

Cities Farming for the Future

Urban Agriculture for Green and Productive Cities

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Local Economic Development and Marketing of Urban Produced Food

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State of debates

If urban agriculture is attracting the growing attention of researchers, policy makers and diverse development stakeholders, it is mostly because it provides some answers to the unique social, economic and environmental challenges posed by fast urban growth (see also the preceding chapters). The dramatic speed of urban growth in developing countries has not been paralleled with the development of enterprises and infrastructure needed to absorb the new employment needs, by contrast to the developed countries where urban development has been much slower (Henderson, 2002). Finally, the context of fast liberalisation and restrictions in the public sector has reduced the possibilities of employment in public administration, traditionally a major provider of employment in cities.

Yet, peri-urban agriculture is still a subject of debate as regards its viability and the necessity for it to receive political support. In a challenging paper, Ellis and Sumberg (1998) provide a number of reasons why scarce public resources should not target urban agriculture. The report stresses that in the light of high land costs in urban areas and the fact that there is still not enough land to cater for housing and infrastructure needs, it would seem legitimate to let agriculture move towards rural areas whilst improving the transport infrastructure at the same time, as has been the case in Europe. Moreover, urban agriculture is subjected to many types of pollution and is itself a pollutant. In fact, urban

agriculture takes advantage of market distortions and can be only transient. But most to the point, the authors looked at the lack of rigorous quantitative data to assess the social, economic and environmental impact of urban agriculture, and compare it with alternative sources of incomes in the city, alternative uses of land, and alternative sources of food.



A night wholesale market in Hanoi

Paule Moustier

In her analysis of the case studies prepared for the ETC Reader on urban agriculture in 2000, Rachel Nugent also points out the informal, small-scale character of UA, and its little impact in terms of income injection into the economy: "agriculture is a residual activity within imperfect markets. As such, it is conducted opportunistically and with relatively little investment. Farmers are more induced in self-subsistence rather than looking at income opportunities" (Nugent, 2000). The survival strategies of urban farmers has also been brought to the fore by Lipton (1977) as part of his famous "urban bias" theory in which he describes urban producers as "fringe villagers, waiting until penury forces them back to the land and meanwhile living on casual work or on their rural relatives". In fact, UA is often presented with the characteristics found typical of the informal sector, which have been summarised by Cole and Fayissa (1991) as small size, family management, labour intensiveness and extra-legal nature. These characteristics generate what economists call the simple reproduction of the enterprise, i.e. the impossibility to generate more than the income necessary for the enterprise to pay for the inputs and means of production involved, and hence the impossibility

for the enterprise to accumulate savings and invest in its development. This process has been particularly well described by a series of studies on UA in Zambia (Rakodi, 1988; Jaeger and Huckabay, 1984): poor gardeners are caught up in a vicious circle when they plant a garden because their jobs do not provide them with enough cash income to feed their family, and they cannot grow more food and thus save money because they do not have cash to buy agricultural inputs, eg., manure, wastes or fertilisers...a typical poverty trap.



Women sell part of their produce at the market of Los Chillos in Quito, Ecuador

Yet, as discussed in chapters 1 and 4, empirical data on urban agriculture generated in the last ten years helps analysts to go beyond the image of the subsistence farmer as the dominant type in urban agriculture. The number of case studies on urban and peri-urban agriculture has increased rapidly and are a comprehensive and valuable source in evaluating the economic and market role and comparative advantage of farming in and around cities. The methods, both in terms of conceptual frameworks and data collection, have improved to take better account of the specific features of urban agriculture, especially its numerous non-market costs and benefits, as well as its non-market organisational

features based on the logic of location and risk alleviation, for which economics of proximity, combining insights from spatial and institutional economics, provide relevant analytical tools. While a frequent focus of prior studies has been the opposition between the informal urban agricultural sector and the urban environment, particularly in terms of policy, the benefits of alliances between agriculture and the urban environment are given more attention now, and a more balanced appreciation of the conflicts and synergies is looked for (Van den Berg et al., forthcoming). It is only through such alliances that urban agriculture can break out of the transient remains of rural agriculture and really gain an "urban nature" as expressed by Donadieu and Fleury (1997).

Urban Agriculture and Livelihood Strategies

Diversity of livelihood strategies

According to UNDP (1996), 80 percent of families in Libreville (Congo), 68 percent of urban dwellers in six Tanzanian cities, 45 percent in Lusaka (Zambia), 37 percent in Maputo (Mozambique), 36 percent in Ouagadougou (Burkina Faso), 35 percent in Yaounde (Cameroon) are involved in urban agriculture. The involvement of so many people in urban agriculture indicates its centrality amongst informal-sector activities (Obosu-Mensah, 1999). Yet the reasons for getting involved in urban agriculture, and consequently, its social and economic impact, vary across different categories of households. A major feature of UA is indeed the diversity of the socio-economic profiles of actors involved, and their varying income and livelihood strategies. Thus, the valuation of socio-economic impact will be different according to the types that are referred to, and not taking this into consideration may lead to differing estimates. Several attempts to classify urban agricultural systems have been made (Bakker et al., 2000; Smith, 1999; Moustier et al., 1999) which can be summarised into the types below and of which the characteristics are found in Table 7.1 (additional types could be added including hobby farmers or speculators).

1. Subsistence home intra-urban farmers (intra-urban and peri-urban areas)
2. Family-type commercial farmers (intra-urban and peri-urban areas)
3. Urban and peri-urban agricultural entrepreneurs (intra-urban and peri-urban areas)
4. Multi-cropping peri-urban farmers (peri-urban areas)

Table 7. 1 *Summary of typology of Socio-Economic profiles*

	Home subsistence farmers	Family-type commercial farmers	Entrepreneurs	Multicropping peri-urban farmers
Location	U (P)	UP	P	P
Outlets	Home	Urban market	Urban market + export	Home + urban market
Objective	Home consumption	Income for subsistence	Additional income Leisure	Home consumption and income for subsistence
Size	Usually < 100m ²	Usually < 1000m ²	Usually > 2000m ²	Usually > 5000m ²
Products	Leafy vegetables, cassava, plantain, maize, rice, goats and sheep, poultry, fruits	Leafy vegetables, temperate vegetables Poultry (sheep) (milk)	Temperate vegetables, fruits, poultry, livestock, fish	Staple food crops, local vegetables
Intensification (inputs/ha)	2	2 to 3	4	1
Gender	F	F + M	M	F + M
Limiting factor	Size	Size, land insecurity, access to inputs, water and services, marketing risks	Technical expertise, marketing risks	Access to inputs Fertility

The proportions may be different elsewhere. In East Africa the subsistence type may be more significant due to the availability of more vacant space within cities. In Latin America and Asia, the types definitely differ across cities.

Subsistence home (intra-) urban farmers

This category involves urban residents who farm around their homes or elsewhere near the city, mostly for subsistence purposes. They raise staple food crops, vegetables, small livestock, and sometimes trees. Drechsel et al., (2004) documents that every second household is engaged in some form of subsistence production in Accra, Ghana. The production is typically seasonal, and the output is used mainly for home consumption, in addition to market purchases. There may also be the occasional sale of the surplus in the market. These survival strategies have been documented by a number of case studies including the ones reviewed by Nugent (2000). Typical examples are maize growing in the districts of Yaoundé, Accra metropolis and Harare; rice growing in Tamale, Ghana and Bandim, Bissau (Armar-Klemesu, 2000; Danso et al., 2002a; Lindell, 1995); and multi-cropped fields cultivated seasonally by elderly women in Brazzaville on the outskirts of the city. Food from subsistence type production is usually of better quality, lower in cost and is more consistently accessible than purchased food (Gerstl, 2001).

Strategies of family-type commercial farmers

Family-type commercial farmers appear to be the dominant type in terms of importance in urban food supply, if not in terms of numbers. The typical crops grown are vegetables. What these farmers have in common is a family background in agriculture, which may also be in

relation to ethnicity. For instance in Buenos Aires where the vegetable growers are mostly Bolivian, the Japanese mostly grow herbs and the Italians grow trees (Craig et al., 2002). Another common feature of these farmers is that they have searched for alternative employment having experienced failures in their studies or former employment; this also reflects the difficult employment situation in African cities, especially for poorly qualified people. Three-fourths of the interviewed vegetable growers in Brazzaville mentioned failures in other jobs as mechanics, taxi drivers, cooks etc. before getting into agriculture. Urban agriculture thus enables the employment of urban people who are quite vulnerable from an economic point of view – yet not as vulnerable as the subsistence farmers. But the activity seldom generates enough income for savings and investment, all the more since access to land is insecure.

In contrast with subsistence urban farmers, who mainly produce for self-consumption, commercial urban and peri-urban farmers are involved in agriculture to earn a monetary income to pay for the numerous expenses in an urban environment (housing, children's schooling, medical expenses). Although they may consume some of their produce, it is only a small portion. Agriculture represents their main household source of income, which may be in addition to other sources of income. In Yaoundé, more than 70 percent of intra-urban

farmers do not have other occupations (Temple-Boyer, 2002); this figure is 85 percent in Abidjan (Yappi Affou, 1999). In Yaoundé, again, 70 percent of commercial producers cited agriculture as their principal source of income, 21 percent cited a job in the formal sector and the remaining 9 percent cited petty commerce. By contrast to these figures, 67 percent of household food producers cited a formal sector job as their principal source of income, 20 percent cited petty commerce, and the remaining 13 percent cited their pension. While none cited agriculture as their principal income source, approximately half did say it was their second most important source of revenue (Gockowsky et al., 2004).



Retail vegetable trade in Hanoi

In peri-urban Hanoi, alongside commerce and craft work, agriculture still provides more than half of the incomes in a municipality such as Trung Trac (Lecostey and Malvezin, 2001). Forty four of 100 farmers surveyed in Cagayan de Ore, Philippines, indicated vegetable production as their main source of livelihood (Potutan, 1998).

As the farmers' objectives are to get regular food and income and secure their livelihoods, the cropping system has to be risk averse, yet have high value crops to cope with small size of land. This is typically the case of leafy vegetables (see also section 7.4 and chapter 11), which are hardly sensitive to water excesses or shortages and to diseases. Their short cycles (two to three weeks) enable regular cash generation. The proportion of leafy vegetables in the cultivated area is 70 percent in Brazzaville (Moustier, 1996). In Yaoundé (Gockowsky et al., 2004), the focus on traditional leafy vegetables and green maize production is observed among both commercial producers and household food producers.

Production systems of this category display common characteristics: irrigation, use of organic matter, cultivation on beds, and small farm size (less than 1ha). This reflects the necessary intensification per unit of land in a context of high pressure on land. As the farmers have differentiated access to land and capital (the higher the capital, the higher the presence of men in the business), the production systems display variations in the following aspects: the

nature of crops grown (low-risk and short cycle crops, eg. leafy vegetables, versus more risky and longer cycle crops, eg. temperate vegetables or ornamental crops); the nature of agricultural inputs; equipment; marketing strategies. The intensification strategies of vegetable farmers have been especially well documented in Kumasi, Ghana by Danso et al., 2002b (see the Kumasi case). Depending on the availability of land, type of production system and location of the farm, the labour requirement differs. In the urban areas, where plot sizes are small, domestic labour is enough to cultivate the land area. In most peri-urban areas, hired, permanent and domestic labour is employed, depending on the above mentioned factors. As the main objective is to get a continuous income, the farmers may change plots and type of crops according to the time of the year. This may give an appearance of seasonality and discontinuity in the farmers' business, but in fact the activity usually continues, although at various locations. While in the dry season, vegetables are grown along the rivers and polluted streams, and with water from dugout wells, shallow groundwater and pipe borne water, farmers may move to non-flooded areas during the rainy season. This was observed in Brazzaville and Bangui where farmers have access to sloping land enabling them to move to higher ground to cope with flooding. In Bissau, on the other hand, women farmers had access only to plots located along the river (the non flooded plots were cultivated by civil servants) and they had to stop growing vegetables in the rainy season, which also explained their limited income (Moustier, et al., 2001).

Urban Agricultural Entrepreneurs

The main differences between this category and the family commercial farmers are the scale of the farms and the use of salaried labour. Urban entrepreneurs, usually civil servants, businessmen or expatriates, invest in intensive temperate vegetable production, poultry keeping, fish farms, or fruit growing, often in combination or with income from other sources. They invest in infrastructure such as motor pumps, treadle pumps, shelters, buildings, and attempt at mechanising certain agricultural operations, eg. irrigation or land tillage. They rely on a salaried labour force for doing most of the tasks. They may lack an agricultural background and the cases of losses and failures are numerous. They often control the marketing of their produce, eg. through direct delivery to stores or with links to export companies. Some examples of this category are the producers of green beans around Dakar, the civil servants involved in fruit production around Yaoundé, the chicken farmers around Ouagadougou and the poultry producers in and around Kumasi. In peri-urban Hanoi, the possibility of access to capital leads to land accumulation and other, non-agricultural, activities. This additional income is invested in agricultural diversification (moving away from rice cultivation to fish-farming, arboriculture etc.) or commerce (Lecostey and Malvezin, 2001).



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A supermarket shelf in Hanoi

Multi-cropping Peri-urban Farmers

This category refers to farmers who share many of the characteristics of rural farmers (and may be called "rurban" farmers), except for the influence of the city in terms of production outlets with a growing share of marketed output; sources of incomes, including agricultural and non agricultural; level of intensification; and specialisation (eg. having some vegetable

fields). They are hardly threatened by urbanisation in terms of land pressure. This category of has been extensively studied in Cameroon IITA. The study reveals that agriculture is often only one of diverse options to generate food and income. Also see the case on Kumasi by Danso et al.).

Dynamics of change

An important question of course is whether an urban farmer develops from one category to another? Is it possible for a farmer to evolve from being a subsistence type to a more commercial type, generate sufficient income and savings to increase the scale of business, and even move on to being an entrepreneurial type? The observation that most entrepreneurs originate from sectors other than agriculture suggests that commercial family farmers find it difficult to increase their scale of enterprise, and that they reach little more than to maintain

(reproduce) their livelihood. This is due to a trap in terms of farm size and available capital, common to many enterprises of the informal sector, viewed as refuge options rather than paths for development. Yet there are some examples suggesting possible avenues for dynamic accumulation and growth from UA. Vegetable farmers in Lome and Cotonou have moved from subsistence to commercial vegetable production, as their savings enabled them to use treadle pumps and then motor pumps, and most of them are now producing for export and local consumption (Keraita et al., 2003). In Kenya, contractual farming agreements



Suoshi, small park in horticultural production base

with livestock agro-industries has enabled farmers to generate substantial incomes (Mireri, 2002). The initial conditions for farmers to enter into such a contract are space (being able to accommodate 300 chicks), the ability to pay for the costs for water, electricity, labour and basic equipment, and the payment of a deposit of US\$ 0,8 per chick. A supporting system in terms of municipal legislation, technical skill development and credit provision is crucial for these patterns of accumulation.

Interestingly, although they are often documented as a necessary condition for farmers to gain easier access to resources, markets and investment, farmers' organisations are rarely documented as successful in paving the way for economic development (see also the section on food markets).

Evaluating Economic Impact

Methodology

Reliable statistics on farmers' incomes are rare due to difficulties such as the diversity of farmers' profiles, seasonality of crops, continuous harvesting of crops (vegetables), scattering of plots and multi-cropping. Establishing a typology of urban farmers and traders and monitoring their incomes is suggested as a means of overcoming this problem. The typology of farmers should account for the variability of incomes in relation to land size, type of products, age, sources of incomes, etc. (see previous section). The typology of traders should account for the variability of incomes in relation to the position in the marketing chain (wholesaler or retailer), the nature of commodities, and the type of customers (popular versus wealthy), all of which vary according to the location of the market. Farmers' and traders' incomes should be monitored at different times of the year, ideally every month, to

take account of the harvests of short-cycle leafy vegetables, or at least during two seasons, the season of maximum harvest (usually, the dry season); and the season of minimum harvest (usually, the rainy season).

In order to assess whether engaging in urban agriculture is a valuable opportunity for urban residents, it is necessary to find references for comparison. In terms of its role in supporting livelihoods, the income from urban agriculture should be compared with the budget necessary to provide for basic food, clothing, and housing expenses in the city. Comparison should also be made with alternative labour opportunities in the city, for varying levels of qualification: for instance, the farming income of a commercial farmer with no qualification can be compared with the income of a cleaner or a guard. The comparison with rural incomes enables to assess the benefits of moving from countryside to city.

Ideally, data on incomes should be computed for one unit of the different factors of production: land, labour, inputs, invested capital, to compare the activity with alternative uses of these factors, in particular for the most crucial such as land. This type of assessment will help to confirm the rationale of urban farmers to invest in crops with the highest returns per unit of land, eg., horticulture and aquaculture. Finally, indicators of risks should be obtained by asking farmers and traders about the variability of incomes (minimum, maximum, standard deviation), within a year and during the five years before.

In order to shift from the household level to the city level, it is necessary to have data on the number of stakeholders involved in farming and trading activities, of the different types, and to extrapolate data gained at the household level using the share of the different types in the total population. The total added value is a useful indicator of the contribution of the sector to the national economy, when compared with the added value of other urban sectors (eg., construction), or to the total urban gross domestic product.

Income from urban farming

A comprehensive overview of monthly farm income from urban agriculture in different cities is presented in Table 7. 2. Case studies conducted by CIRAD between 1989 and 1992 provide interesting estimates of commercial farmers' incomes in comparison to the income necessary for subsistence. In Brazzaville and Bangui, at the time of the surveys, market gardening yielded enough income to provide for the basic food requirements of the family, plus housing, clothing and schooling expenses (Moustier and al, 2004). Hence, even if the total number of farms is small in comparison to the total urban population, their functioning demonstrates that urban agriculture is one of the - too few - sources of stable income that should be protected and considered within a portfolio of other urban cash-earning activities with limited initial capital requirements.

In Kumasi, the incomes of urban farmers occupying open space in low- or bottomlands were estimated at US\$ 400 to 800, which is 2-3 times the income they could make in rural farming (see case of Danso, et al 2002). Urban home gardeners in Ouagadougou are able to earn about US\$ 4 (direct) and US\$24 (indirect) per month. This estimation is comparable to the monthly GNP per capita of Burkina Faso (US\$20), one of the lowest in the world (Gerstl.,2001). In Dar es Salaam, Tanzania, incomes generated from urban agriculture were larger than regular salaries of 67 percent of the respondents.

Following the logic of market forces, farmers develop their limited resource - land - by seeking to add highest value.. As the urban pressure on land increases, a change from food crops to market gardening, flower growing or fish farming can be observed. In Bangkok, shrimp farming, which brings in on average 1,400 bahts (US\$ 34) per hectare per year, is developing and replacing market gardening that brings in only 200 bahts (US\$ 5) per hectare per year, which once replaced rice farming that brought in 40 bahts (US\$ 1) per hectare per year (Vagneron et al., 2003). Greater distances from city centres means lower land prices and



higher transportation costs; there is an optimal distance at which it is the most economically viable to practise agriculture, in terms of highest added value per hectare, as we can see in Figure 7.1. Around Hanoi, agriculture is most intensive 20 kilometres from town, in Dong Anh and Tu Liem Districts, which gives these areas the highest per hectare added value of 85 MVND/ha (5360 US\$/ha).

Table 7. 2 Monthly net income from irrigated mixed vegetable farming in West and East Africa (US\$ per actual farm size)

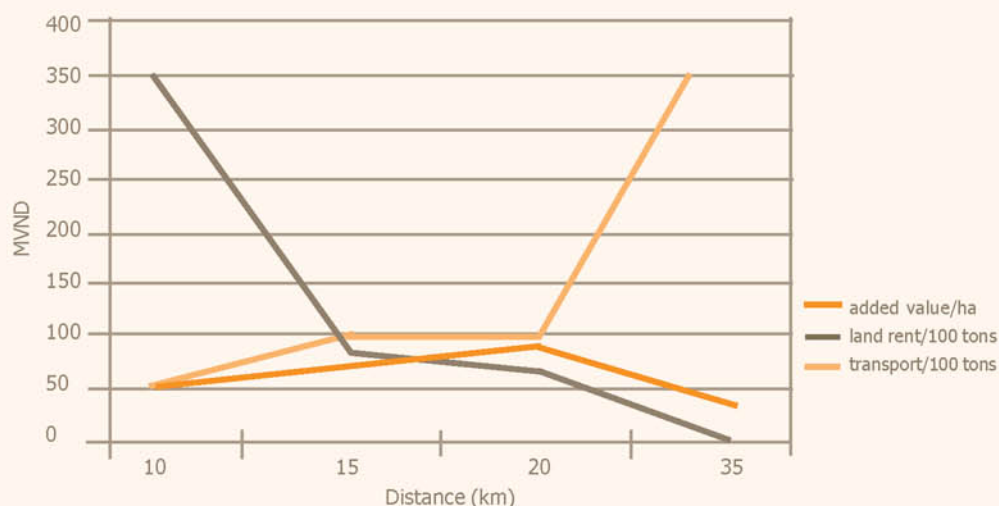
City	Typical net monthly income per farm in US\$ ¹	GNI per capita (US\$/month)
Accra	40 - 57	27
Bamako	10 - 300	24
Bangui	n.d. - 320	22
Banjul	30 - n.d.	26
Bissau	24	12
Brazzaville	80 - 270	53
Cotonou	50 - 110	36
Dakar	40 - 250	46
Dar Es Salaam	60	24
Freetown	10 - 50	13
Kumasi	35 - 160	27
Lagos	53 - 120	27
Lome	30 - 300	26
Nairobi	10 - 163	33
Niamey	40	17
Ouagadougou	15 - 90	25
Takoradi	10 - 30	27
Yaounde	34 - 67	53

Note: GNI – General Net Income (UN statistics); n.d. = not determined/reported

Source: Dreschel et al. (2006)

¹ Some reports lack information on the time/ period (number of harvests, seasons) the revenues are based on. Only a few valued family labor input and depreciated for investment costs. Data were combined in case of multiple reports per city.

Figure 7.1 Impact of distance from Hanoi on agricultural added value per hectare



Source: Le Duc Thinh (data from 2002, to be published): 1\$=15850 VND

Valuation of environmental, social and health impacts

The field of economics has evolved a great deal in the past ten years to better integrate the value and cost of non-marketed goods. As was pointed out by Pareto in 1906, the value of goods is determined by rarity and need. But the availability versus rarity of goods is not necessarily reflected as a financial cost, because the cost may be delayed in time, or not necessarily easy to measure, or because a market does not exist at all. This is typically the case of health or environmental damages, the costs to the population of which are not directly and immediately paid for. Likewise, the needs for some goods or services are not necessarily translated into a market demand, as is the case of environmental preservation for future generations. Economists refer to these indirect costs and benefits as externalities that cannot be translated into the immediate equation of supply and demand. It is legitimate to try to evaluate the indirect costs and benefits of urban agriculture. Land is sometimes used free-of-charge by urban farmers, either because their presence is tolerated on idle land such as near airports (eg. in Cotonou or Bangui), by the side of main roads (in Nairobi) and under

pylons (in Accra, or Cotonou) or because the government has lent some land to them in appreciation of the social role of urban agriculture (in Cuba- Moscow, 1999). But this free use does not mean that the land is of no value to the farmers; in fact, it may actually be a first step towards income generation and becoming capable of paying for more adequate and sustainable land resources. Another typical non-financial benefit of urban agriculture is the role it plays in greening the city, flood proofing and acting as a buffer against urban encroachment. This benefit can also not be captured in direct financial terms.

Paule Moustier



Labelling water convolvulus for supermarkets in Ho Chi Minh City

In order to convince policy-makers of the indirect costs and benefits of urban agriculture, and of the necessary policies to enhance the benefits and reduce the costs, indirect methods of valuation have been tested in certain urban case studies (Henn et al., 2002; Danso et al., 2005). Contingent valuation methods are based on creating shadow markets - simulating shadow situations where people would have to pay for or accept some goods and services and asking people what they would do in such situations.

When damage created (by farming in the city this case) can be repaired (which is not always the case), the costs associated in repairing such damage can provide an estimate of the environmental cost of the damage.

Contingent valuation (CV) has been developed to estimate the users' willingness to pay (for a certain good). A good example of CV is the case study in Cuba (Henn and Henning UAM no.7, 2002) where farmers were asked about their willingness to pay for continuing gardening on their land based on two hypotheses: (i) on their present land; (ii) on land improved in terms of water access and protection from theft. The willingness to pay was appraised by bids, starting from a given amount and then increasing or decreasing it until it reached the acceptable amount. The result is was a value equivalent to 11 percent (without improvement) and 14 percent (with improvement) of their total monthly income, or US\$ 344,000 when extrapolated to cover all urban farmers.

In Bangkok, the willingness of farmers to pay for clean water (which is affected by industrial as well as agricultural pollution) was estimated in a similar procedure of decreasing and increasing bids, starting from 1,000 baht per year (US\$ 24). The average amount that the farmers are willing to pay for unpolluted water is 1,196 baht/ha/year (US\$ 29), and 1,025

importance of UA in the provision of fresh perishable vegetables, mainly leafy vegetables, poultry and dairy products mostly from peri-urban areas (see Table 7.3 for comprehensive data on Kumasi, Ghana and Table 7.4 for various cities in Africa, Asia and Latin America).

Table 7.3 *Origin of different Food Items Sold/Consumed in Kumasi, Ghana*

Food item (Examples)	Metropolitan area Source (%)	Peri-urban Kumasi Source (%)	Rural and import* source (%)
Cassava	10	40	50
Maize	< 5	5	90
Plantain	< 5	< 10	85
Yam	0	0	100
Cocoyam	< 2	< 10	90
Rice	0	< 5	95
Lettuce	90	10	0
Tomatoes	0	60	40
Egg plant	0	60	40
Onions	0	0	100
Spring onions	90	<10	0
Poultry/eggs	15	80	< 5
Meat	5	10	85
Fresh milk**	> 95	<5	0

* Imported are mainly rice, onions and part of the livestock (meat)

** University farm (same in Accra) Source: Cofie et al., 2003.

Fresh vegetables in this category are mainly leafy vegetables such as amaranth, sorrel, morel, cabbage, lettuce and chives. These vegetables top the list of vegetables consumed, in Africa and in Asia. These vegetables are well known for their short shelf life: after one day they are no longer fresh – and in many countries, freshness is an important criterion for consumers who do not own refrigerators. These leafy vegetables are mostly brought into town from distances of less than 30 kilometres from the city centres, be it in Africa or in Asia. The peri-urban percentage of supply is more than 70 percent.

In Africa, improved broiler chicken, milk and eggs come from city farms or from the suburbs. These farms are run by city dwellers, whereas local beef comes from traditional pastoral or agro-pastoral farms. Urban animal food products are also imported from lower-end European production facilities and pose strong competition to certain local products, such as chicken, despite differences in quality (Guérin, 1998). In Addis Ababa, 20 million litres of non pasteurised milk come from back-yard city farms and are sold directly to the consumer by the producer. Butter, on the other hand, comes from rural areas and from as far away as 650 kilometres from the city (Bonnet and Duteurtre, 1998; Tegegne et al, 1999). In Kumasi, 95 percent of fresh milk consumed in the city is from urban agriculture.

Complementarities in Time

A comparative advantage of (peri) urban agriculture may be in the continuity of product supply, either because of specific natural conditions, or because urban farmers are able to sustain continuous production due to more specialised and irrigated systems - characteristics they may share with some specialised rural areas (the case of Lome and Accra). This is also observed in the dry areas of Mauritania, where peri-urban agriculture is able to supply the

market with vegetables on a more continuous basis than the rural areas (Laurent, 1999). In Bangui (David, 1992) and Bissau (David and Moustier, 1993), the share of UA in the vegetable supply increases by 10 percent in the dry season. This comparative advantage is observed especially in the dry season for temperate vegetables, because in the rainy season, the access to non-flooded areas is easier in rural areas. In Hanoi, while 75 percent of tomatoes sold during the cold season are grown less than 30 km from the city, 80 percent of tomatoes sold in the rainy season originate from China and 15 percent from Dalat, located more than 1000 km away from Hanoi (Hoang Bang An et al., 2003).

	Leafy vegetables	Tomato	All vegetables	Maize	Plantain banana	Milk
Brazzaville (1)	80	20				
Bangui (2)	80	40				
Yaoundé (4)	80	25		90	60	
Bissau (5)	90	50				
Nouakshott (6)	90	10				
Dar es Salaam (7)			90			60
Dakar (8)			60			
Kumasi(9)	90	60		10	15	
Hanoi (11)	70	0 to 75 according to season	40			
Phnom Penh (12)	100	0 to 50 according to season				
Vientiane (13)	100	20 to 100 according to season				

The Advantage of Proximity in Market Organisation

Figure 7.2 *Marketing chains for UA and rural agriculture*



The strong involvement of farmers, or their relatives, in the processing and marketing of their products, can be termed as vertical integration (see the case of Brazil of PROVE), which has a positive impact on the reduction of transaction costs in the marketing of perishable products, of varying quality standards¹. This involvement in the chain of production is also explained by the small-scale of production and low prices, making it attractive for producers to spend some hours in transportation to get as much as possible of the final price. Yet these characteristics contribute to further fragmentation of the final supply, while economies of scale could be reached by collective marketing. Experiences of collective marketing are hardly developed in peri-urban areas though, or have had little success, given the variability of production in quantity and quality that makes farmers reluctant to “put their eggs in the same basket” as other farmers who may be unsuccessful and pull down the marketing results. Yet there are some successful examples when farmers have shared similar characteristics, and have identified reliable marketing outlets. Examples are the vegetable cooperatives in Hanoi and Ho Chi Minh City, as well as the vegetable farmers’ groups in Yaoundé who have organised themselves to sell by a rotation formula. The cooperative horticultural marketing by HOPCOMS in Bangalore is another example (Premchander, 2003 (UAM no.9). Yet such experiences, and especially their economic efficiency in comparison to individual marketing, are not sufficiently documented.

Relational proximity is a common feature of the link between farmers and traders in developing countries, especially for perishable products. This has been documented by a number of research studies on marketing chains from rural as well as peri-urban areas¹. What may be more specific to peri-urban areas is the existence of relational proximity between farmers and consumers, and the possibility of direct links between them, as at farmers’ markets where farmers meet consumers directly. These have been especially well documented by Kirwan (2004) in England. In the USA and Europe, urban and peri-urban farmers seek to market their - especially locally grown organic - produce at farmers’ markets. The number of farmers’ markets in the USA had increased from 1755 to more than 2746 in 1998 – but direct sales from farmers to consumers only represented 0.3 percent of the market value in 1997 (Heller and Keoleian, 2000). In developing countries, direct sales are also observed as a way of promoting organic or IPM vegetables, eg. Farmers’ direct delivery to a group of consumers organised in Hanoi and in Phnom Penh with the support of a marketing company and an NGO respectively. This has also been observed among mushroom farmers in Accra who do door-to-door delivery of fresh mushrooms to targeted consumers (Danso et al., 2005).

Low price differential

Short marketing chains contribute to a low price differential for products between farm and final consumption: these account for 30 percent on leafy-vegetables, 35 to 50 percent for cabbage and 75 percent for tomato in Hanoi (Gia B.T., 1999; Son et al., 2002). In rural chains, wholesalers’ incomes may be up to ten times higher than that of farmers, but the risks of bankruptcies are higher. Price differentials are higher for rural products due to higher transportation costs and higher wholesalers’ margins. While the price differential for peri-urban vegetables in Congo shifted from 1 to 2 from farm to retail, the price differential was 1 to 3 for rural vegetables, 20 to 80 percent of the marketing margin being absorbed in

transport costs (Moustier, 1995). And in Havana, Cuba, the prices of tomato, onion, pork and fruit fell from 1 to 3 between 1999 and 1994, the period when the urban agricultural programme was launched (Novo, 2002).

Information on quality and control

The proximity of production areas to consumers, makes it easier for consumers to control quality, and at the same time, keeps producers from cheating on product quality. Most of the supermarkets, shops and restaurants in Hanoi are supplied by three cooperatives located in the peri-urban areas where production along IPM or organic standards is certified by government bodies. Likewise, in Ho Chi Minh City, the cash and carry supermarket is supplied with leafy vegetables by a peri-urban cooperative which gets the support of the department of agriculture and labels their vegetables as safe. Proximity enables frequent contacts between farmers, traders, and consumers and checks on the production process. Proximity between farmers and consumers is not a perfect substitute for independent public control, which is still deficient in Vietnam, but it does reinforce the incentive for farmers not to deceive their customers.

Freshness

In situations of limited access to fridges, freshness of produce is especially valued by urban consumers. In Thiès (Senegal), more than 90 percent of 150 interviewed housewives thought that vegetables should be grown nearby, for freshness and quick access (Broutin et al, 2005). In Vientiane, freshness is the criterion of vegetable choice stated by the highest number of consumers (71 percent out of 100 interviewed, in Potutan et al., 1999). In Hanoi, freshness is the advantage of peri-urban vegetable production cited by 74 percent respondents out of 500 in 2003 (Figué, 2004).

Enhancing Social and Economic Impact

Acknowledging the multi-functionality of UA

Urban agriculture creates landscapes, which is a public good from which users cannot be excluded. This makes urban land management of little interest to the private sector (Donadieu and Fleury, 1997). Urban agriculture produces other things of value to the public: food security, social inclusion and jobs. Within cities, there are other sectors that create landscapes such as parks, to which UA can be linked to and compared with. The advantage of urban agriculture over other 'landscape producers' is that its functioning is supported by market forces, even if these markets are imperfect. It is thus a less expensive landscape producer than a public park. It also provides jobs and social inclusion (esp. Latin America). This multi-

functionality of urban agriculture² makes it a 'cheap' producer of public goods. Table 7.5 compares the 'scores' of three urban sectors: industry, public spaces and agriculture in terms of the production of different goods and services. It shows that agriculture gets the highest combined mark. An increased distance between urban centres and agriculture is, however, inevitable if market forces are given a free hand. Hence, from a political economic viewpoint, it is legitimate that the public sector supports UA agriculture. Four areas of support are particularly relevant: integration into urban planning (see Chapter 3); financial support (see Chapter 4), research and extension for more profitable and sustainable intensive commercial vegetable and animal systems (Midmore and Jansen, 2003; Smith et al., 2004; and Chapter



Fields of leafy vegetable basella (*Basella alba*) covered with straw mulch in Hanoi rural district

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10); and innovative marketing, which will be elaborated in the next section. Municipalities have a crucial role to play in organising such support, in collaboration with national and international programmes.

Table 7.5 *Comparative multi-functionality of three urban sectors*

Products	Sectors		
	Industry	Parks	Agriculture
Landscape	-	++	+
Economic good	++	-	+
Job - Social inclusion	+	-	+
Food security	-	-	++

Source: Moustier (2003); Donadieu and Fleury (1997).

Innovative marketing

Farmers' organisation and information

As established in the previous section, the proximity between production and consumption brings undeniable comparative advantages for marketing yet it also brings some constraints. The small size of gardens and the problems of access to land result in the scattering of plots and the small volumes of transactions. This fragmentation of production (in place and time) makes the circulation of information on market supply difficult among farmers. A solution to this problem is the provision of timely market information to stakeholders: examples are available for Hanoi (see <http://www.avrdc.org/susper>) and Brazzaville (Moumbélé and Moustier, 1995). A solution to transaction volume is to support farmers' cooperation in terms of marketing to limit market gluts or deficits (see the example of the marketing manager in Ghana). Although farmers' organisations can never completely reduce supply instability, which is mostly generated by the impact of the climate on production, it can nevertheless partly reduce it. It can also generate economies of scale. Farmers' organisation should not be imposed from outside but rather be sought on the basis of existing groups sharing common interests and having developed relationships of trust.

Labelling safe UA products

The internal and external sources of product contamination are manifold in peri-urban areas, but the control of quality is made easier by farm proximity to consumers. Farmers investing in quality control efforts should therefore ensure that their products are recognised by customers as such, so that they can keep customer trust and profit from their investments in maintaining quality.

Some successful examples of peri-urban cooperatives that have developed adequate labelling of their vegetables, based on organic or IPM guidelines, are observed in Vietnam (Hanoi and Ho Chi Minh City). The Van Tri cooperative is an interesting example of successful collective action and vertical integration in the chain. The direct sales of Van Tri vegetables by the producers allow regular contact with the consumers, who ask questions and are given answers concerning the production methods used by the cooperative (Moustier et al., 2005). A similar involvement of a peri-urban farmers' group in the production and marketing of safe vegetables, with the labelling including the origin of product and methods of production, and delivery of a supermarket, is observed in peri-urban Ho Chi Minh City (Phan Thi

In the Dutch city of Delft, a farmer was able to negotiate a 12-year lease on 35 hectares of land with the municipality thanks to his commitment to producing organic vegetables and milk, and also setting aside five hectares of the land for nature preservation (Deelstra et al., 2001).

Although it does not specifically target urban areas, Prove in Brasil (small agricultural production programme) is a successful example of multi-dimensional programme aimed at developing small-scale enterprises, especially in regards to processing of agricultural products (see case) (Homem de Carvalho, 2001).

distribution is now well documented (see in particular Mc Michael, 1984; Reardon and Berdegue, 2002). This creates risks of growing distances between food producers and consumers, and reduced possibilities for citizens to exert control on the way food is produced, i.e. decreased food sovereignty: « From a food-democracy viewpoint, one's right to be fed needs to embrace one's right to feed oneself » (Koc et al., 1999).

Durability of food is developed at the expense of its sustainability (Friedmann, 1994). "More rapidly and deeply than before, transnational agri-food systems disconnect production from consumption and reconstruct them through buying and selling (ibid, p. 272). The pressures to reconstruct regional links between producers and consumers is apparent in many places, whether from economic desperation or from urban politics that place a high priority on ecologically-sound land use and uncontaminated foods than on the social and technical imperatives of mono-cultural farming" (ibid, p. 272 and p. 274). The life cycle assessment of the US food system has shown the lack of sustainability of the system, in particular the high cost of energy involved in transport, packaging and refrigeration: the food system absorbed around 5 percent of the total energy consumption in 1991 (Heller and Keoleian, 2000).



Promoting marketing as part of Rosario's UA action plan

The impact of the development of supermarkets and restaurants on the characteristics of supply chains, including proximity versus distance aspects, needs more attention. As seen in the previous section, the proximity between production and distribution can confer advantages to peri-urban farmers in terms of promoting their product quality, which in itself is an advantage for the supply to supermarkets – if peri-urban farmers can ensure regularity of product supply.

Linking research with local development

Research on urban agriculture requires a long-term involvement in the field because of its informal and unstable character. As urban farmers and traders are generally poor, it is not so easy to collect data from them without rewarding them in return, and it is not always easy to convince them of the long-term benefits of research on the economics of urban farming. At present, the literature on urban agriculture can be schematically categorised in two groups: the works of scholars – especially geographers and more recently economists who try to develop a scientific approach on urban agriculture with explicit research questions and hypotheses, often involving Masters or PhD. students who may have difficulties in gaining continuous reliable data in the field - and the work of practitioners, who are very much involved in the field where they try to solve constraints of urban producers through stakeholders' platforms, technical or marketing support – but who may lack the time and skills necessary to carry out rigorous research to evaluate the socio-economic impact of UA and of the innovations in UA. Ideally, teams working on the development of UA should involve people from both research and development (and other stakeholders), be action-oriented and be more concerned with long-term replicability and impact of their work than with one-off assessments which could cause frustration for the UA farmers and for the research community alike. The Cities for the Future Programme of RUAF is seeking to establish working groups in the cities they are working in.

Table 7.6 Summary of indicators of UA social and economic impact

Level of Analysis	Household	City
Income Generation	<p>Income per head of the different types of farmers and traders involved (compared with: subsistence income; alternative occupation; rural incomes)</p> <p>Income per ha, income per labour unit, and income per capital invested of the different types of farmers involved (compared with alternative use</p>	<p>Number of farmers involved in UA of the different socio-economic types</p> <p>Number of traders (and other input-provision and post-harvest enterprises) involved in the marketing of UA of the different socio-economic types</p> <p>Total incomes of and added values to the different stakeholders (farmers, traders, and related enterprises)</p>
Food supply (Subsistence)	Share of self-consumption	Share of self-consumption in total urban consumption, for the different food products, and different socio-economic profiles (including the poor)
Food supply (commercial)		Share of intra-urban and peri-urban areas in the quantities of retail marketing for different food products: based on surveys on quantities/origin in selected wholesale and retail markets
Landscape and environmental preservation	<p>Qualitative appreciation of UA for greening and environmental functions by non farmers</p> <p>Willingness to pay for UA preservation by urban residents</p>	<p>Combination of household based data</p> <p>Urban stakeholder groups' appreciation of UA environmental advantages/drawbacks</p> <p>Use of compost for UA and savings in transport of waste</p>
Social inclusion	Appreciation of "self-esteem" provided by urban agriculture	Number of unprivileged urban residents (migrants, former unemployed) involved in UA

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