

The development of Urban Agriculture; some lessons learnt

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By Ir. Henk de Zeeuw

**Coordinator Resource Centres on Urban Agriculture and Food Security
(RUAF)
ETC Foundation
Leusden, the Netherlands**

h.dezeeuw@etcnl.nl
www.ruaf.org
www.etc-international.org

Honourable Vice-Minister, Mayors, other government officials, researchers and urban planners, ladies and gentlemen.

Urban Agriculture is receiving growing attention from international organisations and national and local governments all over the world and since its significance for sustainable urban development are increasingly recognised.

Before explaining this in more detail, I like to clarify what we mean by urban agriculture

Urban Agriculture

Urban agriculture can be defined as:

Agricultural production (crops and livestock) in urban and peri-urban areas for food and other uses, the related transport, processing and marketing of the agricultural produce and non-agricultural services provided by the urban farmers (water storage, agro-tourism, urban greening and landscape management, a/o)

One striking feature of urban agriculture, which distinguishes it from rural agriculture, is that it is ***integrated into the urban economic and ecological system.***

It is not its urban location which distinguishes urban from rural agriculture, but the fact that it is embedded in and ***interacting with the urban system.*** Such linkages include the use of urban residents as labourers, use of typical urban resources (like organic waste as compost and urban water for irrigation), direct links with urban consumers, direct impacts on urban ecology (positive and negative), being part of the urban food system, competing for land with other urban functions, being influenced by urban policies and plans, etc. It is often thought that urban agriculture is a relict of rural habits that has come with the migrants to the cities and that will dwindle over time but that is not correct. It is an urban phenomenon that tends to grow when cities grow (although its locations and characteristics change sharply).

Intra-urban agriculture takes place within the city boundary. Most cities and towns have vacant and under-utilised land areas that are or can be used for urban agriculture, including areas that are not suited for building (along streams, within utility rights of way, close to airports, areas prone to earthquakes or flooding, buffer zones between residential and industrial areas, etcetera) and idle public or private lands (reserved for future uses, vacant due to speculation, lands waiting construction) that have or can be given a productive use in urban agriculture (interim or permanent use).

Typical intra-urban farming systems include community gardens, back yard gardens, nurseries producing tree seedlings, herbs and medicinal plants, production of mushrooms, small livestock in low numbers (poultry, rabbits, etcetera). Part of intra-urban agriculture is at subsistence level or for relaxation mainly and another part is market oriented

Peri-urban agriculture takes place in the zone directly surrounding the build up city. Peri-urban areas tend to undergo rapid and dramatic changes: land prices tend to go up, there is

an influx of people both from rural and urban areas, density increases, multiple uses emerge and land improvement spreads. Such changes effect the agricultural production systems which tend to become smaller scale with more intensive production and a shift from staple crops towards more perishable crops (especially green vegetables) and animal production (meat, eggs, milk). Peri-urban agriculture tends to be very intensive and commercially oriented, providing substantial numbers of jobs.

Urban agriculture normally shows a large variety of farming systems a/o depending on the following factors:

- **Type of economic activities**
Urban agriculture includes production activities as well as related processing and marketing activities, inputs production, services delivery (e.g. animal health services) by specialised micro-enterprises or NGOs, etc. The interactions between these activities are also important (chains, clusters). In urban agriculture, production and marketing (and also processing) tend to be more interrelated in terms of time and space than for rural agriculture, thanks to greater geographic proximity and quicker resource flow. Economies of agglomeration seem to prevail over those of scale.
- **Type of location and tenancy**
Urban agriculture may take place in locations inside the cities (intra-urban) or in the peri-urban areas. The activities may take place on the homestead (on-plot) or on land away from the residence (off-plot), on private land (owned, leased, informal use vacant land) or on public land (formal or informal use of idle public land in parks, along roads, streams and railways, land reserved for future use, etcetera) or semi-public land (schoolyards, grounds of hospitals).
- **Type of products**
Food production may include different types of crops (grains, root crops, vegetables, mushrooms, fruits) or animals (poultry, rabbits, goats, sheep, cattle, pigs, guinea pigs, fish, etc.) or combinations of these. Often the more perishable and relatively high-valued vegetables and animal products and by-products are favoured. Among non-food products figure aromatic and medicinal herbs, ornamental plants, tree products (seed, wood, fuel, etc.), tree seedlings, and so on. Production units in urban agriculture in general tend to be more specialised than rural enterprises, and exchanges are taking place across production units.
- **Scale of production and technology used**
In the city, we may encounter individual or family farms, group or cooperative farms and enterprises, micro-, small and medium-sized enterprises, as well as large-scale undertakings. The technological level of the urban agriculture enterprises may be low, intermediate or high, with a strong tendency is towards more technically advanced and intensive farming systems.
- **Product destination / degree of market orientation**
Part of urban agricultural production is for self-consumption or exchange with relatives, neighbours and friends, with surpluses being traded. However, the

importance of the market-oriented urban agriculture, both in volume and economic value, should not be underestimated (as will be shown later). Products are sold at the farm gate, by cart in the same or other neighbourhoods, in local shops, on local markets or to intermediaries and supermarkets. Mainly fresh products are sold, but part of it is processed for own use, cooked and sold on the streets, or processed and packaged for sale to one of the outlets mentioned above.

- **Type of people involved**

Part of the urban farmers are from the poorer strata of the population (pensioners, unemployed, female headed households) but one will also encounter mid-income level groups (e.g. lower government officials, school teachers, skilled labourers) that are involved in agriculture as a secondary activity as well as full time professional farmers and richer people that see urban agriculture as a good investment for their capital.

One also encounters recent immigrants to the city, but -contrary to the general belief- research indicates that in most cities one finds that an important part of the urban farmers already live for various years in the city since it takes time to get access to urban land, water and other productive resources (see e.g. Drakakis-Smith et al., 1995 and del Rosario 1999) and many of them are not from a rural background but urban people that have chosen agriculture as a way to earn their income (low capital requirements to get started)

Women constitute an important part of urban farmers, since often women have the main responsibility for feeding the households. If the agricultural plot is close to the home, farming activities can be more easily combined with their other tasks in the household than is the case in other jobs that often require travelling to the town centre, industrial areas or “better off” residential areas

Differences between agriculture in rural and urban situations

Due to the differences between the urban and rural conditions and the interactions of urban agriculture with the urban socio-economic and ecological system, conventional rural and urban agriculture vary in a number of characteristics:

	Rural agriculture	Urban agriculture
Farm types	Conventional; farms consisting of interdependent sub-units	Unconventional; partly without soil (rooftop, hydroponics, etcetera); more specialised independent units acting in cluster
Livelihood	Farming is a primary livelihood, engaged full-time	Farming is often a secondary livelihood, engaged on a part-time basis
Farmer type	Usually ‘born farmers’ Strong traditional farming knowledge	In part ‘beginners’: urban citizens engaging in agriculture by necessity or by choice (entrepreneurs); in part recent migrants Weak traditional farming knowledge (that does not apply well under urban conditions)
Products	Staple crops mainly. Cattle, sheep	Perishable products especially green vegetables, dairy products, poultry and pigs, mushrooms, ornamental

		plants, herbs, fish, a/o
Cropping calendar	Seasonal periods	More year-round growing of crops (multiple crop cycles, irrigated, under cover, etcetera)
Production factors	Low land price Lower costs of labour High costs of commercial inputs Variable cost of water	High land price, land scarcity Higher costs of labour Lower costs of commercial inputs High cost of (drinking) water Availability of low cost organic wastes and wastewater
Farmer organisation	Often already in place and more easy to accomplish since farmers share same social background	Often lacking and more difficult to accomplish since farmers are dispersed and have strong variation in social backgrounds
Social context	Community Majority of families engaged in farming and shared social background More homogeneous Relatively stable Few external stakeholders Farmers are more organised	City Urban farmers do often undertake activities outside their own neighbourhood. The percentage of households engaged in farming in a neighbourhood is highly variable. Urban farmers vary in socio-cultural backgrounds Highly dynamic environment with strong fluctuations. Many external stakeholders with different interests and contrasting views on Urban Agriculture Farmers are hardly organised
Environmental context	Relatively stable; land and water resources rarely polluted	Fragile, often polluted land and water resources
Availability of research and extension services	More likely (although in many countries declining)	Hardly available (but individuals may gain direct access to libraries, research organizations, market information, etcetera)
Availability of credit services	More likely (although maybe for larger farmers and males only)	Hardly available (but credit services for the informal sector are available and these might attend farmers too, especially females)
Market	Distant markets; Marketing through middlemen and marketing organisations Low degree of local processing	Closeness to markets; Direct marketing to customers possible and informal chain; High degree of local processing (including street foods)
Land security	Relatively high	Insecure, often informal use of public land, competitive land uses

However, one should think in terms of a **rural-urban continuum**, rather than sharp distinction between urban and rural agriculture. The intensity of the interactions with the urban system differ from location to location and its effects vary from place to place.

The importance of urban agriculture for the development of healthy and sustainable cities

a. Urban food security and nutrition

The contribution of urban agriculture to enhancing urban food security and healthy nutrition especially of the poorer sections of the urban population is probably one of its more important assets.

Food production in the city is in many cases a response of the urban poor to inadequate, unreliable and irregular access to food, and the lack of purchasing power. Most cities in developing countries are not able to generate sufficient (formal or informal) income opportunities for its rapidly growing population. The World Bank (2000) estimates that

approximately 50% of the poor live in urban areas (against only 25% in 1988). It is expected that urban food insecurity will further increase in the coming decades (Argenti, FAO, 2000).

The costs of supplying and distributing food from rural areas to the urban areas or to import food for the cities are rising continuously. In most developing countries the availability of cold storage facilities is still very limited which restricts the types of products that can be delivered by the agricultural areas to the cities and creates relative advantages for urban agriculture.

Urban agriculture may improve both food intake (improved access to a cheap source of proteins) and the quality of the food of the urban poor (poor urban families involved in farming eat more fresh vegetables than other families in the same income category; Armar-Klemesu 2000, Nugent and Bourgue 2000).

It is estimated (UNDP 1996; FAO 1999) that more than 200 million urban farmers provide food for the urban market and another 600 million urban dwellers are actively engaged in urban agriculture for subsistence with exchange or sales of surpluses.

These urban farmers produce substantial amounts of food for urban consumers. A global estimate is that 15-20% of the world's food is produced in urban areas (Margaret Armar-Klemesu 2000). When we focus on specific products, these percentages in most cities rise to 60 % or more of the total supply. To give just two examples:

* in Hanoi, 80% of fresh vegetables, 50% of pork, poultry and fresh water fish, as well as 40% of eggs, originate from urban and peri-urban areas (Nguyen Tien Dinh, 2000);
* in Shanghai, 60% of the city's vegetables, 100% of the milk, 90% of the eggs, and 50% of the pork and poultry meat is produced within the urban and peri-urban areas (Cai Yi-Zhang and Zhang Zhange in: Bakker et al. 2000).

In Europe, USA/Canada and Australia an increasing number of households is taking up gardening or seek to buy food directly from farmers in their own region as a result of concerns about the quality of industrially produced food or social and ecological concerns (healthy food, "buy local and organic", consumer supported agriculture, food box schemes, "slow food" movement).

b) Economic development

National level: Urban agriculture to a large extent complements rural agriculture and increases the efficiency of the national agricultural system in that:

- it provides products that rural agriculture cannot supply easily (e.g. perishable products, products that require rapid delivery upon harvest),
- or can release rural lands for export production of commodities
- and can substitute for food imports (IDRC 1998).

City level: Urban agriculture is an important economic sector, although in many cities a largely informal sector due to lack of official recognition and support. For substantial

categories of the urban and sub urban population urban agriculture is the main or an important additional source of income and for recent immigrants and unemployed people it forms an important survival strategy.

In Ho Chi Minh City, Vietnam, urban vegetable farmers realised an added value per man-day that exceeds two to five times the average wage rate for hired labour even at the lowest prices received by farmers (Jansen et al, 1996).

Studies by Moustier (2001) in Bangui and Brazzaville (Rep. Congo) indicate average monthly incomes from market gardening are 2 to 5 times higher than the estimated minimum subsistence income.

In Port Harcourt (Nigeria) commercial vegetable and flower growing generates a net return of over 60 % to invested capital.

The urban agricultural production also stimulates related economic activities and enterprise development in input supply (e.g. collection of urban organic wastes and production of compost), agro-processing (at household level, by cooperatives or smaller and larger enterprises) and marketing (at the farm gate, with carts or in a local shop or local market, at central markets or to supermarkets and other buyers of the produce).

Special attention is needed for the strengthening of the linkages between the various types of agricultural enterprises in clusters or chains. The municipality and sectoral organisations can play a crucial role in stimulating micro-enterprise development related to urban agriculture.

We should also mention here peri-urban agro- tourism and multi-purpose agriculture in general (see also point c and d) as a “green industry” that is quickly growing in economic importance in many Western cities and larger metropolises in the South.

c) Social impacts

Urban agriculture may function as an important strategy for *poverty alleviation* and *social integration* of newcomers and disadvantaged groups in the urban socio-economic system.

Several examples exist of Municipalities and NGOs that have initiated urban agriculture projects that involve disadvantaged groups such as female headed households, recent immigrants, unemployed youth, elderly people with a low pension etcetera, with the aim to integrate them more strongly into the urban network and to provide them with a decent livelihood (see e.g. Garnett 2000, Gonzalez Novo and Murphy 2000). The projects not only result in food and income but also in a higher self esteem, enhanced self management capacity and more interactions with -and respect of- other actors in the urban society.

Several cities in the USA as well as in other countries use community gardening projects as a way to upgrade certain neighbourhoods by reclaiming open spaces that gradually have become informal dump sites and that often are breeding grounds for drugs deals and crime and turning them, with help of the surrounding households, into "*gardens of hope*" with vegetables, flowers and children playgrounds. The community gardens change the atmosphere in the neighbourhood; participants in such urban greening and gardening projects often feel enriched by the possibility of working together constructively, building their community and in addition producing food and better living conditions.

Urban and peri-urban farms may also take on an important role in providing recreational opportunities for citizens. Once basic needs are covered, urban citizens may undertake gardening more for the *physical and/or psychological relaxation* it provides them, rather than for food production *per se*.

Moreover, intra- and peri-urban agriculture may provide important *recreational services* for the urban citizens: agro-tourism including recreational routes in the sub-urban areas, bed-and-breakfast on farm, direct sales of farm products to tourists (fruits, cheese, marmalade, baskets, etcetera), horse riding, etcetera.

Other urban farms also may develop *eco-educational functions* (bringing youth in contact with animals, teaching about ecology, etc.) or start playing a role in the *provision of care* to people with a psychological disorder.

d) Contributions to urban environmental management

Urban agriculture is part of the urban ecological system and can play an important role in the urban environmental management system.

The fast growing cities produce more and more wastewater and organic wastes. For most cities the disposal of wastes has become a serious problem. Urban agriculture can contribute to solving such problems by turning urban wastes into a productive resource.

In many cities, private or municipal initiatives exist to collect household waste and organic refuse from vegetable markets and agro-industries in order to produce compost or animal feed, but one can also regularly find urban farmers who use fresh organic waste (which may cause environmental and health problems which we will discuss later on).

However, in most cities still the major part of the organic wastes, which conform often more than 70 % of the urban wastes, are (often illegally) dumped or burned (Perla, 1997).

Reuse of composted urban organic wastes reduces the actual problems with disposal of urban solid wastes and replaces the use of expensive and harmful chemical fertilizers by organic compost and prevents soil degradation in the urban agricultural areas.

In addition, compost-making initiatives create employment and provide income for the urban poor (see Lardinois 1998 and GTZ 2002 for an overview of the literature).

Especially in and around cities in the dryer climatical zones, many urban and peri-urban farmers – and especially the poor ones- use urban wastewater (treated, partially treated or even 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. The use of urban waste water provides them with cheap irrigation water as well as of a variety of nutrients, although n not always in the proportions required by their soils and crops. But the use of wastewater may bring along important health hazards if insufficient preventive measures are applied (see the proceedings of the E-conference on “The use of waste water in urban agriculture”, IWMI and ETC-RUAF, 2002 and Moscoso, 1999 and 2003)).

Urban agriculture and urban forestry have a positive impact upon the *greening of the city* (Konijnendijk, 1999), the *improvement of the urban micro-climate* (wind breaks, dust reduction, shade, sequestration of CO₂ and other pollutants) (Heisler 1993) and the *conservation of soil, water, biodiversity* and the cultural *landscape* (Rees 1997).

The importance of urban forestry and agro-forestry for Beijing and other cities in China has recently been described by Chunjiang Liu et al. and by Jianming Cai et al. (Urban Agriculture Magazine # 14, forthcoming). These articles especially highlight the positive impacts of the market oriented government policy leading to a rapid increase in the urban and peri-urban production of fresh and dried fruits and an increase in private tree planting due to the policy to rent out public land to private companies for commercial urban agriculture (tree nurseries, flower production, etcetera) under the condition that 60 % of the land will be planted for multi purpose urban forestry (recreation, water sources protection, storm protection of the city, etcetera).

Cai et al also observe that economic sustainable multi purpose urban agriculture is most probably the only way to maintain the existing and planned *green belts* around the city.

Cities in areas with higher rainfall often use the agricultural areas in and around the city as *buffer and water storage* facility.

By producing fresh foods close to the urban consumers, urban agriculture also contributes to the *reduction of the ecological foot print* of the city and *reduction of the energy consumption* in transport, cooling and packaging of food produced in areas further away.

Risks associated with urban agriculture

Of course Urban Agriculture is not a panacee for all urban problems and its positive impacts wholly or partly may be balanced by negative effects especially as far as public health and environment are concerned, if certain associated risks are not taken into account. Urban agriculture policies and programmes should include adequate preventive guiding measures

The main **health risks** associated with urban agriculture can be grouped into the following categories (Birley and Lock, 2000):

a. ***Contamination of crops with pathogenic organisms*** (e.g. bacteria, protozoa, viruses or helminths) due to irrigation with water from polluted rivers and canals or with insufficiently treated waste water. Especially when contaminated irrigation water is used to irrigate green leafy vegetables and inadequate irrigation techniques are used, microbial contamination of the products grown here may occur (Amuzu and Leitmann, 1992).

Also the unhygienic handling of the products during transport, processing and marketing of fresh products are an important source of bacterial contamination especially of fresh vegetables (Armar-Klimesu et al. 1998).

However, the fear of contaminated urban grown food, whilst legitimate, should not be exaggerated. Health risks associated with urban agriculture should be compared with those of rural agriculture. Research in Accra (Amuzu and Leitmann, 1992) revealed that fresh produce sold at markets was extensively contaminated, regardless of its urban or rural origin (with urban products slightly less contaminated than the rural ones !). However, education of urban farmers and food traders on appropriate crop choice and irrigation techniques is important.

b. ***Human diseases transferred from disease vectors attracted by agricultural activity;***

Malaria occurs in many environments but particularly in areas where irrigation is practised. Malaria in relation to urban agriculture is a serious risk in Africa only. Most malaria in cities is found where temporary water pools with clean, sunlit and shallow standing water can be found e.g. in rice fields and uncovered water tanks .

The mosquito that transfers Filariasis breeds in standing water that is highly polluted with organic matter e.g. pit latrines, blocked sewage drains, cesspits and septic tanks, soak pits and poorly designed sewage-treatment plants. Filariasis is spreading rapidly due to urbanisation.

Also the Aedes mosquito, which is the main vector of dengue, breeds in water containers that include much solid waste (e.g. tin cans, coconut husks, rubber tyres, water storage jars).

Poor disposal of organic solid waste (animal manure, crop residues and other farm refuse) may attract rodents and flies that may be carriers of diseases (e.g. plague, lime, tick born diseases) and scavenging by domestic animals (e.g. cats, pigs and rats) is associated with a range of food-borne diseases such as amoebic and bacillary dysentery.

c. ***Contamination of crops and/or drinking water by residues of agrochemicals***

Intensive use of agrochemicals (fertilisers, pesticides, fungicides) may lead to residues of agrochemicals in crops or groundwater, which may lead to chronic illnesses have been associated to residues in foodstuffs (FAO and WHO 1988). This is more likely to happen in areas with a long tradition in intensive market oriented horticulture.

But research indicates that in most cities even in peri-urban market vegetable farming farmers often prefer organic over mineral fertilisers (De Bon et al. 1997 in Dakar and Kouvonou et al. 1998 in Lomé).

Overuse of agrochemicals is less likely in areas where poor subsistence farmers predominate because they want a clean product for self-consumption or/and because they can't afford agro-chemicals (Lourenço-Lindell, 1995).

In Harare, Bowyer-Bower and Tengbeh (1995) found that chemical pollution of water bodies by industrial sources was far more serious than the worst possible polluting effects of agrochemicals used in urban agriculture.

d. Contamination of crops by uptake of heavy metals from contaminated soils, air or water

The main causes of crop contamination with heavy metals (including lead, cadmium, chromium, zinc, copper, nickel, mercury, manganese, selenium, mercury and arsenic) are:

- Irrigation with water from streams contaminated by industry
- The cultivation on former industrial land contaminated by spilled oil and industrial wastes
- The pollution of crops by heavy traffic (lead, chromium).
- The application of contaminated compost (e.g. by leaking batteries)

The heavy metals may accumulate in the edible parts of crops that are consumed by people or fed to animals. Generally, the highest amounts of heavy metals accumulate in the leaves, whereas the lowest contents are located in seeds. Beans, peas, melons, tomatoes and peppers show very low uptake figures. Plant uptake of heavy metals (especially of cadmium and lead) also varies with soil pH (Iretskaya and Chien, 1999).

Industrial pollution of agricultural soils and irrigation water is a frequent and growing phenomenon. Also in some cities (e.g Bucharest) leaking sewage systems affect soil and water quality negatively.

Air pollution of crops and soils seems to occur mainly down wind of main industrial areas and within 100 meters of main motor high ways.

e. Transmission of diseases from domestic animals to people (zoonosis)

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 (Kathleen Flynn, 1999).

Transmission may take place through the ingestion of contaminated unpasteurised milk from infected cows (bovine tuberculosis), by consumption of meat infected with tapeworm eggs congested by animals that scavenge on human faeces (pig and beef worm) or on food waste and dead animals (trichinosis), through a cut in the skin (anthrax), by drinking from water supplies contaminated with animal urine (Weil's disease), and because of contamination of animal feed (Salmonella and campylobacter). Proper livestock husbandry practices substantially reduce these health risks.

f. Occupational health risks.

Improper handling of agrochemicals may lead to health problems among urban farmers. (Kishi et al, 1995). Similar professional health risks are run by persons involved in the handling of urban organic wastes and contaminated irrigation water.

The main **environmental risks** are:

- a. The contamination of local sources of drinking water if overly high inputs of chemical fertilisers and pesticides are used in this area. Also if excessive use is made of nitrate-rich manure, like chicken or pig manure, groundwater may become contaminated (Rabinovitch and Schmetzer, 97). The wastewater discharge from intensive poultry farms can carry heavy loads of micro-organisms and may contaminate drinking water supplies.
- b. Inappropriate farming practices may -under certain situations- lead to reduction of vegetation and siltation of water bodies (Bowyer-Bower, 1999).
- c. Non farming neighbours may complain of visual untidiness, dust, smell and noise created by the urban farms.
- d. Urban farmers may apply drinking water (treated at high cost) for irrigation purposes, which may be considered an inappropriate use of this resource.

Main constraints encountered by urban farmers

- Review of the literature reveals that the main constraints for the development of sustainable urban and peri-urban agriculture are:
- Restrictive urban policies and regulations
- Lack of organization and representation of urban producers
- Limited access to land and insecure land tenure;
- Limited access to sources of credit and financing
- Lack of support services (agricultural extension, veterinary services, small enterprise development support, etcetera)
- Inadequate technologies and management practices (often not well adapted to the specific urban conditions)
- High production risks in the urban context (pollution, theft, land insecurity, conflicts with local authorities or neighbours)

Favourable conditions for the development urban farming

- Relative competitive advantages of urban agriculture as compared to rural agriculture
- Specific urban demands for products and services not covered by the rural agricultural sector
- Abundant labour force (among others due to rural –urban migration)
- Growing interest in productive reuse of urban wastes
- Growing recognition of the potentials of urban agriculture and attention for multi-purpose land use in the peri-urban zone (agricultural production plus other functions)
- Growing involvement of the farmers in planning and management of the peri-urban zones and green belts and public-private cooperation in the management of open spaces, urban forests, etcetera.

Lessons learnt / Policy recommendations

a. Creation of a conducive institutional environment

- Establishment of a national working group on urban and peri-urban agriculture/spaces
- Establishment of an Office on urban and peri-urban agriculture within each City administration and establishment of a Multi-stakeholder Platform on urban and peri-urban agriculture to jointly design adequate policies and to prepare effective action programmes
- Assisting different types of urban and peri-urban farmers to organize themselves and assist them to analyse their specific problems and needs

b. Intensification of (participatory) research re. urban agriculture

Important areas of research are:

- Characterization of specific needs and perspectives of the various types of urban agriculture
- Development of appropriate technologies for space confined intensive urban farming
- Identification of adequate policy measures to enhance and secure access to land by urban farmers
- Identification of effective strategies to develop effective linkages between the various actors in the urban food chain: input supply, producers, transport, processing,
- Health and environmental risk assessment and development of preventive measures including focussed extension programmes
- Analysis of existing credit and financing constraints and the identification of effective supply mechanisms
- Development of participatory and integrated planning and research methods

c. Integration of agriculture into urban policies and planning

- Inventory of available and suitable land and water bodies for urban and peri-urban agriculture (GIS)
- Inclusion of urban agriculture zones in the city land use plans and development of adequate norms and regulations for the agricultural use of these zones (differentiating these norms according to the characteristics of the location and the type of farms)
- Registration and legalisation of all community gardeners on public land and provision of licenses (with clear conditions and duration)
- Simplification of procedures for leasing, selling and buying agricultural land within the city boundaries

d. Promotion of transition to ecological farming practices

- Support to local initiatives for composting of urban organic wastes
- Support for marketing of ecologically grown products
- Strict control of the sales and use of banned pesticides
- Promotion of rain water collection and recycling of household wastewater
- Establishment of appropriate mechanisms for the marketing of the surplus production of urban small-scale producers

- Prevention of soil/water/crop contamination with heavy metals
- Promotion of multi-functional land use in peri-urban zone and allotment gardens

e. Establishment of appropriate mechanisms for the marketing of the surplus production of urban small-scale producers

- Financial, legal and technical support for initiatives for the creation of “farmers markets”, “green box” schemes, contracts with school feeding programmes, on farm and cooperative processing, establishment of “green” or “regional” labels and other innovative ways to enhance the marketing of locally produced food and other products

f. Prevention of soil/water/crop contamination with heavy metals

- Mapping of the agricultural areas exposed to the industrial contamination and the sources of such contamination
- Promotion of measures to reduce emission of heavy metals by industries
- Where elevated levels of heavy metals are found, farmers to be informed on adequate measures to reduce health risks (like liming, proper crop selection, phyto-remediation)

g. Promotion of multifunctional land use in peri-urban zone and allotment gardens

- Provision of economic incentives for specific landscape and biodiversity management functions by farmers
- Promotion of agri-tourism (touristic routes in peri-urban zone, farm-campings and – pensions, farm sales of produce)
- Support to the modernization of the design of allotment gardens, strengthening its recreational and landscaping functions for the surrounding neighbourhoods

International recognition of the importance of urban agriculture

A recent review of a number of research and development projects on urban agriculture during a workshop in Toronto (IDRC, 2004) indicated that facilitating policies and projects on urban agriculture substantially contribute to the *UN Millennium Development Goals* that were agreed upon by all 191 UN member states in September 2000 and especially so to the goals 1 (eradicate poverty and hunger), 7 (ensure environmental sustainability) and 8 (develop partnerships for development).

International research organisations like IDRC (International Development Research Centre in Canada), IWMI (International Water Management Institute, Sri Lanka), IFPRI (International Food Policy Research Institute, Washington), NRI (Natural Resources Institute, UK), CIRAD (Agricultural Research Centre for International Development, France) are implementing and supporting development research on urban agriculture.

Bilateral donors including the Governments of France, Germany, Canada, Sweden, and my own country the Netherlands are supporting development projects on urban agriculture in various countries.

Multi-lateral organisations like the UN Food and Agriculture organisations (FAO) the UN Development Programme (UNDP) and UN Habitat support the integration of urban agriculture in urban and local policies. WHO-Europe formulated the European Action Plan on Urban agriculture and Food Security.

The European Commission included urban agriculture in its calls for project proposals and its rural development policy more and more focuses on the multi-functionality of the areas surrounding the cities.

In 1996 many of these organisations met in Canada to discuss the research and development priorities regarding urban agriculture and established the International Support Group on Urban Agriculture (SGUA). Since then the group has met regularly to coordinate their strategies and actions and the number of international organisations participating has grown steadily to over fifty.

RUAF: Resource Centres on Urban Agriculture and Food Security

During the SGUA meeting in Canada in 1996 the member organisations identified the need for an information, networking and policy support programme, which in subsequent years was formulated involving organisations from the South.

The RUAF programme started in September 1999. The programme is funded by the Netherlands Government (Department for International Cooperation DGIS) and IDRC, Canada. The first phase ends in December 2004 and a second phase will be implemented in the coming four years.

The RUAF programme is facilitating the integration of agriculture in the policies and plans of national and local governments through the following strategies:

Knowledge management and networking:

- Facilitation of local data gathering and analysis on urban agriculture
- Promotion of networking, cooperation and exchange of research and project results between researchers, policy makers, urban farmers and other stakeholders
- Maintenance of a bibliographic database and a database of resource persons on various aspects of urban agriculture (accessible on Internet and on CD-rom)
- The publication of the Urban Agriculture Magazine (English, Spanish, French, Portuguese and Chinese)
- The production and translation of leading publications on the subject
- The maintenance of RUAF website(s) and Internet access to databases, CD-roms with databases and RUAF publications, publication/translation of “Growing Cities, Growing Food” and other publications

Local capacity development:

- Establishment of 6 regional resource centres (including one in China in IGSNRR, one of the organisers of this conference)

- Creation of regional training capacity on urban agriculture (development of training materials and training of trainers in cooperation with local universities)
- Implementation of regional and local training courses on urban agriculture and multi-stakeholder planning for senior staff of municipalities, governmental organisations, universities and non-governmental organisations

Facilitation of policy development and action planning on Urban Agriculture (in selected countries and cities)

- Preparation of policy briefs and fact sheets on urban agriculture and the organisation of policy seminars
- Assistance in the establishment of local multi-stakeholder platforms on Urban Agriculture and provision of process support to the formulation of local policies and action plans
- Establishment of monitoring systems and provision of feedback to policymakers and urban planners on the social, economic and ecological impacts of their urban agriculture policies and projects

The RUAF programme is coordinated at global level by ETC Foundation and at regional level by: IPES for Latin America and the Caribbean, MDP for Southern and East Africa IAGU for francophone Africa, IWMI-Ghana for Anglophone Africa, IWMI-India for South and East Asia and IGSNRR for China.

The RUAF activities in China will focus on four cities that will be selected on the basis of their commitment to facilitate development of urban agriculture and to integrate agriculture in urban policies and planning as well as their different socio-economic and physio-geographic characteristics. Experiences gained in these 4 cities will be shared with a larger number of “associated cities” through the website, Urban Agricultural Magazine, study visits and seminars, a/o.

The activities in China will be coordinated by Dr Jianming CAI, Department of Urban and Rural Studies, IGSNRR, Chinese Academy of Sciences and implemented in close cooperation with the local government and other organisations in the cities concerned.

The regional RUAF partners in Europe, Canada and USA, Latin America, Africa, South East Asia and China meet regularly (face to face meetings and tele-conferencing) to exchange experiences and mutually strengthen the regional capacities and programmes.

Congratulations and expectations

One of the first major International Conference on Urban Agriculture was held in the year 1999 in Havana, Cuba of which I had the honour to be one of the organisers and which made a large impact on the participating international organisations and resulted in the publication “Growing Cities, Growing Food” that is **just** published in Chinese by **??** .

Since then, many more international, regional and national conferences on urban agriculture have followed in the various regions. To mention just one: the Ministers

conference on Urban and Peri-urban Agriculture for Food Security and Economic Growth in Eastern and Southern Africa organised by FARNPAN, FAO, the Ministry of Lands and Local Government of Zimbabwe, Municipal Development Partnership (MDP) and RUAF which led to the clear commitment of Ministers of several countries and Mayors of various Cities to integrate urban agriculture into national and municipal policies and programmes and agenda with research and development priorities regarding urban agriculture.

I sincerely hope and expect that the International Conference on “Urban Agriculture, Agro-Tourism and City Region development” in Beijing will help to build a good understanding of the potentials of urban agriculture for economic, social and ecological development of the cities in China and the surrounding peri-urban areas and yields similar results as the Ministers conference in Zimbabwe.

Future cooperation

I again apologize to the organisers of this important conference for not being able to attend the conference in person and to participate directly in the international exchange. But please ensure all participants of the Conference of RUAF’s willingness and interest to cooperate with partners in China and to support the design of adequate research projects, policies and action programmes on urban agriculture (as far as our limited human and financial resources permit us to do so).

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