municipal land, obtaining a license for a farmers' market, technical support, etc.). Whereas a municipal bye-law or ordinance generally contains do's and don'ts that should be adhered to by -in principle- all citizens, the covenant is an agreement voluntarily made between local government and specific actors in a city, and that applies to (and by) only those groups. This makes it possible to establish more specific norms and regulations for specific situations or specific groups of actors.

ECONOMIC INSTRUMENTS

The logic behind the application of economic instruments is the assumption that social actors will adopt a certain desired behaviour if this gives them some economic gains (or losses if they continue with the undesired behaviour). Local governments for example may grant tax incentives or subsidies if actors adopt the desired behaviour or levy special taxes for undesired behaviour (similar to the levy on cigarettes or alcohol). Such economic instruments also need a legal basis (see above), but the essential element here is not the law itself but the economic incentive or loss that orients (or is supposed to orient) a certain behaviour.

Several municipalities already grant tax exemptions to land owners who allow poor urban farmers use of vacant private land (see for example the municipality of **Governador Valadares** exempting -as per the law N° 5.265- private land owners from progressive property taxation if their lands are put to productive use). Others have reduced the tariffs for irrigation water or provide incentives for composting and reuse of household wastes. Economic support can also be given through supply of irrigation water, tools, seeds and compost to (poor) urban farmers.

This policy instrument is especially useful in cases when:

- the economic incentive is easily recognisable and substantial enough to have an effect,
- the economic incentive is directly related to the desired/ undesired behaviour.

The most common problems with the application of this instrument are the following:

- The costs of the policy measure cannot be controlled and may become unfeasible when many actors make use of it,
- Levies and subsidies often enhance social inequity (how to control that it are really the most vulnerable groups that benefit from the economic incentive for example?).

COMMUNICATIVE / EDUCATIVE INSTRUMENTS

The assumption behind the use of communicative/ educative types of instruments is that people will adopt a certain desired behaviour if they are well informed about the positive effects of the desired behaviour as well as the negative effects of the undesired behaviour. Accordingly, information, education and persuasion tools (media programmes, extension visits, training courses, leaflets, websites, etc.) will be applied to make people understand the importance of the desired change and to assist them in the change process. Well-known examples include media-campaigns to refrain from smoking or to promote use of preservatives when having sex. Related to urban agriculture: a municipality may provide technical training to urban farmers for example or education on healthy food, food growing and food preparation to school kids. Communicative/educative instruments are often used complementary to the other policy instruments mentioned, since the lack of an adequate communication and education strategy may strongly reduce the effectiveness of the other policy instruments used. In this context, the importance of designing and implementing a strategy to communicate municipal urban agriculture policies and policy instruments to the target group should also be underlined.

URBAN DESIGN INSTRUMENTS

The logic behind urban design instruments is that actors will adopt a certain desired behaviour if their physical environment has been designed in such a way that they are more or less automatically prompted to act a certain way: for example if public dustbins are widely available, generally people will throw less waste on the street. Examples related to urban agriculture are zoning (setting aside and protecting certain areas of the city for agriculture) , combining or separating certain land uses depending on the degree of conflict/synergy, inclusion of space for home or community gardening in social housing projects, etc. Several cities have included land designated for urban agriculture in their urban land use plan, housing or in slum upgrading projects.

CURRENT SITUATION REGARDING USE OF POLICY INSTRUMENTS FOR URBAN AGRICULTURE

Existing policy documents reveal that many cities still emphasise legal instruments, which often have a "reactive character"(action is taken only in the form of sanctions, in case legal rules and regulations are not followed properly by the social actors). In such cities urban agriculture is often restricted or at best tolerated if the capacity of the city to enforce the existing regulations is too limited. On the other hand, many examples of the use of economic, educative and design instruments can also be found (see further below), often in cities that apply a more proactive, enabling and development-oriented approach to urban agriculture. As stated above, economic, educative and design instruments have to be combined with supporting legal instruments in an effective "package" of policy measures in order to arrive at a development-oriented policy on urban agriculture.

It is the opinion of the authors that in **Kampala** (Uganda), the city policy supports urban agriculture in the sense that it is accepted as a legal form of land use under certain conditions and forms part of the city's poverty alleviation and social development strategy. However, the policy relies mainly on legal instruments (the Kampala City Ordinances on urban agriculture, fish, livestock and meat), which restrict unwanted behaviour by establishing a system of licenses, regulations, control and sanctions. From the documents, it is not yet clear how the ordinances are combined with other more development-oriented policy instruments and support measures to support and stimulate turban agriculture (training, marketing support, access to land, etc.) – though separate projects in these fields do take place in the city – and it may thus be questioned how and when the original focus on poverty alleviation will in fact be achieved. For example, the ordinances restrict urban agricultural use of certain areas to urban farmers in order to protect wetlands, greenbelts, road reserves, drainage channels and parks. These areas of land may however be the main areas of land accessible to poor urban families. While these restrictions make sense from a health and environmental point of view, they also point to the need for the further development of a policy and guidelines on land use that include urban agriculture, especially if farming is to benefit the urban poor. According to the new Ordinances, farmers also need to get an official permit or licence for farming and marketing in the city. Even if payments will remain low (and affordable), a big challenge facing municipal authorities will be winning the confidence of their constituents. Kampala citizens have already stated that they are very sceptical when it comes to permits and fees, even though the Council proposes to invest generated funds in provision of services for farmers. There is a general culture of not paying for anything, because the government normally does not give anything in return.

Kampala City ordinances are now being pilot-tested. These observations may feed the discussion in Kampala, since policy and programme development processes are still ongoing, illustrating the fact that policy change is normally incremental (step by step).

The Rosario Ordinance shows that a different approach is taken by the city of **Rosario** (Argentina), where in our opinion the emphasis is mainly on the economic and communicative/ educative instruments: Rosario has chosen an approach that focuses on stimulating good behaviour by means of positive incentives (property tax exemption for landowners, provision of seeds, water and tool sheds, farmer education and technical assistance –all financed and supported by the municipality or collaborating organisations). In our opinion, the Rosario approach is more programme-oriented, focussing on enabling approaches, while the Kampala approach is – as yet – more regulatory and focussed on punitive approaches (de Zeeuw and Wilbers, 2006).

Courses of action for municipal policy making on urban agriculture

In the foregoing chapters we have described the policy goals to which urban agriculture can contribute as well as the main policy instruments available to cities and other stakeholders supporting urban agriculture. This chapter will present five main key issues for effective policy making on urban agriculture as well as possible courses of action for each of these issues. The suggested courses of action have been identified and applied in the past decade by policy makers and practitioners in the field of urban agriculture and presented during various international and regional conferences and issue-based workshops[1].

The five key issues include the following:

- Creating a conducive policy environment for urban agriculture and its formal acceptance as an urban land use,
- Enhancing access to vacant urban land and land tenure security,
- Delivering adequate support services to enhance the productivity and economic viability of urban agriculture,
- Promoting gender equity and social inclusion, and
- Taking measures to reduce the health and environmental risks associated with urban agriculture.

Each of these issues will be discussed in more detail below.

CREATION OF A CONDUCIVE POLICY ENVIRONMENT

Revision of existing policies and regulations

Formal acceptance of urban agriculture as a legitimate use of urban land is a crucial first step towards effective regulation and facilitation of the development of urban agriculture. Existing policies and bye-laws regarding urban agriculture, as well as sector policies that include norms and regulations on issues related to health, the environment, etc. will need to be reviewed in order to identify and subsequently remove (unsubstantiated) legal restrictions that may exist.

Another essential step is to include urban agriculture as a separate land use category in land use plans and change existing zoning categories to include urban agriculture.

> *"Urban agriculture is mainly an informal activity in Maranguape, introduced to the city by migrant workers. Urban agriculture, however, has to be integrated into the municipal planning as part of the Main Urban Development Plan." Raimundo Marcelo Carvalho da Silva, Mayor of Maranguape, Brazil.*

Kampala (Uganda), **Dar es Salaam** (Tanzania), **Havana** (Cuba) and **Harare** (Zimbabwe) all recently revised or are revising their bye-laws and regulations in order to replace colonial bye-laws and international sanitation standards that were seen as excessive, unenforceable or inappropriate to local conditions.

> *"Our bye laws were outdated," admits Winnie Makumbi, Kampala City Minister of Social Improvement, Community Development and Antiquities. "They failed to recognise that many residents derive their livelihoods from urban farming. We realised it was up to us as political leaders to initiate the policy changes that would support urban farming practices."*

Adequate institutional arrangements

A second important step is the creation of an institutional home for urban agriculture. Conventionally, sector policies have been defined under the assumption that agriculture refers to the rural sphere and will be attended to by institutions other than the urban ones. However, most agricultural organisations do not operate in the urban sphere (Tacoli, 2001). As a consequence, urban agriculture still receives little policy and planning attention and development support or it suffers from conflicting

[1] Havana 1999 (DSE/CTA/GTZ/ETC-UA), Stellenbosch 2001 (FAO), Quito 2001 (IPES/UMP-LAC/IDRC/FAO) Nairobi 2002 (FAO/IDRC/Habitat/ETC-RUAF/SIUPA), Ouagadougou 2002 (CREPA/ETC-RUAF), Nairobi 2003 (NRI/MI/ETC-RUAF), E-conference 2000 (FAO/ETC-RUAF), E-conference 2001 (CGIAR-UH/ETC-RUAF), E-conference 2002 (IWMI/ETC-RUAF), E-conference 2003 (HABITAT/ETC-RUAF), Johannesburg/Cape Town 2005 (Abalimi/CTA/ETC-UA).

jurisdictions. At the same time, urban farmers are often uncertain as to which department, organisation or programme is responsible for them.

Municipal authorities can play a key role in filling this gap by:

- Selecting a leading department or institute in the field of urban agriculture; often a change in the institutional mandate of that organisation will be needed and often a special urban agriculture department, unit or office will have to be created within the leading institute. Several cities, like **Nairobi** (Kenya) and **Accra** (Ghana), have created a municipal agricultural department. In **Villa María del Triunfo, Lima** (Peru), an urban agriculture unit was created under the Department of Economic Development (with a yearly budget of US$ 35,000), while at the same time urban agriculture was included as a priority area in the Concerted Economic Development Plan (2001-2010). In **Luriganch-Chosica, Lima** (Peru) a similar urban agriculture unit was created as part of the city's Economic Development and Public Services Department. The city of **Rosario** (Argentina) made in 2001 its Secretariat of Social Promotion responsible for the coordination of the new Urban Agriculture Programme and the staff involved grew from one to several full-time workers in the last five years.
- Establishing an interdepartmental committee on urban food production and consumption to enhance coordination and institutional commitment. In **Cape Town** (South Africa), an inter-departmental working group was established in 2002 to coordinate the urban agriculture activities of various municipal and provincial departments and facilitate integrated policy development. In **Bulawayo** (Zimbabwe), an Interdepartmental Committee on Urban Agriculture was created to coordinate the activities of the various municipal departments active in this field (town planning, health, finance, etc.).

Mechanism for participation and dialogue

Participation of a wide variety of stakeholders improves the quality of the policy and programme design and enhances commitment for implementation. Therefore, it is also important to stimulate the direct participation of the (various types of) urban farmers in the policy design and action planning as well as to stimulate dialogue and cooperation between public and civil society organisations. This can be done, amongst other ways, by setting up a multi-actor platform and working group on urban agriculture that organises the joint analysis of the presence, role, problems and development perspectives of urban agriculture in the city and coordinates the process of interactive formulation of policies and the planning and implementation of action programmes by the various actors as is done in the cities under the RUAF-CFF programme (see Working paper No1: Multi-stakeholder policy formulation and action planning for urban agriculture) and many other cities.

In **Governador Valadares** (Brazil), a Municipal Forum on Urban Agriculture and Food Security was formed. The Forum consists of over 100 representatives (men and women) selected by the community. Neighbourhood associations, public schools, university and faculty members, church representatives and governmental secretariats (environment and agriculture, planning, city council representatives) also participate. A first Forum event basically served to present the results of a situational analysis on urban agriculture and identify key issues and objectives for further development of urban agriculture. In subsequent meetings a city action plan and policy on urban agriculture were developed and strategies for implementation and roles and contributions of the various actors were defined. The Forum continues to play a role in monitoring the action plan and its further development. (If you are interested in this experience, please go to optional readings, for a more detailed case study on Governador Valadares).

In **Toronto** (Canada), the Toronto Food Policy Council (http://www.toronto.ca/health/tfpc_index.htm) was set up in 1991 to involve business and community groups in the development of policies and programmes that promote urban food security and the creation of an equitable urban food system. A similar council can be found in **Vancouver** (Canada).

MEASURES TO ENHANCE ACCESS TO VACANT URBAN LAND AND LAND TENURE SECURITY

Land is a very important resource for urban agriculture[2] and its availability, accessibility and suitability for agriculture should be of particular concern to those who want to promote urban farming as a strategy for social inclusion, enhanced food security, poverty reduction and local economic development. City governments can

[2] Although not all urban agriculture is soil bound: some examples that do not involve open land are mushrooms in sheds, guinea pigs in the kitchen, hydroponics, container agriculture, roof-top farming, etc.

facilitate access of urban farmers to available urban open spaces in the following ways (for more information, see also the proceedings of the RUAF-UN Habitat E-conference "Optimising Agricultural Land Use in the City Area", 2003, at http://www.ruaf.org).

Mapping of vacant land

Contrary to common belief, even in highly urbanised areas a surprisingly high number of vacant spaces can be found that could be used for agriculture on a temporary or permanent basis. In the city of **Chicago** (USA), for example, researchers identified 70,000 vacant lots (Kaufmann and Bailkey, 2000). Various other cities, like **Cienfuegos** (Cuba), **Piura** (Peru), **Dar es Salaam** (Tanzania), **Rosario** (Argentina) and **Cagayan de Oro** (Philippines), have made an inventory of the available vacant open land in the city (using methods like community mapping and/ or Geographic Information Systems) and analysed its suitability for agricultural use, which creates a good starting point for enhancing access of urban farmers to land.

Temporary leasing of vacant municipal land

The cities of **Havana (Cuba), Cagayan de Oro** (the Philippines), **Lima** (Peru), **Bulawayo** (Zimbabwe) and **Governador Valadares** (Brazil), amongst others, have formulated a city ordinance that regulates the (temporary) use of vacant municipal land by organised groups of urban farmers.

> *"Considering the alarming rate of unemployment in the city of Rosario and the need to promote productive activities, the Municipality is committed to assigning land under contracts with farmer groups for farming purposes. Lots should have the minimal services for carrying out the proposed tasks."*
> *Pablo Javkin, Councillor Rosario Municipality, Argentina.*

Vacant municipal land might be land earmarked for future other uses (residential areas, industrial areas, hospital or school), or could be located in zones that are not fit for construction (flood zones, buffer zones, land under power lines, etc.), but may be given in short or medium term temporal lease to (groups of) urban poor for gardening purposes. In the city of **Cape Town** (South Africa), underutilised land around public facilities, road verges, etc., are leased out to groups of urban poor households. NeighborSpace in **Chicago** (USA), an organisation which is independent from but works in close collaboration with the City Council, liaises between the city (as land owner)

Private vacant land identified in Valadares (photo: Ivana Cristina Lovo).

and community gardeners who want to use the land. However, often those in need of land are not aware of such opportunities and information campaigns are an important accompanying measure.

If preparation of formal individual land lease contracts is too time and labour consuming, land might be leased out to farmer organisations rather than to individuals (the organisation will then rent out plots on an annual renewable basis to its members), or written multi-annual occupation licenses or permits could be provided rather then formal leases. This is done for example in **Amsterdam** (the Netherlands), where the local Association of Gardeners (7200 members) rents over 250 ha of municipal land from the city. The Association rents this land out as garden-plots to individual members who pay a quota of around 300 Euro per year per plot. This income allows the association to maintain fences and other infrastructure and to provide certain services to its members (e.g. training events, garbage disposal, etc.).

Often the contract with the farmers includes conditions, or in some cases restrictions, related to the required land, crop and waste management practices to be used. Some municipalities provide training on these practices to farmers. The city of **Cape Town** (South Africa) not only provides the land, but also assists in improving the quality of the land by ploughing, delivery of compost and manure, fencing, etc.

Other municipalities provide economic incentives and technical support to neighbourhood and youth groups that take action to clean up derelict and deteriorated open public spaces ("no-man's land") and turn these areas into gardens for the production of food, flowers, ornamentals, herbs, etc. In **New York** (USA), community groups and volunteers, with the help of the Department of Sanitation, cleaned out derelict open spaces in their neighbourhoods and set up community-supported gardens there (e.g. the Clinton Community Garden). A recent study revealed that the opening of a community garden leads to an increase of the prices of residential properties within 1000 feet of the garden, and that the impact increases over time, with the greatest impact being in the most disadvantaged neighbourhoods (Kami Pothukuchi, 2006).

Promoting use of vacant private lands

In order to enhance access of urban farmers to privately owned (vacant) land the Municipality of **Rosario** (Argentina) created a Municipal Agricultural Land Bank (a cadastral-based land registry) and brings those in need of agricultural land in contact with the owners of vacant land. It also hires vacant land from private landowners to lease it out to community groups interested in using this land productively.

Another effective instrument used in **Rosario** to encourage private or institutional landowners to make vacant land available to poor urban groups interested in farming is the increase of municipal taxes on idle urban land and reduction of taxes for landowners who make idle land available for (temporary) farming.

Other examples of tenure agreements between urban producers and owners of private or semi-public estates with idle areas can be found in **Lima** (Peru) and **Accra** (Ghana; hospital grounds), **Harare** (Zimbabwe; golf club), **Santiago de Chile** (Chile; school yards), **Dar es Salaam** (Tanzania; university campus), and **Port-au-Prince** (Haiti; church grounds). The Copperbelt Urban Livelihoods programme in Zambia (CARE-CULP) is playing a mediating role to create acceptable win-win situations for both landowners of vacant land and those interested in farming on this land (see also: Proceedings of the RUAF-UN Habitat E-conference "Optimising Agricultural Land Use in the City Area", 2003. http://www.ruaf.org).

The city of **Cagayan d'Oro** (the Philippines), assists associations of the urban poor in establishing (allotment) gardens on privately owned land, which has proved to be a successful strategy. The organisers have learned that it is necessary to define clear land management conditions (e.g. type of crops that can be grown, no building of structures on the land, methods of waste management) and to help the allotment gardeners learn about the required practices and how to apply them. In **Amsterdam** (the Netherlands) such conditions are included in the regulations of each garden park. All urban gardeners that rent a plot in the garden park have to adhere to these regulations.

Municipalities or NGO's mediating between landowners and poor urban farmers should promote the provision of longer-term leases, which allow producers to invest in the soil and farm infrastructure. Such leases should be for at least five years, but preferably longer. Landowners however might be more willing to agree to a longer-term lease with an association of farmers (that leases the plots to their members on the basis of annually renewable contracts), instead of with individual farmers out of fear that the latter might start seeing the land as property and will refuse to leave the plot once the lease contract ends.

Demarcation of zones for urban agriculture

Dar es Salaam and **Dodoma** (Tanzania), **Dakar** (Senegal), **Maputo** (Mozambique), **Bissau** (Guinee Bissau), **Pretoria** (South Africa), **Kathmandu** (Nepal), **Accra** (Ghana) and **Harare** (Zimbabwe) are examples of the many cities that have demarcated zones for urban agriculture as a form of permanent land use. These zones are intended to support agriculture and/or to protect open green areas from being built upon, to create buffer zones between conflicting land uses (e.g. between residential and industrial areas) or to reserve inner city space for future uses. In **Beijing** (China), specific urban agricultural types and activities are promoted in the different peri-urban zones of the city. In **Ho Chi Minh City** and to a lesser extent in **Hanoi** (Vietnam), areas in and on the periphery of the city are also set aside for aquaculture.

Such urban agricultural zones are more sustainable if located in areas that are not well suited for construction or where construction is not desirable, such as flood plains, under power lines, in parks or in nature conservation areas. The City Master Plan of **Setif** (Algeria), includes the creation of a green strip west of the city on the flood-prone fields of the Boussellam wadi valley (Boudjenouia et al., 2006).

Peri-urban greenbelts surrounding cities tend to come under pressure to be built upon. After remaining essentially unchanged for almost 30 years due to the policies of military regimes, in recent years **Seoul's** (Taiwan) green belt came under strong pressure as a result of major and rapid economic development and city expansion. A proposal has been made to release 112.5 km2 of Seoul's green belt for city development (Bengston and Youn, 2006).

The "green fingers" model of urban expansion (i.e. along certain axes with green zones in between), as has been applied in several European cities, such as **Copenhagen** and the "city network" model (a metropolis consisting of interlinked smaller urban centres interlocking green multi-functional open spaces) as can be found in the "**Randstad**" (the Netherlands) however seem to be more sustainable than the "green belt" model.

Zoning in itself is also not sufficient to maintain the avilable green open spaces: maintenance of these zones strongly depends on the political will of the local authorities and the practical, technical and financial support provided to the urban farmers, as well as the development of sustainable and multi-functional agriculture farming systems located in these green belts. An interesting comparison can be made between the experience of **Hubli-Dharwad** (India), where the Green Zone is being pushed outwards since the municipality needs the income from sales of public land for construction, and the experience in **Beijing** (China), where the green belt close to the inner city is strictly protected in recognition of the importance of recreation and urban greening as well as the production of fresh food (see also: Proceedings of the RUAF-UN Habitat E-conference "Optimising Agricultural Land Use in the City Area", 2003. http://www.ruaf.org).

Promotion of multifunctional land use

Under certain conditions urban farming can be combined with other compatible land uses. Farmers may provide recreational services to urban citizens, receive youth groups to provide ecological education, act as co-managers of parks, and their land may also be used as water storage areas, nature reserves, fire break zones, flood zones, etc. Aquaculture in urban or peri-urban lakes or ponds may be combined with other (water and fish related) recreational activities like angling, boating, a fish restaurant, etcetera, which proved successful model in **Bangkok** (Thailand). Agriculture and aquaculture may be linked to wastewater treatment and reuse e.g. in constructed wetlands like is practiced in **Calcutta** (India) at a massive scale and what could become an integral part of management of (peri-)urban green open spaces. By doing so the management costs of such areas may be reduced, and protection against unofficial uses and informal re-zoning may be enhanced.

The Municipality of **Beijing** (China) is promoting the development of peri-urban agro-tourism both in the form of larger agro-recreational parks as well as family-based agro-tourism: farmers diversifying their activities by offering services to urban tourists (food, accommodation, sales of fresh and processed products, functioning as tourist guide, horse riding, etc.). The local government made agro-tourism part of municipal and district level planning; established an agro-tourism association and information dissemination service; assists interested farmers with business planning, tax exemptions and funding of infrastructure development, and provides subsidised water and electricity (Fang et al., 2005).

Some municipalities (e.g. **Pretoria**, South Africa; **Vancouver**, Canada) entered into a partnership with producers to manage municipal open spaces that combine community gardening with other functions (park or recreational area). In 2006, the first garden park (Parque Huerta) was officially installed in **Rosario** (Argentina). The park, located on the fringe of the city, will be used for production, education as

well as recreation. The initiative is supported by different municipal departments and other urban actors.

Relocation of urban farmers

Farmers who are located in areas where their activities may cause serious health and/or environmental impacts may have to be relocated. In the case of planned conversion of agricultural areas for other land uses, the urban farmers could be supplied with alternative land areas and be assisted with basic infrastructure development (water, fence) in their new locations. In **Jakarta** (Indonesia), 275 dairy cattle farmers with over 5,500 cows have been relocated from the inner city area (where intensive cattle breeding caused disease and waste problems) to a peri-urban area. In **Amsterdam** (the Netherlands), a community garden was relocated after the municipality decided to start constructing houses in the area (Wilbers, 2005). During the period 1986-1989 Montreal relocated 12 gardens (Bhatt & Kongshaug, 2005).

Integration in social housing projects

Cities like **Vancouver** (Canada) **Colombo** (Sri Lanka), **Kampala** (Uganda), **Rosario** (Argentina) and **Dar es Salaam** (Tanzania) are experimenting with the inclusion of space for home and/or community gardening in new public housing projects and slum-upgrading schemes. Some cities also promote the recycling of grey household wastewater for use in home gardens and educate farmers regarding prevention of health risks.

MEASURES TO ENHANCE THE PRODUCTIVITY AND ECONOMIC VIABILITY OF URBAN AGRICULTURE

Urban agriculture tends to be highly dynamic and innovative, in part because of its proximity to the urban consumers and the special urban conditions the farmers operate in, though its development is often constrained by urban farmers' limited access to training, extension services, credit, etc. Agricultural research and extension services and other support organisations have - until recently - given relatively little attention to agriculture in the (peri)urban environment, or if doing so, only to the larger-scale commercial agro-enterprises.

Hence there is ample scope for enhancing productivity and profitability in urban agriculture. Municipalities and other urban actors can play an important role, especially by stimulating and coordinating production, developing joint programmes with relevant sector organisations, co-funding, providing licenses, supplying compost and basic infrastructure, etc. as will be shown below.

> *"Municipalities should give more attention to the link between food supply and local agricultural production. Several municipal initiatives can be used to provide incentives for programmes such as farmers' markets, home delivery of fresh products, training courses for family farming, assignment of vacant lots to food production, and the use of differential taxes for land under production." Project "Fome Zero" (Zero Hunger), a proposal for a food security policy for Brazil. Administration of Luiz Inácio Lula da Silva.*

Farmer training

Governmental organisations and the private sector should be stimulated to provide training, technical advice and extension services to urban farmers, with a strong emphasis on ecological farming practices, proper management of health risks, farm development (e.g. intensification and diversification), enterprise management and marketing. Cost-sharing systems (among farmers, municipality, governmental organisations, private enterprises) will be needed to ensure sustainability of the extension system. Education and extension institutions should be encouraged to include urban agriculture in their curricula and programmes.

Policy seminar in Brasil (photo Ivana Cristina Lovo).

Recently initiated urban agriculture programmes include training and education activities. The Urban Agriculture Programme of **Rosario** (Argentina) provides technical assistance and training to producer groups. In **Governador Valadares** (Brazil), one of the strategic activities is to: "Carry out technical training and citizen education courses for the families and groups involved in the municipal urban agriculture programme" (please see "Required readings, Module 12", for more information on these 2 programmes).

The **Cape Town** (South Africa) policy on urban agriculture calls upon the services of the research, training and support organisations in and around the city to provide the urban farmers with training on business administration, technical skills, marketing, etc. The Botswana policy paper assigns a critical role to farmer education through the production of books, brochures, posters, and community-level demonstration projects by governmental organisations, municipal departments, Non Governmental Organisations (NGOs) and Community Based Organisations (CBOs) and advocates for the integration of urban agriculture into the formal training and education system (e.g. agricultural colleges, technical schools). In **Chicago** (USA) both the municipality and NGOs like Heifer and Growing Power provide capacity building and training activities for community gardeners. They jointly seek to find political support in initiatives like Chicago Organic and The Chicago Food Policy Council.

Strengthening farmers' organisations

Most urban farmers are poorly organised and usually in an informal way. They therefore lack sufficient channels and power to voice their needs. This limits the representation of their interests in urban policy making and planning at the various levels and hampers their participation in development programmes. Well-functioning farmers' organisations can negotiate access to land, adequate tenure arrangements and access to credit. Such organisations may also take up roles in farmer training and extension, infrastructure development, processing and marketing, and control / certification of the quality of the products marketed. In **Bangkok** (Thailand) for example, associations of aquaculture farmers were instrumental in negotiating fair prices for producers or negotiating contracts directly with wholesalers and retailers.

More efforts are needed to identify existing farmers' organisations and informal networks of (various types of) urban farmers, to analyse their problems and needs, and find effective ways to help them develop further. Municipalities may stimulate their departments as well as universities, NGOs and CBOs present in the city to actively support the capacity development of farmers' organisations and to strengthen the linkages between farmers' organisations and private enterprises, consumer organisations and support organisations.

Small urban producers participating in the PROVE programme of **Brasilia FD** (Brazil) were stimulated to establish a farmers' association and their capacities were enhanced to gradually replace the PROVE government officers in their supporting role (Homem de Carvalho, 2005). In **Rosario** (Argentina), development of the Network of Urban Producers (Red de huerteras y huerteros) has been stimulated by the municipal Urban Agriculture Programme for the same reason. According to Lattuca et al. (2005), the municipality also assisted in the establishment of agreements with other strategic governmental and private actors and other strategic social actors. The municipality of **Montevideo** is working together with the Uruguayan Organic Producers Association (APODU) to address commercialisation issues (e.g. establishment of the market in Montevideo) and funding (Blum et al., 2005).

In **Hyderabad** (India), the Green Fodder Grass Farmers Association markets about 250 tons of fodder a day making use of a piece of land temporarily rented from a mosque. At present access to a public area of land is being negotiated with the Hyderabad government for more permanent use. The Association is also pressing for official recognition of its members' trade, in cooperation with inner city dairy producers and milk consumers.

Development of appropriate technologies

Urban agriculture is performed under specific conditions that require technologies different to those used in the rural context. Such specific conditions include limited availability of space and the high price of urban land, proximity to large numbers of people (and thus a need for safe production methods), use of urban resources (organic waste and wastewater), and possibilities for direct producer-consumer contacts. Most available agricultural technologies have to be adapted for use under these conditions whilst new technologies have to be developed to respond to specific urban needs (e.g. non-soil production technologies for use on roofs and in cellars; development of safe and economic practices for reuse of wastewater).

Municipalities and other local stakeholders could provide funding and expertise to boost participatory problem analysis, develop research proposals and voice the research and technology development needs of their urban farmers to research institutes and national governments. Also, better coordination between research institutes, agricultural extension organisations, NGOs and groups of urban farmers could be promoted.

Special attention has to be given to the introduction of ecological farming practices (like integrated pest and disease management, ecological soil fertility management,

Action Planning by the team in Accra (photo: Theophilus Otchere-Larbi).

soil and water conservation, etc.), space intensive and water saving technologies, health risk reducing practices and the creation of farmer study clubs and field schools that actively engage in the technology development and assessment process.

The Botswana policy paper urges research and extension institutions to develop and disseminate technologies with and to small-scale urban farmers. The following technologies are mentioned: (a) adaptable cultivars (e.g. cabbage, tomato, union, etc.), (b) water saving techniques (e.g. drip irrigation system or micro-irrigation system), and (c) appropriate production practices (e.g. hydroponics, concrete benches, protected agriculture). In **Havana** (Cuba), ample research is being conducted on adequate urban production methods e.g. development of fruit trees suitable for urban areas (non-damaging root systems).

A considerable number of (local) governmental institutes pay attention to agro-ecological practices in their urban agriculture programmes, including:

- In **Montreal** (Canada), the municipal community gardening programme has a clear focus on ecological gardening methods, which is exemplified by the fact that only environmentally friendly methods to control bugs, plant diseases and weed infestation are allowed in the city's community garden parks (Reid, 2005).
- The national urban agriculture programme in Cuba prohibits the use of agrochemicals in the city and has two sub-programmes specifically geared to the development and stimulation of organic composting and agro-ecological integration to ensure that newly developed techniques do not harm the environment.
- One of the objectives of the Municipal Programme for the Development of Organic Agriculture in **Rosario** (Argentina), is to train the participating beneficiaries in the production and commercialisation of organic vegetables and associated enterprises. The programme further stimulates the establishment of micro-enterprises for the production of organic bio-fertilisers and compost that can supply the urban farmers.
- The city of **Governador Valadares** (Brazil), stimulates the use of ecological techniques in urban agriculture production, processing and marketing by organising training courses and providing technical assistance to urban farmers' groups.

Enhancing access to water, inputs and basic infrastructure
Municipalities can play an important role in enhancing access of urban farmers to water and production inputs. Access to a year-round supply of low-cost water is of crucial importance as well as access to (composted or fresh) organic materials and other sources of nutrients (like wastewater).

The city of **Bulawayo** (Zimbabwe), provides treated wastewater to poor urban farmers in community gardens, while the city of **Tacna** (Peru) agreed to provide urban farmers its treated wastewater in return for their assistance in maintaining public green areas. The cities of **Gaza** (Palestinian Authority) and **Tafila** (Jordan) promote the collection and reuse of grey household water in home and community gardens.

Mexico City (Mexico) promotes systems for rainwater collection and storage, construction of wells and the establishment of localised water-efficient irrigation systems (e.g. drip irrigation) in urban agriculture to stimulate production and to reduce the demand for potable water. The municipality of **Cape Town** (South Africa) supplies community gardener groups with a basic infrastructure (a fence, a tool shed, a tank and hoses for irrigation), composted organic wastes and up to a certain amount of free water daily. In addition, it provides community groups that wish to start gardening activities with a "start-up kit for survivalist gardeners", consisting of a pickaxe, spade, rake, watering can, seeds and compost. The start-up kit is further supplemented by skills training and extension services.

Some cities, such as **Havana** in Cuba, support the establishment of decentralised low-cost facilities for compost production and installation of composting toilets. Substantial progress has been made there in recycling urban organic waste. **Havana** also facilitates the supply of quality seeds, natural fertilisers and bio-pesticides in small quantities to urban farmers through a network of local stores. The municipality of **Marilao**, located on the fringe of Manila, the Philippines, is establishing a composting facility, while the NGO community is addressing the necessary change in behaviour of the urban households in the municipality (Duran et al, 2006).

Enhancing access of urban farmers to credit and finance
Improved access of urban farmers to credit and finance (with an emphasis on women-producers and the resource-poor farmers) is very much needed. Municipalities may stimulate existing credit institutions to establish special credit schemes for urban farmers (e.g. by creating a guarantee fund) or to allow their participation in existing credit schemes for the informal sector (this often also requires revision of the loan conditions).

The Botswana policy paper recommends the Ministry of Agriculture to encourage existing savings and credit cooperatives to provide credit also to urban farmers for their farming businesses.

The inclusion of urban agriculture in the municipal budget is also an essential component in the promotion of urban agriculture activities. In many cities, such as those noted above, the city council allocates resources to support its policy and programme on urban agriculture (infrastructure development, training, marketing support, start-up kits, etc).

> *"Local governments should show a clear commitment to the development of urban agriculture, mobilising existing local resources, integrating urban agriculture in the municipal structure, expanding it nationwide, and allotting funds from the municipal budgets for carrying out urban agriculture activities." Quito Declaration, signed by 40 cities. Quito, Ecuador. April 2000.*

Facilitating direct marketing by urban farmers
Due to the low status of urban agriculture and the usual exclusive focus on food imported from rural areas and the exterior, the creation of an infrastructure for direct local marketing of fresh urban-produced food and local small processing of locally produced food has received little attention in most cities. However, some municipalities do facilitate the marketing of surpluses by poor urban farmers by providing them access to existing city markets, assisting them in the creation of farmers' markets (infrastructure development, licenses, control of product quality), authorising food box schemes and/or supporting the establishment of "green labels" for ecologically grown and safe urban food. An example is **Brasilia FD** (Brasil), which is furthering the integration of small food production with local food processing and marketing (Homem de Carvalho, 2001). The **Budapest** municipality (Hungary) assisted Biokultura, the local organisation of urban and peri-urban farmers create a weekly organic farmers' market. Biokultura has its own organic certifying institute.

Many cities in the USA and Canada provide space for farmers' markets to organised local farmers. Examples include the city of **Vancouver** (Canada) and the work of the Rainbow Coalition in **Milwaukee** and **Chicago**, which organises the cooperative sale of organic farm produce

through farmers' markets and food box schemes.

The municipality of **Governador Valadares** (Brazil) has prioritised the marketing of urban agricultural products in different ways: (a) by providing incentives for the formation of cooperatives for the production and commercialisation of products, (b) by creating sales and distribution centres as well as farmers' markets in the city and c) by buying agricultural products from the urban farmers' groups to supply to schools, community kitchens, hospitals and other service organisations.

Supporting micro-enterprise development

Some municipalities promote the development of small-scale enterprises, such as suppliers of ecological farm inputs (compost, earthworms, seeds and plant materials, bio-pesticides) and processing enterprises (food preservation, packaging, street vending, transport) by:

- providing start-up licenses and subsidies or tax reductions to micro and small entrepreneurs,
- providing technical and management assistance to micro- and small enterprises,
- providing subsidies and technical assistance for local infrastructure and equipment for small-scale food preservation and storage facilities.

In Ghana, the municipality of **Accra-Tema** cooperated with the Ministry of Food and Agriculture in the establishment of a milk collection system in order to encourage dairy farming in the peri-urban areas of the municipality (NRI, 1995). In **Brasilia FD** (Brazil), the PROVE programme supports the development of small agro-processing and/or packaging units managed by urban farmers' groups and assists them in setting up quality labels and other marketing strategies. The PROVE products began to be sold in supermarkets as a result of an agreement between the local government, supermarkets and producers. Based on this example, agro-industries were also established in **Rosario**, the products of which are sold at weekly urban markets, in municipal offices, etc.

The small scale of production and rapid turnover of capital of small urban producers often impedes them from buying even small amounts of good-quality inputs at affordable prices. Therefore, some municipal programmes develop mechanisms for collective purchasing and sales in small units to urban farmers. In **Havana** (Cuba), farmers' stores (Tiendas del Agricultor) have been installed in the various neighbourhoods. In these stores, urban farmers can buy equipment, seeds, natural fertilisers, and bio-formulas in small quantities and at low prices. In addition, these stores offer technical assistance.

MEASURES TO PROMOTE GENDER EQUITY AND SOCIAL INCLUSION

Urban agriculture projects could be designed in such a way as to specifically involve disadvantaged groups such as children, youth, disabled people, women, recent immigrants without jobs, or elderly people, and with the aim to integrate them into socio-economic city-life. (see e.g. Garnett 2000, Gonzalez Novo and Murphy, 2000). Many of these groups are especially at the risk of food insecurity, given their often lesser access to rural and urban land, as well as to technical assistance and credit resources. Many examples show us urban agriculture providing an excluded group of urbanites with a source of income and economic survival, and new connections to an unfamiliar urban society; or in other words, assimilation into the larger urban economic and social network (Bailkey, Wilbers and van Veenhuizen, 2007).

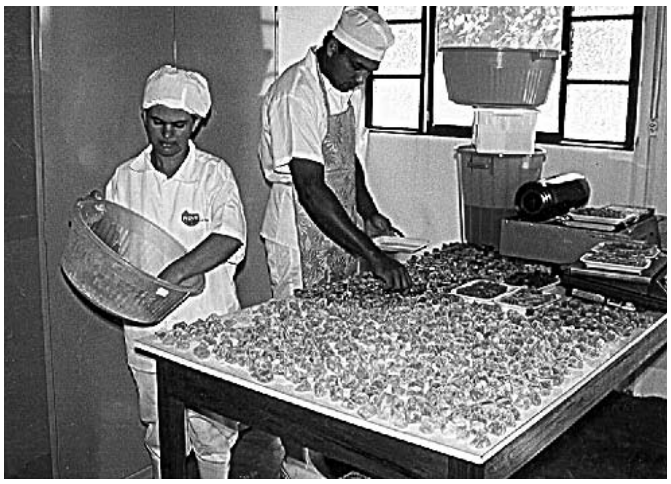
Gender affirmative actions

The percentage of poor female-led households is generally increasing in many developing countries. In many cities, women already constitute the majority of urban farmers. However they often experience limited access to education, land ownership and access to financial resources. In **Fortaleza** (Brazil), Banco Palmas created the "Incubadora Femenina", a food security project seeking to involve women at risk. The project includes providing information, visits to farmer's markets and an "urban agriculture laboratory" where women learn farming activities. They are thus prepared to start their own family farming operations, cultivating fresh vegetables and medicinal herbs. The municipality of **Oña** (Ecuador) promoted the use of municipal and private land for farming as part of the municipal Economic Development Plan, prioritizing women and senior citizens. The micro-credit PROQUITO Program, in the municipality of Metropolitan Quito (Ecuador), offers preferential access to credit for urban agriculture to women who are heads of households and to people under 30 years of age, two groups that have the highest unemployment rates in the city (IPES/UMP-LAC, 2002).

School and children's gardens

Extensive and mounting evidence shows that school-based garden programs have significant health effects on young people. In these non-traditional learning labs, youth become familiar with good and healthy food, especially the fruits and vegetables critical to reducing obesity and chronic diseases. It is precisely these foods that are missing from our children's

usual diets. School garden programs teach a skill and a lifetime hobby that provides exercise, mental stimulation, and social interactions. Children receive practical entrees to biological and environmental sciences, math, geography, and social studies. Additionally, reports show that these advantages accrue to students that have trouble succeeding in school as well as those who excel. Amongst many other cities, the cities of **Antananarivo** (Madagascar), **Rosario** (Argentina), **Bulawayo** (Zimbabwe) and **Gampaha** (Sri Lanka) are promoting schoolgarden programmes.



Processing fruit in PROVE, Brazil (photo Joao Luis PROVE).

In six other cities (**Addis Ababa,** Ethiopia; **Asmara**, Eritrea; **Freetown**, Sierra Leone; **Kabul**, Afghanistan; **Kigali**, Rwanda and **Nablus**, Palestine), children's gardens are set up to significantly improve the nutritional and social status of orphans and vulnerable children by educating them in nutrition, health/hygiene, urban agriculture and life skills. Youth (age 15-24) is selected to be trained as "master gardeners" in urban agriculture, nutrition and health. A model-urban garden is set up for this purpose. These youth will on their turn train other youth and children and support them in setting up their gardens in their city (http://www.glocalforum.org/projects/?id=199&id_p=90&lng=en).

Supporting youth entrepreneurs through urban agriculture

For a growing number of urban youth, in the face of shrinking formal employment, market-oriented urban agriculture and related enterprises provide a relatively accessible entry into the urban job market. They can earn an income, save on food, learn another trade and perhaps set up a small business. In **Brooklyn** (USA), youth aged 14-19 in the Red Hook neighborhood is supported to become active participants in the local economy and community through projects that reclaim vacant urban land for organic agriculture and marketing. The group has established an urban farm on 2 acres of a rarely- used city baseball field. The youth initiated and now manage a farmers' market that caters to the growing, economically diverse population in Red Hook. In **Portland** (USA), a youth employment program, Food Works engages 14-21 year olds in all aspects of planning and running an entrepreneurial farm business. Working side by side with gardens' staff, community residents, local farmers, business owners and non-profit leaders, Food Works' Crew Members learn business, leadership, organic agriculture and other work skills. Crew Members also receive school credit for their work and are supported to transition into other employment opportunities and post secondary education (http://www.janusyouth.org/what-we-do/urban-agriculture-services.php).

HIV-AIDS mitigation through urban agriculture

Families affected by HIV/Aids tend to have higher expenses due to costs related to treatment of the infections. Meanwhile, family income tends to go down due to loss of strength and status of the HIV/Aids-affected family members leading to further socioeconomic deterioration. Urban agriculture projects can make important contributions to mitigate the impacts of HIV and Aids at the individual, family and community level. Its benefits include improved nutrition of HIV/Aids affected families, savings on food expenditures, added income from the sale of surpluses, and community mobilization to respond to HIV and Aids. Although, adequate nutrition cannot cure HIV-infection, it can substantially enhance the life expectancy and quality of life of HIV-infected persons. It also improves the response to treatment.
In **Bulawayo** (Zimbabwe) 12 allotment gardens were recently established by the city council in selected areas in the high-density and low-income areas of the city. The beneficiaries of the garden allotments are HIV-affected households, the elderly, widows and the destitute. In order to avoid the stigmatisation associated with HIV, each garden draws from a mixed group of beneficiaries. The garden allotments, which largely produce vegetables, have contributed to food security and local community development. The HIV-affected households feel less discriminated against as they work with other community members in their gardens. The city of **Gweru** (Zimbabwe) has started a recycling and organic farming project as a way of rehabilitating and integrating former commercial sex workers (including those from HIV/Aids-affected families) into society. Some agricultural plots close to the dump were allocated to the group of over twenty where they practice

agriculture using organic wastes salvaged from including leafy vegetables, tomatoes, beans and maize. The surplus crops are sold and income shared amongst the group (Mubvami and Manyati, 2007).

Supporting migrants

In **Cologne** (Germany) intercultural gardens are promoted to allow immigrants to rent plots of land and plant gardens. They can work side-by- side with Germans – pursuing their gardening hobby, carving out a niche for themselves in a foreign country and improving their German. Many of the foreign gardeners cultivate plants and herbs from their home countries, which they otherwise can't find in Germany. An intercultural garden club in Cologne was created in 2005 and has about 30 members, eight of them very active. The gardeners are originally from Turkey, Iran, the Democratic Republic of Congo, Cambodia, Japan, Poland and Germany (for more information, please look at: http://www.stiftung-interkultur.de/eng/tasapr.htm). In **Beijing** (China) half a million peri-urban migrants are producing a large share of the city's fruits and vegetables consumption, however till recently without any acknowledgement or support. The Beijing Agricultural Bureau is now supporting them to form cooperatives and provides technical assistance in ecological production techniques and marketing.

Pro-poor urban agriculture policies

To facilitate participation in urban agriculture by low-income producers and the most vulnerable groups, selection criteria should favour social inclusion. Apart from specifically targeting women, children, youth, migrants, HIV-AIDS infected and the urban poor (see examples given above), cities have also experimented other innovative measures that enhance the urban poor's access to land and water resources, training and information and financing. For example, instead of requiring actual collateral or reserves for getting a loan, other types of joint guarantee, which may be more accessible to low-income groups, exist to cover non-payment risks, such as group credits with joint guarantees. In **Brasilia DF** (Brazil), the PROVE Program created a state fund with a non-monetary guarantee in the form of "Mobile Agro-industries", metal constructions that can be transported on a truck. Since these constructions are both mobile and durable, the same one mobile agro-industry could be used as collateral for getting loans for a large number of producers. Another strategy was applied in Argentina, where the PSA Program has implemented a line of credit for family farming, allowing producers to receive amounts of up to $200 pesos, with payback options involving either products or working in a public welfare institution (school kitchens, hospitals) (IPES/UMP-LAC, 2002)

MEASURES TO REDUCE THE HEALTH AND ENVIRONMENTAL RISKS ASSOCIATED WITH URBAN AGRICULTURE

Rather than restricting urban agriculture out of fear of – often unspecified – health and environmental risks, which has often turned out to be an ineffective strategy, cities are choosing more and more to design a series of accompanying measures to reduce these risks.

Improved coordination between health, agriculture and environmental departments

The most important measure is to create mechanisms of close cooperation between agriculture, health and environment/ waste management departments to assess actual health and environmental risks associated with urban agriculture and to design effective preventive/mitigating strategies for which the participation of all these sectors is required. In **Kampala** (Uganda), for example, health and agricultural and town planning specialists closely cooperated in the development of a series of ordinances on urban agriculture livestock and fisheries. In **Phnom Penh** (Cambodia) steps are being taken to improve the coordination between municipal departments, universities and private organisations for controlling and monitoring the microbiological and chemical quality of wastewater-fed fish and plants in order to reduce a number of health problems (especially skin infections) related to wastewater-fed aquaculture (Papussa Policy Briefs No 4, 2006). In **Kumasi** (Ghana) small kits have been made available to various local organisations to periodically test the quality of the irrigation water.

Health considerations when setting aside zones for urban agriculture

Many cities identify zones where certain types of urban agriculture are allowed (often also defining certain management conditions for each of these urban agriculture types) and where other types are excluded (due to expected negative effects in the given local circumstances), in order to reduce health and environmental risks. When preparing such zoning and related regulations, factors like population density, the ecological sensitivity of the area concerned, proximity to polluting industries and proximity to sources of drinking water should be taken into account as well as the potential risks related to certain types of urban agriculture. Furthermore, the available means to enforce

Policy making and action planning (photo: IPES).

the zonification and related regulations should be taken into account.

A city may want to avoid having free-roaming cattle and major concentrations of stall-fed dairy cattle or pigs in central districts (due to traffic, bad smells, flies and waste management problems). For example, the city of **Cape Town** (South Africa) is planning to relocate larger-scale dairy farmers from the inner city to public land in the peri-urban area. Also, it may be prudent to keep intensive horticulture and poultry keeping out of areas that are sources of drinking water (due to the risk of water contamination from use of chemical fertilisers or pesticides) or to prevent mono-cropping in river stream beds (due to erosion problems or siltation of dams). Proper location of arable crops in relation to sources of contamination is also important to reduce the effects of air pollution. Leafy vegetables, for example, should not be kept within 50-75 metres of a main road. Production of food crops close to industries that emit certain toxic chemicals should also be discouraged.

Farmer education on the management of health and environmental risks

Health risks associated with urban farming can be reduced substantially if farmers are made well aware of these risks and know how to prevent them. Examples of preventive measures that can be implemented by farmers themselves are the following:

- Promotion of ecological farming methods to reduce risks related to intensive use of agrochemicals.
- Health risks related to raising animals in close proximity to homes and workplaces can be diminished through adequate animal housing on the site, adoption of hygienic measures in relation to animal feed, adequate animal waste management, regular cleaning and disinfection of the stables, etc.
- Health risks related to the use of wastewater can be reduced by using adequate irrigation practices and by choosing the right crops. Untreated wastewater should preferably not be used for food crops (especially not fresh leafy vegetables), but may be used for growing trees or shrubs, crops for industrial use and other non-edible plants (ornamentals, flowers). In **Xochimilco** (Mexico), urban producers shifted from vegetable growing to a lucrative floriculture when untreated canal water became unfit for growing food (Canabal, 1997). In **Hyderabad** (India), farmers shifted from production of paddy (rice) to fodder grass when river water, which is used for irrigation, gradually became more polluted (Buechler et al., 2006)

- Food fish farmers facing increasing pollution and food safety problems can be stimulated to switch to ornamental fish production, as was done in **Bangkok** (Thailand) and **Ho Chi Minh City** (Vietnam). Vegetable producers in **Ho Chi Minh City** have begun cultivating ornamental plants for the growing urban middle class. In this way, the already available skills and expertise in aquatic production systems are optimally used, whilst a market and export industry that brings in cash is strengthened. **Ho Chi Min City** applies a combination of crop restrictions and tax incentives for certain production systems in order to support the needed change from less safe to more safe production systems based on wastewater use.
- In areas contaminated with heavy metals (due to heavy traffic close by or industry), crops with a high uptake of heavy metals and nitrates like celery, parsley, leek, lettuce, spinach, carrots, beets and radishes should be discouraged, in favour of crops that present less risk like gourds, onions, garlic and fruit trees and shrubs. In severely polluted areas, farmers should consider growing non-edible plants rather than food crops, or production should be limited to containers, raised beds or other systems using special growing media.

Education of food vendors and consumers

Crops can become contaminated not only during production but also during the marketing and food preparation stages. Access to clean water and sanitation facilities in markets should be provided. A food-hygiene course should also be provided to small food processors and vendors (e.g. licenses could be provided/renewed only after an applicant followed such a course with success). Consumers need to be educated regarding washing or scraping of crops, heating of milk and meat products and securing hygienic conditions during food handling. They also need education regarding the importance of fresh nutritious foods and medicinal herbs and their preparation. A FAO project on making street foods safer, among other places in **Dakar** (Senegal), is training food vendors, food inspectors and consumers in food hygiene issues (http://www.fao.org/News/2001/010803-e.htm). In **Accra** (Ghana), a multi-partner project resulted in the training of more than 3,000 street food vendors on improved hygiene practices as well as increased consumer awareness (http://www.nri.org/streetfoods/project2-moreinfo.pdf).

Prevention of industrial pollution of soils and water by industry

Contamination of soils, rivers and streams by industry is a growing obstacle to safe urban food production. Separation of city waste (residential and office areas) and industrial waste streams and treatment of industrial wastes at the source should be promoted. In areas where contamination might occur (e.g. downwind and downstream of industrial areas) periodic testing of soils and water quality in agricultural plots might be needed.

Increasing pollution and contamination of cities' domestic wastewater with industrial wastewater effluents is a major constraint to the continued viability of irrigated urban agriculture as well as to aquaculture. In many South-East Asian cities, the continuity of the existing potential for growing aquatic vegetables and fish using urban wastewater will depend on the city planners' ability to coordinate and develop strategies for effective separation of toxic industrial waste from domestic sewage. There are already encouraging examples in **Hanoi** and **Ho Chi Minh City** (Vietnam) of relocation of urban industries to industrial parks which allow for more effective treatment and monitoring of effluents. In the medium term, enforcing existing pollution control legislation to control contaminants at their source and monitoring and regulation of industrial wastewater discharge into public water sources can be effective in reducing health risks. When serious soil pollution is detected, farmers could be trained to rehabilitate the polluted soils with bio-remedial methods and/or farmers could be relocated.

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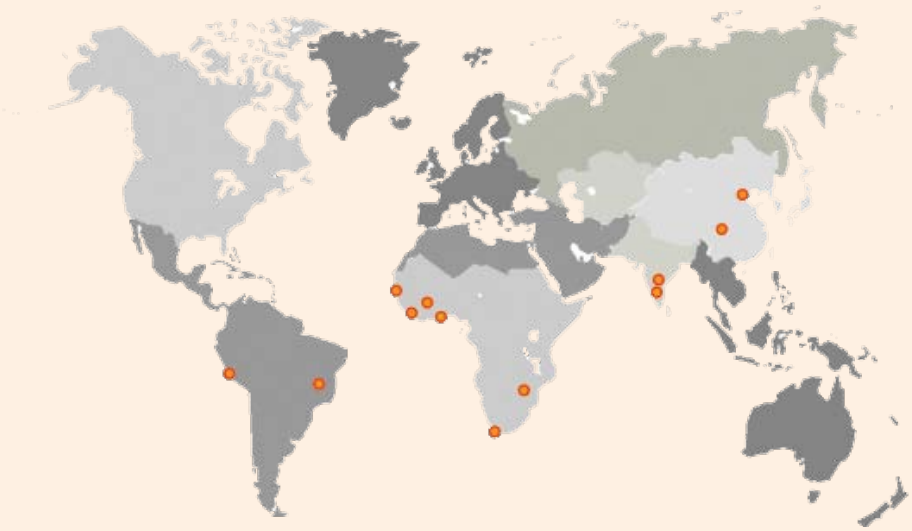
NRI Street Foods Project http://www.nri.org/streetfoods/project2-moreinfo.pdf

Acronyms and Abbreviations

AWGUPA	Accra Working Group on Urban and Peri-urban Agriculture
MoFA AMA	Ministry of Food and Agriculture and the Accra Metropolitan Assembly
CBO	Community Based Organisation
CFF	Cities Farming for the Future Programme
ETC-UA	ETC-Urban Agriculture
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
IAGU	Institut Africain de Gestion Urbaine (African Urban Management Institute, Senegal)
IPES	Instituto Peruano de Promoción del Desarrollo Sostenible (Peruvian Institute for the promotion of Sustainable Development)
IWMI	International Water Management Institute (Offices in Ghana and India)
LAC	Latin America and the Caribbean region
MDG	Millennium Development Goal
MDP	Municipal Development Partnership for Eastern and Southern Africa (Zimbabwe)
MENA	Middle East and North African
MPAP	Multi-stakeholder Policy Formulation and Action Planning
MSPs	Multi-Stakeholder Processes
NGO	Non-Governmental Organisation
PRA	Participatory Rapid Appraisal
PTD	Participatory Technology Development
RUAF	International Network of Resource Centres on Urban Agriculture and Food Security
SGUA	Support Group on Urban Agriculture
SIUPA	Strategic Initiative on Urban and Peri-urban Agriculture (now named Urban Harvest)
ToT	Training of Trainers
UA	Urban Agriculture
UPA	Urban and Periurban Agriculture
UMP	Urban Management Programme (UN-HABITAT) (Ecuador, Kenya)
UN-HABITAT	United Nations Human Settlements Programme
WHO	World Health Organization

RUAF Foundation

RESOURCE CENTRES ON URBAN AGRICULTURE & FOOD SECURITY



THE RUAF PARTNERS

Latin America
IPES Promoción del Desarrollo Sostenible, Lima Peru
email: au@ipes.org.pe www.ipes.org

French Speaking West Africa
IAGU Institut Africain de Gestion Urbaine, Dakar, Senegal
email: moussa@iagu.org www.iagu.org

English Speaking West Africa
IWMI-Ghana, International Water Management Institute
email: o.cofie@cgiar.org www.iwmi.cgiar.org/africa/west_africa

East and Southern Africa
MDP Municipal Development Partnership
email: tmubvami@mdpafrica.org.zw www.mdpafrica.org.zw

South and South East Asia
IWMI-India, International Water Management Institute
email: r.simmons@cgiar.org www.iwmi.cgiar.org/southasia/index.asp

North Africa and Middle East
AUB-ESDU, American University of Beirut, Environmental and Sustainable Development Unit email: zm13@aub.edu.lb
Magazine in Arabic: www.ecosystems.org/urbanagriculture/index.htm

China
IGSNRR Institute of Geographical Sciences and Natural Resource Research of the Chinese Academy of Sciences; email: caijm@igsnrr.ac.cn www.cnruaf.com

Coordination and Strategy Development
ETC-UA ETC-Urban Agriculture
email: ruaf@etcnl.nl www.ruaf.org

Since 1999, the International network of Resource Centres on Urban Agriculture and Food Security (RUAF) supports awareness raising, documentation and exchange of information on urban agriculture. In March 2005 the RUAF partners jointly established the RUAF Foundation as their joint administrative body and liaison office. The central aim of the RUAF Foundation is to contribute to urban poverty reduction, urban food security, improved urban environmental management, empowerment of urban farmers and participatory city governance by enhancing policy awareness on benefits and risks of urban agriculture, capacity development, facilitating local policy formulation and action planning on urban agriculture, and promoting networking and exchange of experiences.

CITIES FARMING FOR THE FUTURE PROGRAMME

The Cities Farming for the Future programme (2005-2010) is the follow-up to the first phase (1999-2004) of the RUAF core programme. CFF is funded by DGIS (the Netherlands) and IDRC (Canada) and is implemented by the seven regional RUAF partners in co-ordination with ETC-UA (Leusden, the Netherlands) in 20 pilot cities and 48 dissemination cities. In the pilot cities the RUAF partners are implementing the following main strategies: Local Capacity Development, Facilitation of MPAP (Multi Stakeholder Policy Development and Action Planning), Knowledge Management and networking, Monitoring and Gender mainstreaming.

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IDRC CRDI

Ontwikkelings samenwerking