

# URBAN AGRICULTURE: DEFINITION, PRESENCE, POTENTIALS AND RISKS

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## 1. Introduction

Ever since the first French geographical accounts of (intra- and peri-) urban agriculture (UA) were published on Central Africa in the 1960s, scattered and isolated UA surveys by individual social scientists (e.g. Egziabher et al. 1994) have gradually been giving way to institutional projects led by multidisciplinary teams. As a result, more and better information is now available on a larger number of regions, countries and cities around the world. Over the same period, public initiatives pioneered by few local and national governments have been followed by more widespread awareness on the part of local authorities, in their regional and global fora, for the growth and potential of agriculture in and around cities. More urban governments are now seeking to exchange policy and technical experiences to better deal with a spreading phenomenon in their own city.

Initial pilot projects by a handful of donors (Mougeot 1999a) have paved the way to greater collaboration and co-ordination among international support and executing institutions, for information, assistance, training and policy in UA (IDRC/TUAN 1996, SINA 1998).

We must work harder to bring Urban Agriculture (UA) to its conceptual maturity; only with greater internal coherence and external functionality will it turn into a distinctive and useful tool for us to understand and intervene. Key features of current definitions of UA generally have downplayed a critical trait that makes UA to be urban. UA is different from, and complementary to, rural agriculture in local food systems: urban agriculture is integrated into the local urban economic and ecological system. Unless this dimension is enhanced and made operational, the concept will remain little useful on the scientific, technology and policy fronts.

On the ground, UA is growing out of its ability to assist with, resolving or coping with diverse development challenges. It is spurred by a complex web of factors still little understood, not the least of which are urban poverty and food insecurity. Little attention in particular has been paid to the women who tend to predominate

in UA, an activity which connects well not only with their care-taking and house-holding roles, but also increasingly with their need for income. UA practitioners can be categorized variously, based on a combination of tenure modality, time allocation and product destination. Differences are further observed across regions of the world, in terms of prevailing urban agriculture production systems and associated problems.

Official support to UA is age-old, has been diverse and can be organised into several types of interventions, often combined in a single city. Access to resources, land in particular, is central; access is more often an issue than availability per se. But UA production systems have diversified and producers have adapted to cope with these and other urban constraints and opportunities.

We must better understand how urban food systems work if we want to comprehensively assess and promote UA's role and impact on the welfare of particular rural and urban communities. UA tends to complement rural and foreign sources of food supply to cities. It has been promoted to effectively do so and is important to strengthening poor urban households' food security in particular.

Despite limited support and heavy losses, UA is generating products valued in the tens of millions of USD, year in and year out, in major LDC urban centers. UA is comparatively affordable, a noteworthy source of income and savings and is more profitable than rural-based production. The up and downstream effects of UA in the local economy are largely unknown and could be considerable. Low-income UA effectively contributes in several ways to reduce food insecurity by improving food intake of households and by raising children's nutritional status; this relationship could be gender-mediated.

There is little literature overtly condemning UA under any form; opposition has tended to come more from urban planning, public health and environmental circles than from agencies covering employment, community services and agriculture. Governmental checks and balances exist and have been applied to a limited extent. Regulations have remained largely ineffective and must be revised, prioritised and implemented in an appropriate and participatory way; they need to be enabling. Concern over agrochemical use in UA tends to be exaggerated; actual use and related problems are limited by various factors, particularly in the case of intra-urban, home-based, women-practiced, food self-provisioning. More information seems to exist on evidence and on measures to curb public health risks posed to

UA by ambient factors, as opposed to risks introduced by UA into the urban environment. Still, the latter is a source of rising governmental concern. In both cases problems are technically manageable; however, this depends on cities making better use of prevention and mitigating measures, including trans-sectoral coordination (waste management) and the use of UA to enhance environmental quality.

Several trends underway will buttress the growth of UA worldwide and in LDCs in particular. Risks and benefits must be addressed through active policy-making and doing. So far, UA development has been assisted largely by actors in urban politics and agricultural policy circles, for poverty alleviation and food security. This measure of support now is insufficient to deal with the growing risks and benefits posed by the expansion of UA in LDCs. A fuller integration of UA into the urban eco-system requires that urban planners, public health and environmental management actors join in with others committed so far. Areas of intervention at the community, city, national and international levels are identified, where more efforts should concentrate relative to recent progress. More needs to be done by actors on the national and internal planes that will help communities and cities to capitalize on their collective experience and to integrate UA into the city organism in a fairer, more viable and sustainable way.

## **2. Definitions: what is intra- and periurban agriculture?**

### **2.1 Concept development**

Whether we agree or not with the phenomenon, the expression “urban agriculture” (UA), or “intra- and peri-UA”, originally used only by scholars and the media, has now been adopted by UN agencies such as the UNDP (Smit et al. 1996b) and FAO (FAO 1996; COAG/FAO 1999). This makes our need to define it self-evident, at least for our short- and mid-term governance.

Our effort to define UA should bear purpose. The concept of UA should possess a distinctive architecture of its own, both on content and form, and evolve through its interaction with the development of related concepts. Concepts are mental tools that we forge – and eventually rework – to better understand, interact with and modify our real-world experience. They are historically and culturally bound, relevant in some places and less so in others, fitting today but perhaps less so tomorrow. The UA concept needs to evolve out of our need to codify and refine

our perceptual experience with a rather new world phenomenon, so as to ensure that it remains or becomes more useful to us where we will need it. Its identity depends on this external functionality as much as on its internal coherence.

**Internal coherence:** Is UA really what we call, or want to call, what we perceive to be out there? Stevenson et al. (1996) rightly insist on our need to distinguish, for instance, between agriculture “in the periurban zone” and “periurban” agriculture. The overarching definition should lead us into a full conceptual system or edifice, a structure of interconnecting compartments anchored into real-world experience. Another way of looking at this system is to see a pyramid, with lower levels containing larger numbers of more operational and interdependent terms. Within and subordinated to the overarching concept, situational variations should be allowed for the sake of local and regional relevance. To build a useful and viable UA edifice requires probably more materials and engineering than assembled so far.

**External functionality:** How does UA position itself relative to other “kids on the block” (e.g. rural agriculture, sustainable urban development, urban food supply systems, etc.)? The overarching concept should be clear enough so that users can easily perceive its potential for complementarity and synergy with related concepts. How distinctive and value-adding is this edifice in the neighbourhood where it is being built?

We should expect interaction between the UA concept’s internal and external planes to drive its evolution and renew its usefulness. Only then can the UA concept provide a yardstick against which to identify empirical manifestations and gauge how these may reflect the concept, at any given time or location (e.g. the operational translation of the UA concept should enable us to grade specific agricultural activities observed in particular urban areas). A conceptual yardstick is fundamental, as policy and technology interventions need first and foremost to identify meaningful differences and gradations, if they are to better assess and intervene with appropriate means for promotion and/or management of UA.

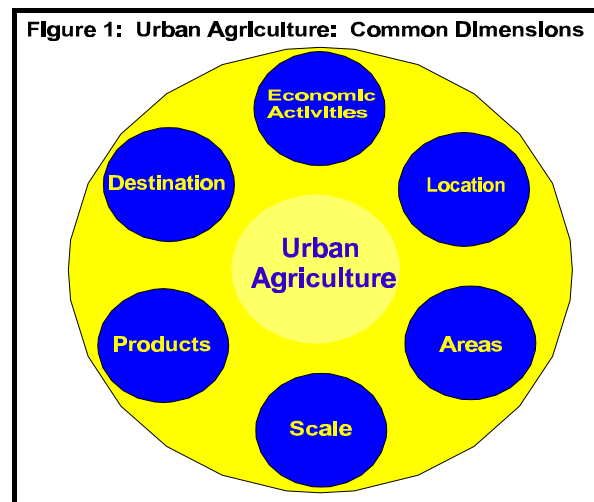
## **2.2 Building blocks of current definitions**

Recent reviews have collated definitions of UA (Quon 1999) and identified shifting emphases in definitions throughout the history of research on UA (Mougeot 1996). This section instead highlights common building blocks of the

concept, reviews them and submits a critical direction for enhancing its conceptual distinctiveness.

The more common conceptual building blocks of UA identified are: types of economic activities, food/non-food categories of products and subcategories, intraurban and periurban character of location, types of areas where it is practised, types of production systems, product destination and production scale (see Figure 1).

**Types of economic activities:** Most definitions refer to the production phase of agriculture; recent definitions add processing and trade to production and stress interactions between these. Besides being sound, commodity analysis affords an integrated approach which is particularly relevant to UA where, differently from most rural agriculture, production and marketing (and also processing) tend to be more interrelated in time and space, thanks to greater geographic proximity and quicker resource flow. This is achieved by small and dispersed units, which make up an extensive and decentralised supply system within immediate reach of a massive consumption market. Economies of agglomeration seem to prevail over those of scale, the latter being more important in rural agricultural production. In UA, economies of scale through co-operative efforts may further enhance the benefits of unit-based vertical integration.



**Food/non-food categories and sub-categories:** The definitions embrace very diverse agricultural productions, though more highlight food productions fit for consumption by either people or livestock; then, mostly cultivated or raised food products (grain, root, vegetable, aromatic and medicinal herbs and fruit crops, and livestock of all shapes and sizes). A smaller number deal with other plants, such as ornamental and agroindustrial (e.g. silk worms, tobacco). Within food crops, definitions clearly stress the more perishable and relatively high-valued vegetable and animal products and by-products. Several studies consider food production exclusively, while others encompass both food and non-food production. As such

systems are often mutually complementary, often gendered, they reinforce not only food security but also economic and environmental benefits at various levels (from individual to city). To exclude the non-food category from the general UA concept would truncate our understanding of the UA system at large. Exchanges are taking place across production systems and within particular production units. Many ways exist in which UA interacts with other urban functions to use and provide resources, outputs and services to the city.

**Intraurban/periurban character of location:** By far the element most common to reviewed definitions is location “in (within) and around” cities or urban areas (e.g. Ganapathi 1983, Sawio 1993, Smit et al. 1996b, COAG/FAO 1999). This element is probably the biggest source of contention, which is why it will be discussed more at length than other elements. Most UA field studies have been carried out in large urban centres, national capitals or secondary cities; thus, few can be assumed to have largely dealt with agriculture located in rural areas “typical” of the respective countries. However, few actually differentiate between intra- and periurban locations. Those which do so have used as criteria, for intraurban agriculture, population sizes, density thresholds, official city limits (Gumbo & Ndiripo 1996, Murray 1997), municipal boundaries of the city (Maxwell & Armar-Klemesu 1998), agricultural use of land zoned for other use (Mbiba 1994), agriculture within the legal and regulatory purview of urban authorities (Aldington 1997). In a rare comparison between rural and urban agriculture, Moustier (1998) defines UA as that carried out within or on the outskirts of a city where a non-agricultural use of local resources is a real option; rural agriculture is found in areas where this option is not an issue. In the CIRAD-Agricongo study of (open-space) market vegetable farming in Brazzaville, for instance, gardens within the city limit are labelled “intraurban” whereas those off-limit (though within a certain travel-time band – see below) are called “periurban” (Moustier 1999).

For **periurban agriculture**, the locational definition is more problematic. In contrast to intraurban locations well within the older and more settled urban fabric, periurban locations are in closer contact with rural areas and tend to undergo, over a given period of time, more dramatic agricultural changes than do locations in more central and built-up parts of the city. Many authors recognise the need to differentiate peri-UA from intra-UA, but criteria used vary widely. For instance, the periurban area is one where “the advantages of combining farm and non-farm work can be maximised” (Swindell, quoted by Binns & Lynch 1998). Sumberg

(1997) applied the OCDE definition to a study of the urban milk system in Dar es Salaam; the Natural Resource Institute supplemented this definition, stressing land shortage and pollution pressures from urban expansion (NRI 1995). In the Greater Accra study, Maxwell et al. (1998) emphasised land-market pressures and changes in agricultural production. In South Africa, a sequence of production systems has been proposed which straddle an urban-rural range of population density thresholds.

Authors have been trying to delineate the outer boundary of the periurban area. Stevenson et al. (1996) say that this outer boundary varies, depending on the reach of those urban influences with the greatest impact on the production system considered. Murray (1997) and Losada et al. (1998) have identified urban and periurban zones within metropolitan boundaries of Quito and Mexico City, for urban forestry and animal husbandry studies. The latter further identified a suburban zone, and characterised all three (urban, suburban and periurban) based on varying ratios of buildings and roads and increasing ratios of open space per km<sup>2</sup> (Losada et al. 1998). Others understand the outer boundary of the periurban zone as some isochrone. This travel-time band is more star-shaped than circular in most cases, stretching out along main road corridors and on flat land, while contracting in wedges and rugged sectors; it can be defined by the travel time of non-resident farmers to their farm or the travel time of specific products to reach the urban market. Lourenço-Lindell (1995) used the area within which people living within the city's administrative boundaries can travel to engage in agricultural activities. Moustier (1998) used the maximum distance away from city centre within which farms can supply perishables to the city on a daily basis; Mwamfupe (1994) used the maximum distance which urban residents could travel to their farms in the periurban area on a daily basis (quoted by Stevenson et al. 1996). Stevenson et al. (1996) themselves proposed the maximum distance within which a given percentage of producers can sell their crop at farm-gate. How far from the city this outer limit will be drawn will depend on the level of development of the local road infrastructure and transportation costs: 10 km wide in Bissau, Guinea-Bissau, but 20 km in Brazzaville, Dar es Salaam or Kumasi (NRI 1995). According to these criteria strictly, this limit falls at least 90 km away from Metro Manila (Ali & Porciuncula 1999).

**Types of areas where UA is practised:** Criteria according to which such areas are typified vary from author to author: location respective to residence (on-plot or off-plot), development status of site (built-up vs open-space), modality of

tenure/usufruct of site (cession, lease, sharing, authorised or unauthorised - through personal agreement, customary law or commercial transaction); the official land-use category of the sector where UA is practised (residential, industrial, institutional, etc.). While some authors have focused on home-plot areas (Lee-Smith et al. 1987, Régis 1999), others have aimed their study at off-plot and open-space locations (Freeman 1991, Mbiba 1994, Kiango & Likoko 1996, Dennery 1996, del Rosario 1999). Misleading comparisons are often drawn across separate studies without due regard to the locational focus of original surveys. Some surveys have encompassed both on- and off-plot locations, under different tenure/usufruct modalities, revealing creative interactions between such locational categories (Maxwell 1995, Sawio 1993, Drescher 1996).

**Product destinations:** Most definitions embrace agricultural production for both self-consumption and some trade (sale, barter, gifts, etc.). Both destinations are usually found to be targeted to varying degrees by the producers or households studied. Economic research recently has been aimed at specific (export) market-oriented production and has helped us to better understand the economic performance of UA and its comparative advantages over other supply sources, both at the producer and consumer level. On the self-consumption plane, relatively more attention must be given to the economics of animal assets and the fungibility of supplemental food self-consumption afforded by UA to households. Whereas in Accra, little attention was paid to the asset value of small livestock, a study in Cairo, a city thrice as densely peopled as Accra and with only 3% of its precipitation, revealed that nearly 30% of low-income households in informal housing had livestock worth on average nearly a full month of income (GTZ 1999).

**Production systems (scale of):** Few definitions clearly include or exclude specific types of production systems *a priori*. Surveys collect data on the different types of systems found in the area under study (see other section for details). Generally, the research effort has focused on individual/family micro, small and medium enterprises, as opposed to large, national or transnational undertakings. However, recent studies show that the bigger interact in more than one way with smaller market-oriented units, often even to the expense of units primarily geared to self-consumption (periurban areas). Corporate outsourcing has been practised for some time in UA, particularly in Asian cities, but trade liberalisation is also making it attractive in a growing number of types of production and cities in Africa and Latin America.



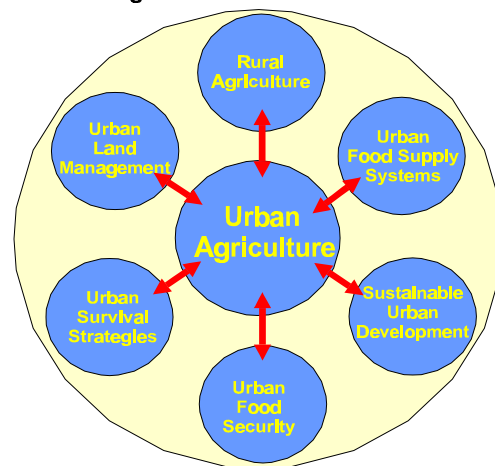
### 2.3 The urban ecosystem connection: a neglected trait of the concept

Most authors define UA only in general terms; this is then often developed into some typologies to organise data analysis on the afore-reviewed dimensions of the concept. Studies rarely use their findings to refine the UA concept of the day (Mbiba 1998) and to clarify UA's distinctiveness, or how UA relates to the body of related development concepts (see Figure 2). Smit et al. (1996b) briefly discuss the connection of UA with the urban nutrient cycle and with the urban food system. Several authors have further incorporated UA in their analysis of related concepts, e.g. on rural agriculture (Moustier 1998); on food entitlements (Lourenço-Lindell 1995); on food security (Koc et al. 1999); on urban households' survival strategies (Rakodi 1995); on urban food supply systems (Smith 1998); on urban land management (Lee-Smith 1998, Girardet 1992) and on sustainable urban development (Mitlin & Satterthwaite 1996). This has generally been done more on a theoretical plan than in operational terms, because of the UA concept's lack of clarity (Lee-Smith 1998, Binns & Lynch 1998, Sumberg 1999).

One striking feature of definitions so far is that few contrast urban and rural agriculture, even less so the implications of one for the other (Binns & Lynch 1998). Indeed, all building blocks reviewed earlier, excepted location, can apply to rural agriculture as well; they do not suffice to trademark UA and justify the need for UA-specific knowledge, know-how and policy. The following paragraphs identify some aspects on which efforts should concentrate and provide some evidence to clarify UA's distinctiveness.

**The lead feature of UA which distinguishes it from rural agriculture is its integration into the urban economic and ecological system (hereon referred to as “ecosystem”).** It is not its urban location which distinguishes UA from rural agriculture, but the fact that it is embedded in and interacting with the urban ecosystem (Richter et al. 1995). Integration into the urban system has been crucial to the persistence of UA,

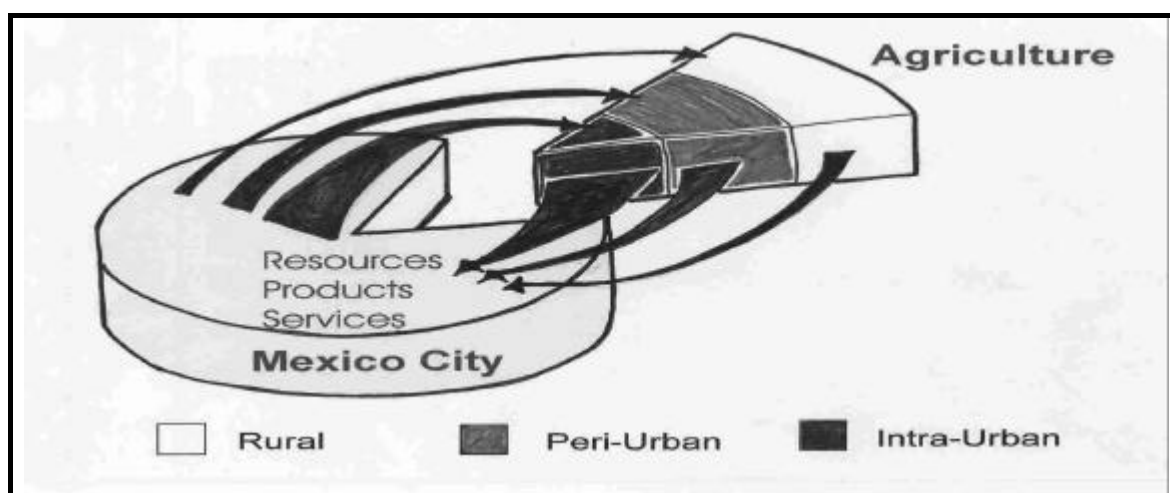
Figure 2: Urban Agriculture and other “KIds on the Block”



more so to its technological and economic influence over rural agriculture throughout history. Probably as old as our cities (Jacobs 1969), UA has not been an exceptional nor a temporary pursuit. Though the nature of cities and of urban food-supply systems has changed, the need for UA to interact well with the rest of the city, on one hand, and with rural production and imports, on the other, remains as true today as it was thousands of years ago.

This integration with the urban ecosystem is not captured in most definitions of the UA concept, and less so developed in operational terms. This is an area in need of much greater attention beyond initial steps taken by a few. For instance, the definition by Smit et al. (1996b) of UA stresses the recycling of urban waste and the catering to the daily urban demand; this adds to the locational feature of earlier definitions an urban input-urban output loop. A revised definition is submitted as follows: **UA is an industry located within (intraurban) or on the fringe (periurban) of a town, a city or a metropolis, which grows or raises, processes and distributes a diversity of food and non-food products, (re-)using largely human and material resources, products and services found in and around that urban area, and in turn supplying human and material resources, products and services largely to that urban area (see Figure 3).**

**Figure 3: “Urbanising” agriculture in (Mexico) city using more from, and supplying more to, (Mexico) city**



The principle of agriculture's integration into the urban ecosystem enables us to recognise three types of situations with regard to the degree to which agriculture found in the city is actually integrated into the city organism (Figure 4):

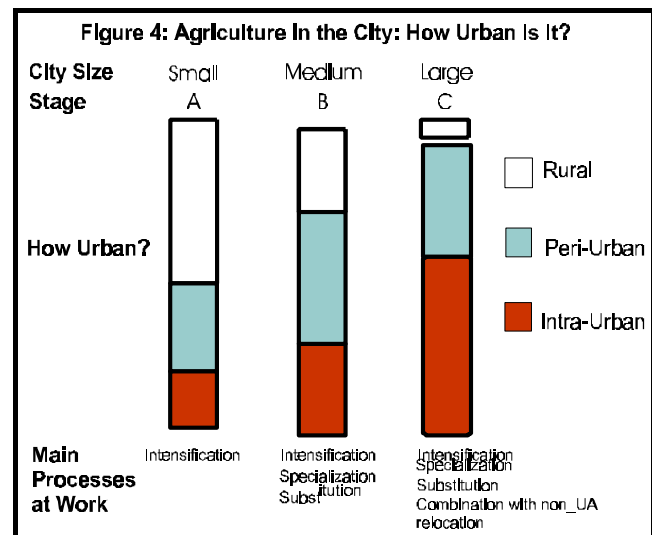
(A) In any given city at any given time, agriculture will be found that is rural, periurban and intraurban in nature, the three interacting and complementing each other to varying extents, with the latter being more integrated into the urban ecosystem.

In order for agriculture found in cities to become more urban in character, this must innovate to cope effectively with city constraints and tap no less effectively on urban assets and flows found and generated by the city. In turn, it benefits this (and others) with its products and services on a daily basis. Agriculture will be more or less urban, according to the extent to which it will use the urban ecosystem and, in turn, be used by this same urban ecosystem.

This concept enables us to assess conditions and policy interventions needed, if any, to move from lesser to greater integration.

Several studies exemplify the principle of integration through comparisons between intraurban, periurban and rural activities. UA is found to complement rural agriculture in terms of self-provisioning, marketing flows and market-supply flows, as shown for instance by CIRAD studies on vegetable and livestock production in West and Central Africa.

**Self-provisioning:** Specific UA productions are important sources of self-provision for all households, anywhere and anytime. Self-provision from some forms of production affords a measure of self-reliance to urban markets at certain seasons and/or periods of time; self-provision is found to benefit households regardless of their income, but is particularly critical to poor households.



**Market supply:** Although UA has been growing in absolute terms in most cities surveyed, its contribution to urban food supplies relative to rural agriculture and imports varies, depending on product and season. UA critically flattens price/variety seasonality by lessening dependence on off-season imports, or making up for reduced supplies from rural agriculture during the dry season.

**Marketing systems:** Fewer levels of trade and a higher percentage of producers are involved in the trade of UA than in rural agriculture or imports. This dispersal of trade corresponds to a dispersal and small scale of UA (demand-supply variability risks, lack of storage and of access to credit by traders). By comparison, the wholesaler-collector function in the marketing system of rural agriculture is much more significant. Volumes traded and transportation costs are larger in rural agriculture, while marginal sale profits and bargaining power of producers against traders are higher in UA (Moustier 1998).

Panigrahi (1995) and Seré & Reinhardt (1995) implicitly use the urban ecosystemic link principle, when identifying distinctive traits of periurban livestock production systems relative to rural counterparts: types of livestock, size and nature of systems are conditioned by urban demand and feed availability; feed resources are generated by urban-based activities (agroindustrial by-products, natural fodder on roadsides and in parks, abundant urban domestic wastes); and form, quality and cost of product constrained by increasingly sophisticated urban consumers. According to the systematic comparisons by Stevenson et al. (1996) of rural, periurban and urban fruit/vegetable production, in Dar es Salaam, the dependence of the production system on urban-origin inputs and on urban-destination outputs clearly increases from the rural (village) to the urban end of the spectrum. At the same time, this growing dependence impresses on production: greater intensification, specialisation, crop value and profit margin.

On the resource level, the urban ecosystemic link of UA has been explored primarily through its reuse of wastes generated by urban agricultural and non-agricultural activities. Growing interest in the link between UA and urban solid and liquid waste treatment and recovery is certainly indicative of the economic attractiveness of the urban ecosystemic dimension of UA.

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

**(C) In any given city and over a period of time, during urbanisation, agriculture of an urban nature will grow as a percentage of all the agriculture found in that city.** In this case, no systematic case study was found on the evolution of UA in a same city over a reasonable period of time.

However, some evidence is available on multiple-year trends for specific systems and areas of Dar es Salaam, Dakar, Hong Kong and Cagayan de Oro, where UA land-based systems have shrunk, intensified or specialised, and have been substituted by more profitable ones, increasingly combined with non-agricultural land uses, when not relocated. Shanghai exemplifies several of these processes at work, with land-extensive systems (vegetables and livestock) moving to the outskirts, while production within city limits is becoming more efficient to deliver higher yields and labour productivity and value-adding (Yi-zhang 1999).

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

In conclusion: the urban ecosystemic link of UA throughout its entire conceptual framework remains to be fully developed. Its conceptualisation currently offers a generic definition and some indications of its distinctive traits. A de-codification of this definition is needed to help us identify its distinctiveness, in both theoretical and operational terms. Efforts in that direction have already begun and are forcing us to distinguish between UA and non-UA in urban areas (the latter will continue to exist with or without a UA concept), between intra-UA and peri-UA, and to examine the place of UA within larger conceptual frameworks. Because UA is claimed or reported to interact with so many facets of urban development, UA also holds the potential to help us diversify and strengthen our urban management strategies. This is not a small opportunity, as city-based electorates struggling for access to food, income and sanitation are increasingly calling the shots in local and national policy arenas.

### **3. Presence of UA: who is involved and why is it important?**

#### **3.1 Who is involved in UA?**

The actors involved in UA are many; they are the suppliers of resources, inputs and services and the producers, the transporters and the processors, the retailers and the consumers, the promoters and the managers. These actors pertain to the public and private sectors, the formal and the informal economy. The political relationships which these actors thread among and between themselves as well as with resources are diverse; they can be complementary and synergetic, competitive and antagonistic, collaborative or adversarial, equitable or exploitative. This section focuses on the relationships among producers, between these and retailers, and between these and authorities, particularly with respect to selected issues such as access to land, rural and urban agriculture, and community welfare. These aspects will then be further developed in the thematic articles of this reader.

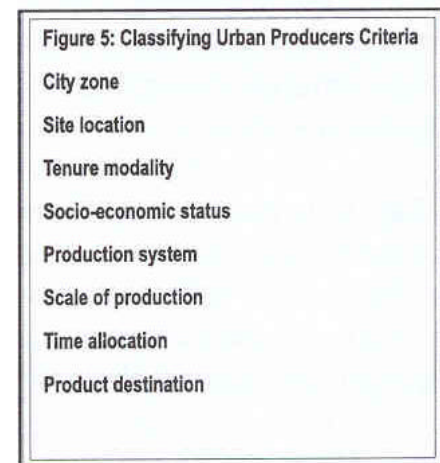
##### ***3.1.i Producers, women producers, classifications***

Many stakeholders are involved in UA, but some do it in bigger ways than others. A California-based winemaker imports Chilean grapes from the Santiago region. A Brazilian electricity utility leases out right-of-way parcels to vegetable growers in metro Rio. A Dominican rehabilitation institution in downtown Santo Domingo has inmates grow and sell hydroponic lettuce to nearby supermarkets and ornamentals to high-income neighbours. Zimbabwe's Harare City Council irrigates cattle pastures with treated municipal wastewater; informal women's co-operatives farm local vacant fields for food and cash. A group of men garden small plots on a church's unbuilt estate in Tanzania's capital, Dar es Salaam. Almost everywhere where fresh dairy products are in demand, senior bureaucrats stall-feed dairy cows on their private estates. In Cuba, public-housing residents in Havana and elsewhere grow home vegetables and rainfed root and grain crops in nearby public open spaces; in Peru, women raise guinea pigs at home for sale in Lima and in secondary cities such as Cajamarca.

However, most urban farmers are low-income men and women who grow food largely for self-consumption, on small plots that they do not own, with little if any support or protection. They tend to come from smaller towns; most are not recent arrivals. For instance, a 1994 survey of three different sectors of Nairobi revealed that over 60% of 177 producers had moved to the city before 1985 (Mboganie-Mwangi 1995).

Recent studies indicate that gender ratios vary greatly from city to city, depending on cultural/religious context, the economic conjuncture, the economic activity, the production system, scale and areas involved. In vegetable marketing, men prevail in market gardening in Brazzaville, Lomé, Addis Ababa and Dakar, while men prevail among producers and women in vending in Cagayan de Oro, Philippines (Schnitzler et al. 1999); in Tanzania, gender ratios in retailing vary markedly between cities, depending on religious affiliation (Yachkaschi 1997).

The different city case studies presented in this reader cover a range of situations in terms of gender involvement and influencing factors. There is no doubt that UA connects well with women's traditional childcare and general household management roles. It allows them to strengthen food provisioning and work close to the home. Most women urban producers are probably engaged in self-provisioning to a larger extent than men (Hovorka 1999). UA is particularly significant for women with larger families to feed and/or support (Dennery 1996, Maxwell 1995). There is evidence that UA can give women greater control over household resources, budget, decision-making and benefits. Many re-invest their savings into their children's education, into small upstream (bulk purchase and retail trade of manure, Haiti) or downstream (food processing and street vending, Nairobi) UA enterprises, as well as into other small businesses (Dennery 1997, Chauca 1999, Moustier 1996).



Classifications of UA production systems/producers are many (see Figure 5). They reflect a combination of production factors, which characterise important segments of UA in any given city: city zones, site locations, tenure modalities, producers' socio-economic status, production systems and scales. Criteria (or combinations thereof) which seem to prevail are: zonal location within the city, modality of access to land, producers' dedication of time and other inputs, and product destination. Some studies have focused on specific categories, such as production systems based at home (Lee-Smith et al. 1987, Chauca 1999) and at open-space locations (Freeman 1991, ENDA-ZW 1997, del Rosario 1999). Others have developed classifications for specific production systems, such as market vegetable (Abutiate 1995, Centres 1991) or animal husbandry production (Centres 1991,

Chauca 1999). In Kumasi and Lomé (Abutiate 1995, Kouvonou et al. 1998), vegetable producers are classified according to time dedication, including three subclasses of part-time producers (urban night-security men, artisans, periurban absentee farmers) and full-time and year-round producers (hiring labour). In Bissau, Lourenço-Lindell (1995) differentiates types of UA based on product destination: subsistence (self-consumption) or market-oriented. More elaborated classifications are based on a combination of tenure modality, time allocation and product destination, for Kampala (Maxwell 1995) and Accra (Zakariah et al. 1998); similar criteria were used by Sumberg (1999). Policy may benefit or affect the future of urban producers, depending on how they account for and intervene on those criteria, according to which particular groups of producers differentiate themselves from others.

### ***3.1.ii How producers gain access to and use urban land***

Producers gain access to urban land from a variety of urban actors, through diverse modalities of tenure and usufruct; arrangements are very often informal and sometimes based on customary law. In surveys available, those gaining access to tracts of land against the will of their owners are a very small minority.

Given the constraints on access to, and on the size of, land plots available for UA at any location, production systems are very diverse in order to make the most and the best use of particular locations within the urban fabric. Areas used are of all sizes, from tiny home spaces (windowsills, containers, fences, rooftops, basements, walls) to recreational grounds, utility and transportation rights-of-way (stream or roadsides), to suburban public or private estates.

Urban farmers may use different spaces in a complementary way over a period of time. For instance, year-round homegardens often serve as nurseries for rainfed off-plot fields, as in Lusaka (Drescher 1996); the same streamside field may carry vegetables in the dry season and grain crops in the wet season. Working several fields at different locations maximises access to critical inputs (stream water and effluents) and to niche markets (ornamentals at crossroad intersections, herbs across from catering facility, etc.), ensures stability against eviction from any particular site or against crop losses because of theft or other hazards.

UA management involves deciding which types of products and what scales of operation should be allowed in different parts of the city. A city may want to avoid major concentrations of stall-fed dairy cattle or piggeries in central districts, where



it may encourage systems integrating stacked small livestock with space-intensive high-valued crops. Even in areas where public open spaces are in short supply, tenure agreements are being sought between urban producers and owners of private or public estates with idle areas (hospital grounds in Lima, golf club in Harare, schoolyard in Santiago, Chile, ocean port grounds in Lomé, etc.).

### ***3.1.iii Promoters – managers***

Various NGOs, governments and international agencies have been supporting UA activities in less-developed countries (LDCs) since the 1970s. NGO initiatives in UA have been very diverse since the 1970s, in all major world regions, and inventoried in a number of publications (i.e. worldwide: Wade 1987, Smit 1996; on Canada: Lifecycles 1998). NGOs have been active particularly in Latin America and the Caribbean (Prudencio 1997) and less so in Africa and Asia, where more NGOs traditionally focusing on rural development are now extending into urban areas. In urban areas, more NGOs have been seeking the collaboration of governmental actors to upscale local UA interventions, such as ENDA-ZW in Harare, Zimbabwe, CEARAH-Periferia in metro Fortaleza in Brazil, CARE Haiti in Port-au-Prince, Haiti, FUNAT in Havana, Cuba, REDE in Lima, Peru, etc. Few evaluations of NGO initiatives in UA are, however, available and more are needed to orient future interventions in collaboration with other actors (Chauca 1999, Régis 1999, Mougeot 1999b).

Examples for official promoters/managers of UA are:

**National and local political leaders' public appeals for self-reliance:** In countries as diverse as Tanzania, Zambia, Cuba, the Philippines, Guinea Bissau and Indonesia, presidents and mayors have called on urban and rural citizens to become more self-reliant in food.

**Provision for UA in city master plans:** New capital cities, such as Doala in the Ivory Coast and Dodoma in Tanzania, have been designed to accommodate UA. Agriculture has been incorporated into urban expansion plans for Kinshasa, Dar es Salaam and Maputo.

**Revised urban regulations:** Bylaws have been revised to allow for specific production systems in specific zones and state agencies have been authorised to promote appropriate practices in such areas, as in Kampala (where roaming cattle

is still prohibited) and Kumasi (Atukunda 1998, Abutiate 1995). Dar es Salaam is one of the most elaborate bodies of legislation on UA in Africa; multi-stakeholder surveys have been used to suggest priority improvements to both text and enforcement (Sawio 1998).

**New institutional mechanisms for UA:** Several countries have created permanent institutional programmes and agencies. These have exploited flexible zoning modalities (Cruz 1999 and Gonzales 1999 on Cuba), purpose-specific leaseholds (Argentina), promoted UA to supply national school-catering programmes (Costa Rica) and legally organised groups of urban farmers (Zimbabwe, Tanzania), entitling them to credit and technical assistance. The Cuban Ministry of Agriculture has created an Urban Agriculture Office for Havana (Altieri et al. 1999) and the Philippino legislation enabled the Cagayan de Oro City Government to establish the City Agriculture Office, now responsible for all UA matters (Potutan et al. 1999).

**Allocation of municipal open space:** Organised groups have been assigned undeveloped public arable land for fixed periods of time (Harare and Gweru in Zimbabwe), and UA has been tolerated as interim or permanent land use in public-housing schemes (Dar es Saalam). In Havana, some 19 ministerial resolutions now protect urban areas under agricultural production. Following decentralisation of food production and release of state-owned land to temporary production in the 1970s, private farms in the late 1980s were supplying Sofia with 48% of its milk and eggs, 53% of its potatoes and about 50% of its vegetables. In Cagayan de Oro, the City Council has issued an initial ordinance allowing urban farmers to use parts of idle land and open spaces.

**Officially promoted UA projects:** In Bissau, where municipal urban regulations do not oppose UA (except roaming cattle), the Federal Government initiated with UNDP a Greenbelt Project which, in the early 1990s, benefited over 2000 cultivators, mostly women, in 14 urban districts (David & Moustier 1993). In Ghana, the Ministry of Food and Agriculture has introduced periurban milk collection to encourage periurban dairying in the Accra-Tema municipality (NRI 1995). Brasilia D.F. furthers the integration of small-scale food production with local food processing and marketing (de Carvalho 1999).

**Direct public engagement in UA production:** National or metropolitan public utilities have leased out land (Brazil), entered in partnership with producers (Senegal) or have become direct producers themselves (Tunisia, South Africa). In Havana, rather than producing it itself, the Ministry of Agriculture is now servicing and acquiring from individual small livestock producers a growing share of the basic meat supply for the city population and businesses (Jorge Luis Castellano, 13 October 1999).

**International agency support to public UA interventions:** Bi- and multilateral development agencies have been supporting more UA actively since the late 1980s: CIDA (Canadian International Development Agency) and GTZ (German Technical Assistance) have supported UA as productive use of metro green belts (Havana and Maputo), SWEDEPLAN has assisted with the inclusion of UA in the design of social housing (Maseru, Lesotho); NEDA has encouraged UA as productive open-space use near high-density residential areas; DANIDA (Danish International Development Agency) has funded fuel wood plantations and credit to female producer co-operatives; SIDA (Swedish International Development Agency) recently funded an East African workshop to inform policy research into rural-urban food production and is currently considering UA as part of a new urban environmental management programme in SE Asia (Bo Gohl, 12 October 1999). French Co-operation has supported market assessments for specific commodities (periurban vegetable crops). United Nations Development Programme (UNDP) and the UN's Food and Agriculture Organisation (FAO) have been providing technical training and feasibility studies for several production systems. UNCHS has supported formal consultations of UA as part of multi-stakeholder action plans for urban management. UNICEF and related humanitarian NGOs such as CARE, OXFAM and CEBEMO (Dutch Catholic co-financing organisation) have supported UA projects. The World Bank, (WB), the International Development Research Centre (IDRC) and the European Union (EU) have supported treatment and reuse of liquid and solid waste in periurban agriculture in Peru, Brazil, Chile and Cambodia (UNDP-WB Water Sanitation Programme guidelines). The WB recently supported projects recommending inclusion of UA as legitimate land use in new city master plans, such as in Uganda; it also commissioned an assessment for comprehensive WB support to UA in SSA (Smit et al. 1996a). FAO has formalised an inter-departmental group and will lead, with ETC Netherlands and UMP (Urban Management Programme of the UNDP), a series of electronic conferences aimed at national and local authorities to identify policy assistance needs on particular UA issues.

### **3.2 Why is UA important?**

This section will provide a brief overview of the external functionality of UA. The issues addressed here are further explored in the thematic articles that follow this introduction. Furthermore, the city case studies provide specific examples for the different function of UA.

UA is one source of supply in urban food systems and only one of several food-security options for households; similarly, it is one of several tools for making productive use of urban open spaces, treating and/or recovering urban solid and liquid wastes, saving or generating income and employment, and managing freshwater resources more effectively.

Today, Smit et al. (1996b) claim that an estimated 800 million people are engaged in UA worldwide; of these, 200 million are market producers, employing 150 million people full-time (Smit et al. 1996b). Denninger et al. (1998) estimate that nearly 25 out of the 65 million people living in urban areas of Eritrea, Ethiopia, Kenya, Tanzania, Uganda and Zambia currently obtain part of their food from UA and that, by 2020, at least 35-40 million urban residents will depend on UA to feed themselves.

Data on several production systems show dramatic growth in numbers of producers, production systems at work, area used, production and yields in several cities. Both output and yields have increased, despite area reduction in market vegetable gardening in Dakar (Mbaye 1999, de Bon et al. 1997). Similar trends are observable in Kumasi (Abutiate 1995), Lomé (Kouvonou et al. 1998) and in local and export specialty crops in Bissau (Lourenço-Lindell 1995). As in Singapore and Hong Kong years ago, Havana and Cagayan del Oro are now witnessing the expansion of small-livestock systems relative to plant crops.

On the urban food-supply side, crop choices, agricultural credit programmes and incentives, technical extension and research, and distribution networks often have been dictated by export and hard-currency earning policies. Official control of food prices has favoured urban wage earners and discouraged rural production. Subsidies are less frequent today, but their removal often exacerbates price seasonality; high transaction costs may discourage rural producers from supplying critical markets; institutional frameworks may not be in place for markets to operate effectively. Economic liberalisation also has made some urban-based

productions more competitive than rural counterparts and has opened up an urban market for local input and implement suppliers; export-oriented crops have even become viable in urban areas (Accra, see Zakariah et al. 1998; Bissau, see Lourenço-Lindell 1995).

On the urban food demand side, devaluated currencies, weakened purchasing power, frozen wages, retrenched public service and formal employment, and removed subsidies on food and other basic needs have curtailed the capacity of both the urban poor and middle class to purchase all the food they need. In 1990, households in nearly half of the largest cities in low-income countries were already spending on average 50-80% of their income on food (PCC 1990). This figure was higher for low-income households; even so, their purchases often have been found not to cover daily minimum requirements. No matter how efficient the urban food supply market may be, rapid urbanisation and growing urban poverty will complicate the demand side of the equation for decades to come. Where periurban production and marketing systems are considered to be efficient, as in Port-au-Prince, the retail price of local vegetables makes them simply unaffordable by the poor (Sumberg & Kleith 1994).

In this context, governments are awakening to one undeniable and gathering trend, but need to better cope with its far-reaching economic, social and political underpinnings: poverty and malnutrition are becoming increasingly urban. More of the rural poor are migrating to the cities, more of the people in cities are being born in poor families and more urban middle-class residents gravitate around the poverty line. If in 1988 at least 25% of the developing world's absolute poor were living in urban areas, by year 2000 these are expected to comprise 56% of the world's poor households (WRI/UNEP/UNDP/WB 1996; UNICEF 1993).

The importance and diversity of UA systems in any given city seems to depend on multiple factors at levels ranging from:

- global (international trade); to
- national (level of development, fiscal/ financial structural adjustment, disasters, agricultural policies); to
- regional (urban food supply system, prevailing agroclimate, strength of agricultural and food traditions); to
- urban (population growth and densities, physical layout, employment levels, consumers' tastes and market niches, legislation); to

- district within the city (urban vs periurban, low vs high income, low vs high densities, residential vs other uses); to
- household (size, dependency ratios, income levels, gendered responsibilities); and to
- individual (education level, particular mix of occupations, farming skills, access to resources, contacts with suppliers/clients).

### ***3.2.i Nutritional benefits***

Self-produced food in cities provides nutritious food otherwise unaffordable (all animal protein in low-income households of El Alto, Bolivia), replaces purchased food staples or supplements these with more nutritious foodstuff, affords savings (as much as 20% of income) which can be spent on non-produced foodstuff or other needs (school fees, transportation), and/or generates supplemental or principal income which can be reinvested in other urban businesses (sewing machine, typewriter, kitchen appliance). Self-production represents anywhere from 18% (East Jakarta) to 60% (Kampala) of total food consumption in low-income households, with sample percentages depending solely on self-production reaching 50% (Nairobi) (Mougeot 1994). In Harare, savings accruing to low-income farmers are equivalent to as much as several months of earnings (ENDA-ZW 1997). In Havana, urban gardens have significantly increased the quality and quantity of food available to the producers' households and their neighbourhood, improved the financial welfare of the households and enhanced the environmental quality of the community (Altieri et al.1999).

From an intervention viewpoint, non-food production may be the way to improve the income and nutritional status of households, depending on prevailing local constraints and opportunities. As Cox (1999) verified in the case of El Alto, Bolivia, severe water scarcity, the emphasis on exotic vegetables and the local plant demand for beautification had women participating in NGO projects abandon original community vegetable gardens in favour of more profitable tree and ornamental nurseries. Exclusive emphasis on food production may be less effective in improving nutritional health, where local food preparation and cooking practices should be corrected or the social status locally associated to particular foods should be accounted for, as verified in Dar es Salaam (Kogi-Makau 1995).

### ***3.2.ii Impact on community welfare***

The impact of UA on urban community welfare is more documented than the impact on the rural counterparts. In low-income urban districts of Bissau,

Brazzaville and Nairobi, urban farmers contribute to community welfare and funeral groups and to formal and informal channels of food acquisition. They generate employment and additional or seasonal income for other basic needs (processed food), link up with the food trade, produce food products otherwise unaffordable, reduce dependence on purchased food, enhance their own exchange entitlement and provide food gifts and meal sharing (Laurenço-Lindell 1996, Moustier 1996, Dennery 1996). In Bissau and Port-au-Prince, the frequent gifting of food by home producers strengthens reciprocity within assistance networks and reduces incidence of theft. Open-space producers also unwillingly contribute to curbing food insecurity through loss of crops, animals and other assets to theft, commonly reported in surveys (Lourenço-Lindell 1995, Régis 1999).

As to rural and urban incomes from market agriculture, in Bissau urban vegetable producers' margin of profit is larger, thanks to direct marketing by the producer; but volumes traded individually are small and corresponding incomes are only a fraction of those of rural traders. A similar principle applies to urban producers of fresh milk. The atomised structure of the production-trade network of UA has major benefits for both the producer and the consumer, which have been largely underestimated, when not openly discouraged, by attempts to dictate price controls and centralise collection and processing. Most attempts have been successfully resisted by the larger part of UA and will continue to be so, until more decentralised strategies are implemented which will safeguard and enhance such benefits.

### ***3.2.iii Interdependence with rural agriculture***

UA tries to complement supplies from rural areas and should be supported to do so. David and Moustier's (1993) study of the vegetable-supply system of Bissau showed that urban production promoted by the government to diversify and buffer the seasonality of supplies to the city has been truly complementing other (rural and foreign) sources. West African cities also frequently offer better conditions for breeding, sheltering, watering or fattening livestock otherwise kept in rural areas (Centres 1991). Stevenson et al. (1996) found that the urban, periurban and rural zones complemented each other in supplying specific produce to the city of Dar es Salaam. Tomatoes, African eggplant, cabbage and onions come from rural locations; eggplant and okra from periurban; sweet pepper from urban and periurban; and hot peppers from periurban and rural locations. In India, both the inability of rural production to meet the growing urban demand for poultry products and the continuing relocation of traditional food processing to urban areas

concur to explain the long-term proliferation and intensification of periurban poultry systems in that country (Panigrahi 1995). Overall, this two-way flow of knowledge, resources and goods for specific productions, and its impacts on both rural and urban communities, remain largely undocumented; such information is needed to devise socially acceptable and economically viable local food systems.

#### **4. Main doubts and risks raised by UA**

Little could be found in the academic literature which would condemn UA at large and advocate its ban under any form. The debate is likely to heat up as UA practice and policy grow in scale and in complexity in the next decades, thus affecting interests in very different and tangible ways. Some have argued that greater public support to UA in large cities would fuel rural-urban migration, while several surveys show that most migrants to large cities come from smaller cities and not from rural areas. The surveys further suggest that migrants arrive in the cities with the initial ambition to work in anything but agriculture and that a majority of urban producers are not recent arrivals. Others have contended that public support to UA could significantly reduce public investments in rural agriculture, while UA needs intersectoral co-ordination of current financial flows much more than major new funding. There is a gathering perception that, in an increasingly urban world, development challenges – among which poverty and hunger reduction – will not be met unless holistic agricultural policies tap on urban and rural complementarities, rather than ignoring them.

##### **4.1 UA hampers urban development?**

The more frequent argument from urban planning is that agriculture should be confined to rural areas, as it can interfere with more productive use/rent of land by other economic activities.

Yet, different UA systems do combine with a range of non-agricultural land uses; for instance, the Centre for Urban and Rural Studies of the Universidad Catolica Madre y Maestra in Santiago de los Caballeros, Dominican Republic (del Rosario 1999) found that in 1997 food crops and livestock were being produced in a third of all 2734 city blocks (38% of the blocks classified as poor, 24% of low-income, 44% of mid-income, 48% of high-income residential, 6% of commercial, 15% of industrial and 23% of institutional).



## **4.2 UA threatens public health?**

Such concerns refer to contamination risks of producers, handlers, consumers and people in the vicinity of production areas caused by crop and husbandry inputs, products and by-products (nuisances, safety hazards). These concerns are legitimate and must be addressed; they arise from practices carried out at wrong places or in the wrong way; they have to do with the quantity and use of agricultural inputs (including feed), choice of production for site characteristics, density of use of site and vicinity (number of animals per unit area), handling of products and by-products.

Particular attention must be given to human health risks and nuisance posed by urban livestock. Flynn (1999) states that the relationship between UA and the rural-urban transition of zoonoses remains largely under-researched. There is evidence from major cities in Nigeria, India, Brazil and Saudi Arabia on human brucellosis infection and echinococcus infection transmitted by domestic livestock. The risk of such diseases spreading is real, as a result of inappropriate zero-grazing and animal-waste disposal in slaughterhouses or densely-populated areas, where space-confined husbandry of swine, goats and sheep is growing (Ayanwale et al. 1982, Pillai et al. 1996, Larrieu et al. 1988, Cooper 1991).

Health aspects of human excreta re-use have been extensively reviewed by the former International Reference Centre for Waste Disposal (1985); a comparative study of 1989 WHO (World Health Organisation) guidelines for wastewater/excreta re-use confirmed their appropriateness (Blumenthal et al. 1991/92). Problems seem to reside with implementation and acceptance. Chinese cities have a long tradition of collecting human wastes and applying “night-soil” to periurban crops, although Ling (1994) argues that treatment processes have yet to be standardised to reduce potential health risks posed by the use of human waste as crop fertiliser or fish feed.

## **4.3 UA has negative environmental impacts?**

Environmental health issues include visual untidiness, soil erosion, destruction of vegetation, siltation, depletion of water bodies and pollution of resources (soil, air, water).

The use of agrochemicals in UA is one source of concern. Depending on the intensity of UA production, their use may vary extremely. Whereas UA for self-consumption relies less on the use of agrochemicals (Lourenço-Lindell 1995), more intensive market production might make excessive use of certain products, as observed in Bamako and Lomé.

De Bon et al. (1997) in Dakar and Kouvonou et al. (1998) in Lomé found that market vegetable farming makes more extensive use of organic than of mineral fertilisers, thereby giving value to sub-products of animal husbandry. In Cuba, the use of chemical fertilisers is prohibited within city limits and producers rely on integrated pest management and organic soil management (Altieri et al. 1999).

Lewcock (1995) found in Kano, Nigeria, that periurban farms are a traditional informal and growing market for large quantities of minimally composted waste; he also found that these producers lacked knowledge on the safety of waste materials for use as fertiliser or stock feed. Few cities outside Asia sell and deliver truckloads to large clients on the urban fringe, or encourage at-source sorting and pre-collection of organic waste by organised groups for local composting and UA use. In Egypt, compost was found to be severely contaminated with heavy metals because of poor sorting of inorganic waste (Lardinois & van Klundert 1994).

In most developing countries, municipal solid-waste management remains centralised, capital-intensive and deficit-ridden. Yet, in several African cities, neighbourhood and micro-enterprise composting has been effective. At-source sorting and doorstep collection is crucial to increase usable volumes and improve the safety and acceptance of organic waste use in UA.

#### **4.4 UA is not very profitable?**

Data available from various sources for several LDC cities indicate that UA makes an important contribution to employment and income generation. In the early 1990s, agriculture provided the highest self-employment earnings in small-scale enterprises in Nairobi and the third highest earnings in all of urban Kenya (House et al. 1993). However, studies are rare which try to systematise the economic contribution of UA at city level. The Mazingira Institute estimated the total worth of on-plot crops grown in urban Kenya at USD 4 million in one growing season of 1985. Freeman (1991) estimated the value of Nairobi farmers' 1987 annual (two-season) off-plot crop production alone to be USD 4 million.

The UA up- and downstream effects on the rest of the urban economy has not been quantified. UA requires inputs and human resources for fencing, crop management, storage, transportation and processing (milling, cooling, drying, cooking, packaging). Income from UA is used to buy processed food, appliances, clothes, and services and can be invested into other small businesses.

## **5. Conclusion**

Smit et al. (1996b) very ably summarized the main risks and benefits, constraints and opportunities which can be posed by and to UA in any particular context; in principle, all are susceptible of meriting some form of policy intervention. The question to this paper is to short-list those policy needs which represent the main "challenges" ahead. Given the literature review, this paper discussed those aspects of UA which currently raise the more important policy "challenges", in other words, issues where there persists clearly a discrepancy between the perceived urgency of interventions and the lack of experience on record to do so. This is why the paper discussed a limited number of issues (food security, land access, gender implications, land use dynamics and urban planning, public health and sanitation, environmental impacts, interaction with RA). The paper cannot claim to treat such challenges comprehensively; fortunately, a very large number of references used for this paper do contain some policy analysis dealing with particular UA systems in intra- and periurban zones, relevant sectoral support needs, governmental levels involved and problem focus (from land provision to marketing).

Still, it is probably fair to say that most recent policy analysis comes from agricultural circles, much less so from urban planning sectors. Without overlooking the critical contribution of the former, the latter is even more fundamental to UA's adequate integration into the urban economic and ecological system. Earlier this year, Canadian Institute of Planners awardee Soonya Quon (1999) reviewed the international literature and surveyed in writing and orally some 26 urban planning professionals from 18 cities around the world, on tools and strategies for urban planners to incorporate UA into city planning, including responsibilities and limitations of urban planners. Opportunities to account for UA include: input to municipal plans and planning policy, use of tools and strategies to realize planning goals (zoning and zoning by-laws, urban land databases and urban baseline studies, environmental impact assessment, public capital investment, subdivision control, economic and other tools.). Urban politicians have been more

accommodating of UA than urban planners have been for-sighted about it. Urban governments need to listen to their planners and these need to evolve a concept of the city more fitting with local reality. Quon also found that, beyond planners' competence and willingness, the planning policy context in which they operate may be inimical to UA, as a result of a lack of awareness of the socio-economic and environmental role of UA, a lack of clear government responsibility, resistant attitudes or cultural norms held by parties in the land use planning process, and a lack of resources, technical and financial support. Quon's recommendations include: changes to land use planning policy to recognise and support UA; recognition of UA through land use zoning with UA being primary or tertiary land use; measures countering the potential negative health and environmental effects of UA activities; new multi-disciplinary institutions responsible for UA, records of UA and of land use and land tenure in communities; education to overcome ingrained attitudes against farming in cities held by various parties in the planning process.

Policy challenges regarding the issues discussed in this paper must be tackled through interventions involving actors working at different levels. Smit et al. (1996b) have proposed a list of interventions in information and research, projects, access to services and resources, policy and planning and cooperation; they indicate in each case which levels of intervention should be involved, for greater effectiveness. The following paragraphs highlight those types of interventions from Smit et al.' (1996b) which should merit a relatively greater policy effort by actors involved at each of the four levels identified by Smit et al.: community, city, national, international.

At the community level (e.g.: city district), good progress has been made to integrate UA into ongoing projects and activities of community development, including environmental regeneration. The more effective and lasting interventions are those that are perceived by the community as assisting with solving key community problems, that actively engage local actors into design and implementation and that strengthen local capacities for pursuit. At this level, more experiences in the North could act as useful references to incorporate UA into local food systems of the South, largely through developing communities' capabilities in this area (Dahlberg 1999; Hamm & Baron 1999). Also, more surveys are being conducted to document UA and inform local institutions. Such surveys are more effective when driven by issue resolution through multi-stakeholder processes, where research alternates with policy formulation for practical interventions (e.g.:

Dakar, Harare and Dar es Salaam in Africa); the participatory dimension of such experience is being emphasized in new models (e.g.: Spies 1998; van der Blik & Waters-Bayer 1996). A range of modalities to improve access to resources, services and inputs, as well as security, have been experimented worldwide, largely through innovative partnerships between key actors. However, much less has been done for providing training in good practice or for assisting urban producers in establishing representative and effective organizations. National and international actors in both the governmental and non-governmental arenas share responsibility in this regard.

At the city level, several urban centers have initiated or completed background studies and discussions for designing or adopting regulatory or promotional policies on UA. Several also have adopted enabling legislation or recognized agriculture as an urban industry. Many more have supported disadvantaged citizen groups. However, much less progress has been recorded in taking stock of that wealth of experience, and in creating institutional structures to implement UA policies; even fewer cities have created city-level food system plans embracing both rural and urban sources. Maxwell (1999) argues that the relative invisibility of urban food security as a political issue in Africa may be due to governments still perceiving this as a household-level responsibility. Pothukuchi & Kaufman (1999) recently examined city institutions that can address more comprehensively urban food systems, such as the city department of food, the food policy council and the city-planning department. Outside Asia, the developing-country experience with citywide integration of the waste management system with the food system is very limited; this includes the use of UA to achieve environmental sustainability. Land use plans and regulatory systems still need to be designed and implemented that promote access to land, water and markets for urban producers; the same can be said of public and work safety programs. At the national level, little progress has been made for setting up national UA or food policies, even though these can greatly influence city-level policies. There are very few national food policies outside Asia that establish synergies between rural and urban production systems and guide urban-agricultural integrated programs. Northern countries' own governments are increasingly being criticized for having agricultural/production policies instead of genuine food policies (Allen 1999; MacRae 1999); the de-politicization of food is contributing to the lack of data, understanding and policy on local food systems (Dahlberg 1998). The application of U.S.A.'s Community Food Security Act to urban community agriculture projects since 1996 is a step in the right direction and may provide a useful reference (Pothukuchi & Kaufman

1999), as well as growing public lobbying for a healthier food policy in Britain (Lang, 1999). Several agricultural departments do extend technical extension to urban areas; this should be adapted, through research and training, to urban conditions and needs of urban farmers (women). There is a good range of experiences with economic incentives (tax alleviation, input subsidies), but much less on model health and land use codes, despite creative partnerships known to have facilitated access to land and water areas.

At the international level, the development of agreements on common research methods is very recent; model codes still need to be developed as a basis for national and city regulatory programs. Very few projects on record have been thoroughly evaluated for lessons to inform models that could assist local agencies with introducing improved UA practices. Comparatives studies of the industry's performance are also lacking, across cultures, climate zones and levels of development and city sizes; these are needed to better advise governments. Hardly any systematic effort has been expended so far to document, evaluate and propose models of effective urban producer organizations. Regional and global networks are developing but these have had a limited impact so far in the creation of national and local networks.

In conclusion, while prohibitive policies are bound to be ineffective, several constraints and risks are clearly associated with non-regulated UA; also, conflict, corruption and competition for scarce resources do exclude from legal UA those who stand to benefit most from it. Clearly, a permissive approach to policy-making would not address these problems and in fact could defeat its well-intended purpose. The tendency of local governments is to move beyond accommodation and into issue management (see Mougeot 1999a). From the experience reviewed, multi-stakeholder governance may still be local governments' best way of managing, if not resolving, such issues. More authors have been calling for a re-regulation of urban food systems and for UA policies to target vulnerable groups, in order to effectively strengthen local sustainability and equity (Smith, 1998; Lee-Smith 1998; see Koc et al. 1999). To be effective, such policies probably will need to include measures that enhance equity and entitlement to food and other resources, that improve urban environmental/sanitation systems managed by the urban poor in their own neighborhoods, and that actively involve urban producers in ranking their problems, developing workable solutions and self-regulating their activities and the quality of their products.

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