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Urban agriculture between allotment and market gardening: contributions to the sustainability of African and Asian cities

L. M. van den Berg
Alterra Wageningen-UR, The Netherlands

Abstract

Due to severe competition for urban space from economically and politically much stronger functions, agricultural production is not considered sustainable in urban areas. Nevertheless, it is found all over the world and plays many different roles, including the supply of fresh food and flowers, a meaningful way of spending leisure time and supplementary income for many of the urban poor in third-world cities. Other roles are the management of green space or temporarily vacant land in cities at very low cost to the local authorities, and the recycling of organic waste. Drawing from a number of case studies in Africa and SE Asia, the present paper shows how difficult it is to play such valuable roles in the face of both imagined and real problems of public health or environmental degradation. At the same time, these urban agricultural producers may have to depend on polluted streams for irrigation, they may cause soil erosion by inappropriate farming techniques, or they may poison surrounding urban residents through the pesticides they apply.

The paper describes how these synergies and conflicts result in a form of land use that could be much more beneficial to the urban system if it were treated by town planners and administrators as a normal urban function in need of both regulation and protection.

1 Introduction

Cities are not sustainable without agricultural production. Most urban residents and administrators alike take it for granted that such production

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takes place away from the cities and is carried out by anonymous producers anywhere in the world. This may be true for the bulk of their food, but niches have always existed in the urban market for food and flowers produced inside the city itself.

It is not accidental that the words 'niches' and 'market' are used in this context. These refer to economic processes and it is primarily economic theory that has been responsible for the policy denial of agriculture within the city. As Sinclair [12] wrote in 1967, it was as early as 1826 that the German agricultural economist Von Thünen developed his famous theory on land value gradients. Basing themselves on this theory, urban planners, administrators and private developers have ever since felt confident in 'eating up' agricultural land to create space for housing and other urban functions. Recently, however, economic theory has begun to accommodate the value of green urban space as a significant factor in price development on the housing market (e.g. Luttik [9]). This does not need to be an 'unproductive' park.

It is only if such parks are used intensively for recreational purposes that one can justify the removal of previous agricultural production units from these spots. Less intensive recreation could have been accommodated by one or a few agricultural enterprises that had adjusted themselves to the urban situation. Even though it has been empirically established many years ago that a view showing natural surroundings makes patients recover more effectively than a view of a blank wall (Ulrich [14]) this is a rather meagre argument to justify the maintenance of such greens if the bushes serve no other purpose than to please the eye. 'Panoramic greens' and 'green buffer zones' deserve additional, productive functions.

Why is it that urban planners and developers meet relatively little resistance when they take away 'prime agricultural land' for urban growth, while at the same time creating vacant land within the city where agricultural production is not permitted? The answer is that classical land economics is quite crude when it comes to urbanisation and driving out rural functions, while the fine-tuning undertaken by urban neighbourhood planning is a purely 'urban' matter. Nevertheless, various forms of agricultural production are found in the city. Why should this be bad, if it serves several functions?

2 Types and functions of urban agriculture

Urban agriculture comes in many different appearances, and many typologies have been proposed for it. In the present context, I should like to use a simple distinction of the following 4 types (table 1). Agricultural production can be practiced in buildings or out in the open, by tilling the soil. Agricultural activities can also be either subordinate to urban activities such as trade, manufacturing, recreation, education or health; or they can primarily be done for production's sake. Such a typology could equally well be applied to agriculture in rural or peri-urban areas and serves to identify four different types of policy that tend to be developed for what is so simply called 'agriculture'.

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Table 1. Four types of urban agriculture, based on differences in function and appearance

		Function:	
		URBAN	RURAL
Form:	URBAN	- gardening centres (retail) - indoor horse-riding centres	- agro-production in breeding cells (fish, hashish, bulbs, etc) - greenhouses
	RURAL	- allotment gardens - "children's" farms - city farms or neighbourhood farms	- farms with landscape management contract - farms with educational, recreational, "care" sideline(s) - small-scale market gardening

However, what such policies have in common is that agricultural production (unlike industrial production!) has to serve more than one function in order to be allowed or given a proper chance anywhere near or in the city. Whatever form the agricultural activities may take, the production of food, flowers or animals will always be one of these functions, but without a second function urban farmers will not get their licence to produce. Table 2 lists a number of these non-production functions that agriculture can perform in cities.

Table 2. List of possible functions of urban agriculture

The Multiple Functions of Urban Agriculture	
- *agricultural production* (food / non-food)	- education
- supplementary household income	- supplementary household diet
- managing green open space	- employment
- amenity – 'open view'	- urban planning reserve
- energy / heat production/ consumption	- water management (quality/quantity)
- retailing	- recreation
- recycling CO_2 (by greenhouse farmers)	- care (e.g. of the handicapped or those suffering from urban stress)
- fresh air and tranquillity	- recycling urban wastes (solid and fluid)

It is obvious that not all functions can be performed by all types of urban agriculture. Production in buildings (greenhouses, sheds, basements, etc.) is a special case. It is unlikely to add to 'amenity' or fresh air, but it may play its 'urban planning reserve' function just as well as land-based production out in the open. For instance, if the basement of an apartment block proves too damp, dark or low for human habitation, storage or retail outlets, it could be very suitable for the production of mushrooms, pork, hashish or other agricultural commodities. Or, as can be seen in some of the major cities in the USA, greenhouse farmers whose land in the peri-urban area is under pressure from suburban development dismantle their greenhouses and rebuild them on abandoned land in blighted zones near the city centre, where they produce speciality crops for the expensive restaurants in the nearby downtown area

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(Pothukuchi & Kaufman [11]). They have to use tables and bring in their black earth from elsewhere as the local soil is often contaminated.

3 Focus on farming on public open space

Intensive agricultural production in buildings in cities, especially animal husbandry at household level, is more widespread than we think. But apart from making a strong plea for its inclusion, promotion and regulation in the urban planning system, this type of farming will not be discussed in the present paper (see, however, van den Berg [3]. Instead, this paper focuses on different types of land-based farming in the open air, which perform or could perform most of the functions listed in table 2. This excludes the interesting phenomenon of rooftop farming, which is well documented by Gavrilov [7] for the Russian city of St. Petersburg. Another widespread type of urban agriculture not dealt with in this paper is that practised in private gardens, not only in low-density residential areas but even under the most crowded slum conditions. Many examples of such slum gardening can be found in a 1999 Havana Workshop report edited by Bakker et al. [2]. In middle- and higher-income residential areas of African cities many residents manage quite efficient production units of vegetables, ornamental plants or animals in their private gardens. After blocks of agricultural smallholdings around cities like Nairobi or Lusaka have been subdivided and turned into expensive residential areas, the agricultural sector seems to regain ground in many a residential lot. But there is also the example of the upper-class Dakar residents who used a foreign-funded dairy project to develop large tracts of peri-urban space into private residential lots with some 'hobby farming' (Ba Diao [1]).

The privatisation of public open space within and around cities is one of the dangers facing urban and peri-urban agriculture. Such space is rarely used consistently for agricultural production that befits the economic pressure on the land. The new owners either turn it into their own leisure-cum-privacy domain or 'develop' the land to make money: they build on it and sell or rent their newly created urban space. Experience in Europe, Latin America and Africa has shown that the public nature of much open space in urban areas, whether *de facto* or *de jure*, is almost a precondition for it remaining without buildings. Of course, it is no guarantee (far from it!), but at least the involvement of the general public and local government on its behalf gives green open space the chance to serve public rather than only private interests. This is where, at least in the European urban planning tradition, the organised complexes of allotment gardens and the 'children's' or city farms arose in the course of the 19th and 20th centuries. As Drescher [4] recently pointed out, these gardens were a response to similar conditions among the urban poor and similar 'informal' gardening practices as those presently found in the cities of Latin America, Africa and Asia. In Germany, for instance, it was a 19th-century physician (Daniel Schreber), who (in the words of Drescher) "wanted to create possibilities for children in cities to get them away from the street, bring them on the fresh air and give them a useful occupation". This is

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why the allotment gardens in Germany are still referred to as "Schrebergardens". Idealistic groups (which we would nowadays call NGOs) would lease parcels of public land and subdivide these into gardening lots of 20 by 10 or 20 by 20 metres. Under the German climatic conditions, these have proved to be an effective buffer for household food security, especially in times of crisis. It is interesting to observe that in recent years a slowly increasing number of cities in Latin America, but also in the Philippines, have adopted a positive course similar to that taken by the West European cities from the 19th century onward. This is reflected in the case studies from Havana, Lima and Cagayan de Oro in Bakker et al. [2]. In other cities, like Mexico, La Paz, and in Asia Jakarta and Hubli-Dharwad, there is still no official recognition of urban horticulture, despite numerous advocacy initiatives by local and international agencies.

In addition to these options for the subsidiary gardening type of urban horticulture there is the other, largely Western phenomenon of 'children's farms' or 'city farms'. These are primarily educational centres, found in urban parks or near schools, where urban children can get very close to farm animals and basic agricultural practices right in their own neighbourhood. Such 'farms' are either run by a local council department or by associations or foundations with the support of city or neighbourhood councils. Local businesses often act as sponsors. Although their main function is educational, these centres also act as asylums for all kinds of pets or farm animals people have tried to but are no longer able to keep in their homes. Their managers seek nearby plots of land where they can cut the grass, grow some crops or allow some animals to graze. These are all small bits and pieces, rather changeable and demanding a great deal of volunteer labour. Depending on the local situation, activities like bee-keeping, pony-riding, deer-breeding or city-park management can dominate such 'farms'.

Although agricutural production is of course a very subordinate goal of these 'city farms', the idea of harvesting something from otherwise unused urban land makes them popular with all kinds of volunteers. Some are also organised in such a way that they allow people with physical or mental disabilities a meaningful and healthy way of spending their days. Such attempts to use the productive capacity of green urban space for fodder or manure, with the support of nearby schools and neighbourhood committees, would reduce rather than increase the cost of municipal park management.

And finally, there still is the truly commercial type of vegetable, flower, fish or other crop production in open space in urban areas. Ornamental plants are grown commercially in almost every single city. Leaving aside those in private gardens, the verges of roads or small portions of shaded public land next to residential plots are equally popular for this speciality. Vegetables or sometimes even staple crops like maize or rice are often grown commercially in strips along roads and railway lines, usually on land that is kept in reserve for the possible widening of such infrastructure features at some future date. Other popular areas in towns are those that are liable to flooding and not yet

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in sufficient demand to warrant their relatively expensive preparation as building sites.

4 Real and imagined risks of urban agriculture

A great deal of scepticism surrounds the advocates of urban farming: (a) it is said to cause nuisance for the surrounding urban residents in the form of bad odours, noise and dangerous chemicals, while stray animals may cause havoc on the streets and in private gardens; and (b) the agricultural products are likely to be contaminated by urban pollution and therefore dangerous to consume. In addition (c) many local authorities blame urban gardeners for soil erosion on riverbanks or for creating breeding grounds for malaria mosquitoes; and (d) why bother to cultivate the land, plant seeds and apply fertilizer and pesticides only to see the crops harvested or vandalized by people without respect for these efforts?

These are objections that should not be treated lightly. Food that comes from allotment gardens should be tested just as regularly as that which comes from large, commercial growers outside the city. If some urban farmers are found to apply water from polluted streams or wells they should be warned and advised on alternative water sources or the production of non-food crops. If the chemicals they spray are found to penetrate nearby homes, they should be forced to stop using them and employ more organic farming methods, etc. Each of these problems can be solved and none of them provide a reason to discourage, suppress or prohibit agricultural production in urban areas in general, especially in the light of the many positive functions of urban farming. The main challenge is to strengthen its synergy with the city and to remedy any risks or conflicts. Table 3 summarizes these aspects for the three dimensions of sustainability.

Table 3. Two sides to the sustainability of urban agriculture

Dimensions of sustainability of Urban Agriculture			
	Environmental	*Economic*	*Social*
Synergy	- plant nutrients in urban waste & sewage - health aspect in the context of 'urban greening'	- access to inputs and markets - amenity - employment and poverty alleviation	- meeting human needs for green (recreational) urban space
Conflict	- urban pollutants in agricultural produce - agro-chemicals in urban environment - urban greening and nature-borne diseases	- competition from urban land-use systems - vandalism and theft	- negative perceptions of (peri-) urban farming

There are at least two reasons why the conflicts and risks of urban agriculture tend to be taken much more seriously by city administrators and the general public than its synergy with the urban system. The most obvious reason is the

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direct link between food and health. Everybody has the right to safe food and should be able to trust that the food he or she buys has been checked for poisonous or pathogenic components. Or they should at least be sure that simple measures like washing and cooking will make them safe to eat. If such commodities come from far away anonymous producers, people are willing to give them the benefit of the doubt. But if they are produced at their doorstep and they know that the water used for irrigation is heavily polluted, people may well refuse to eat the produce, even if they have no choice. No public administrators want scandals about food safety in their constituency, and banning food production altogether is the easiest way to avoid being blamed if something goes wrong. Urban food production is formally declared illegal while informally tolerated, as long as there are no serious complaints. Those who consume these crops do so at their own risk. It is obviously much more demanding for urban administrators to try and encourage urban food production and at the same time maintain the required infrastructure for safe consumption and against other negative side-effects, but it is possible and it is being practiced in a slowly increasing number of cities. The case studies below show the great variety of things involved.

The second reason for especially the better-off urban residents to be sceptical towards local food production is that they associate it with rural poverty, and consider its presence in the city as a sign of administrative and economic weakness of their city. Many of them have themselves migrated from a poverty-stricken countryside and associate the urban cultivators with that same poverty. Cities are there to escape from poverty and primitive means of subsistence. Expensive urban land should not be 'wasted' by using it for agriculture: skyscrapers are far better symbols of urbanism. It takes a few generations for urbanised people to forget their rural roots and become naively positive and curious again as to how their shoes or milk or tomatoes are produced. For them, it is fun rather than primarily an economic or food-security necessity to try and produce some of these commodities themselves or see them being produced in their own neighbourhood.

5 Southern Africa: the cases of Lusaka and Harare

Reports on urban horticulture in Southern Africa all tend to focus on the informal gardening type on vacant land for home consumption (eg. Smith [13] and Mbiba [10] for Harare and Drescher & Muwowo [5] for Lusaka). Commercial market gardening is very much restricted to some peri-urban areas or farms much further away from the city. It seems as if the many efficient smallholder farms that existed in and around Lusaka's suburbs in the 1960s and 70s (van den Berg [3a]) have dwindled as the town engulfed them: they were neither spared nor shifted. In Harare, too, market gardening seems a non-issue for policymakers and researchers alike. Without wanting to sound sentimental, I have to say that these highly productive, irrigated horticultural units between the various suburbs of Lusaka were a pleasure to behold. At the same time they also produced delicious, fresh commodities, including the

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strawberries for both local and export markets from the then famous 'Walkover Estate': what is in a name!

What remains are 'illegal', seasonal fields of maize and groundnuts on public or vacant land, which Mbiba [10] calls 'exploiting the commons'. The cultivators, usually low-income people, both men and women, from relatively nearby residential areas, are answering the occasional calls by politicians to be 'self-reliant'. But those same politicians do nothing to support them in their productive actions. On the contrary: they are wrongly blamed for breeding mosquitoes in their maize plants and thus contributing to the spread of malaria; thieves are supposed to hide in their fields; they are said to cause soil erosion; to be an 'eyesore', etc. Local councils workers have little mercy on them and quite often come to destroy their crops, develop their fields into building sites without proper notice, or dump debris on them. Some kind of land security is, nevertheless, maintained by the cultivators, informally among themselves. Why is it, after so many years of disregard for these productive initiatives by thousands of Lusaka and Harare residents, that there is still no constructive dialogue between city administrators and associations of small-scale cultivators? The only explanation I can think of is a cultural one: agriculture is regarded as a sign of poverty, especially when it is done by simple means. Those involved in it may be proud among their peers, but are constantly made to feel ashamed by the prestige attached to 'urban' activities like trading, building and office work. As a result they do not organise themselves to present a common front that could enforce a more positive attitude towards them by the city authorities. They also find very little support from local and international Non-Governmental Organisations, who do not regard this activity as sustainable, even though it has sustained itself and the households engaged in it for many decades. This informal gardening also adds to the 'green' atmosphere both cities still have. Lusaka was once (in the 1930s) designed as a 'Garden City' and there is ample reason to maintain this ideal and make it work for rich and poor.

6 West African cases: Jos, Ouagadougou and Bamako

In those West-African cities we have observed in some detail, the attitude among policymakers towards urban food production is slightly more positive than in Lusaka and Harare. Jos is a medium-sized city on the central, high plateau of Nigeria. Because of its relatively mild climate, it is well-known for its good vegetables and potatoes, which are transported over distances of up to 800 km by lorry to the main urban centres along the coast. Bamako and Ouagadougou are the rapidly growing capital cities of Mali and Burkina Faso, respectively.

Apart from the obvious advantage of a concentration of local demand for fresh vegetables in these big cities and the creation of jobs among migrant workers with agricultural skills in situations of economic crisis, the main element of synergy between commercial, small-scale gardening and these cities is the recycling of urban solid waste. The procedure is basically simple:

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drivers of waste disposal lorries are approached by the farmers and paid a small sum for dumping the content of their lorry near their fields. Sometimes there are regular contracts between growers and specific producers of rich, organic waste, but more common is the application of unsorted waste from different neighbourhoods. The growers themselves do some sorting of this waste, either prior to or after on-the-spot composting. Some non-compostable elements like glass, metal and plastics are removed and the rest is either applied directly to the fields or mixed with sand for potted plants.

In Ouagadougou, the same method of enriching the soil is also applied to some rain-fed farming of staple crops (mainly maize and millet) by urban residents on peri-urban land. The effect is astonishing! Barren, crusted soils that were hardly worth the effort of ploughing and planting now once again produce a dense forest of tall and dark green maize plants during the rainy season. The contrast with the adjacent fields to which this compost was not applied is so striking, that it has been proposed to estimate the relevant surface areas by remote sensing techniques. High-resolution images were acquired for the purpose, but so far this approach has not been very fruitful (Kemeling et al. [8]). Substitute indicators, such as the distance to a motorable road, had to be used to arrive at some sort of estimate.

Irrigated horticulture, on the other hand, can be recognised rather easily from the air (see also van den Berg [3b]) from the regularly shaped green patches in dry surroundings. As our research project in Jos indicated, there is an almost unbroken continuum of vegetable production on these fields, ranging from pure home consumption to truly commercial market gardening on a medium to large scale. At the bottom end there are often elderly people, including widows, for whom this activity is "just a way of life". They know it does not provide them with any income, but they just like doing it. Then there are the less successful ones, who are always having problems with their little engine pumps (an essential investment for market gardening in the Jos area) against the more efficient and secure ones, with up to 1 or even 2 hectares. Together they form the small-scale, informal sector, often on borrowed land, but hardly ever with a formal title to it. On the other side of a sharp, institutional and social barrier, there are the vegetable and fruit farms run by real businessmen and companies, sometimes as joint ventures with foreign investors and with more substantial investments than just a motor pump and some irrigation pipes.

The small-scale market gardeners of Jos have organised themselves quite effectively in local associations and an umbrella organisation trying to get a fair deal from local authorities, the ministry of agriculture and the middlemen. One important achievement of this umbrella organisation was that in recent national oil crises, individual growers were no longer required to queue up with their engine pumps at petrol stations to have their containers filled. Instead, after some spectacular protest marches on the town centre they were allowed to collect their rations by jerry can while the pumps could continue to do their work at the farm.

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Laboratory tests of compost heaps, soils and crops of the small-scale market gardeners in Ouagadougou and Bamako have not revealed any potentially dangerous concentrations of poisonous or pathogenic elements. Another characteristic of these producers, especially in Jos, is that chemical fertilisers and pesticides are too expensive for them, if they are at all available on the market. They apply organic farming by default and are very skilled at it. Although everything is run on a shoestring, a low-profile type of extension work exists, including association members visiting each other's farms to learn new techniques. At the same time, the official extension staff is 'too busy' to assist these producers. The crude application of unsorted urban waste is not considered much of a problem by the growers themselves, but outside environmentalists are quite concerned. In Bamako we saw some successful examples of producers improving their composting techniques, but the high-quality products of small sorting and composting units run by urban neighbourhood groups are still too expensive as an input for market gardeners. This compost can so far only be marketed to hotels, embassies and private people with large leisure gardens.

In Bamako we also found another positive effect of growers presenting a united front. When a productive concentration of growers was displaced by a new residential area that had to be built quickly to accommodate the Africa Soccer Cup delegations, they were offered an alternative site to continue their operations. This first-ever sign of recognition I came across in African cities could be the beginning of successful public-private partnerships for horticulture resembling the agro-industrial greenhouse complex found in the famous Westland area of the Netherlands.

Some commercial growers in the centre of Ouagodougou are facing a serious environmental problem. They 'enjoy' an ironic 'privilege', in that their irrigation water is 'enriched' by effluents from the central hospital of that city. Although scientific analysis of test results has proved a correlation between health problems among theses growers and their contacts with polluted water, they do not accept these results and blame their problems on outside forces. Nevertheless, they are at the same time gradually shifting their farming system from vegetables to ornamental plants, having obviously got the message that consumers shunned their lettuce, cabbage and other food crops. And they are too exposed, right at the centre of town, to be able to sell their crops anonymously.

7 A case in Asia: Hanoi

Hanoi has a similar problem with the use of polluted irrigation water and a possible shift from vegetables to ornamentals. However, some urban ecological processes run counter to the most likely solution. In developmental terms, this rapidly growing capital city presents a clear difference between the upstream and downstream areas. Upstream along the Red River, the better-off residents, embassies and offices have established building sites in pleasant rural surroundings, where villagers had already been growing flowers and ornamental plants for many decades. This led to a

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positive feedback loop: because there were many rich people around, more villagers took up flower production and because the area became well-known for its 'flower villages', more well-to-do people wanted to settle there. The area is clean and would be perfectly suitable for vegetable production. By contrast, downstream along the Red River, or near smaller rivers that run through the city before joining the Red River, there are several industrial sites, which add their effluents to the water that is already polluted by urban sewage. This same water arrives at one of the main vegetable producing areas of Hanoi. The local authorities and the co-operatives in this area are generally quite careful in their use of this water. They have created settling ponds where pollutants sink to the bottom, before the clear top water layer is allowed into the irrigation channels. But the system breaks down easily, as capitalism develops and rural-urban solidarity deteriorates as a result of rapidly increasing wealth among the urban population in particular. Some farmers have become rather cynical: "Yes I know these vegetables are polluted (by dirty water or by incorrectly applied pesticides), but I don't care because those urban consumers are too rich anyway and are not showing us any respect". Although some ornamental plants are also grown in the downstream districts, it would be very sensible to concentrate all of it in this area and have the vegetables shifted to the cleaner upstream suburbs. Because it is to a large extent a matter of special skills, linked to people who like the part of town where they live, such a shift is very unlikely to take place. The only alternative is for the city authorities to improve the sewage treatment system, so that downstream producers can benefit form the nutrients carried by the water to their plants without receiving pollutants at the same time.

Two further special features of the Hanoi case need to be discussed in the context of this paper (see also van den Berg [3c]). One is that all farmers whose land is requisitioned for construction purposes are being decently compensated, unlike in most African cases. Nevertheless, this compensation does not really work out the way it is intended. These farmers are expected to find new jobs in the urban economy and part of their compensation is intended for training to increase their opportunities. Most compensation is given to them in cash, which many cannot cope with: they spend for consumables what should have gone into investments. Too many end up destitute. The idea of compensating those who want to continue their specialised horticultural production in the form of alternative land rather than in cash has not yet caught up among the stakeholders in and around Hanoi. And vegetable production is not considered an amenity urban residents like to look at from their balconies. It is apparently too much associated with bad odours from pig manure and with the spraying of poisonous pesticides. It is therefore unlikely that intensive vegetable production will be accepted as a 'green wedge' in the suburban areas of Hanoi, until alternative production methods or crops are introduced that are more visually attractive.

The other more or less complementary feature concerns fish farming in peri-urban and urban Hanoi, and in its downstream districts in particular. The growth of the city has meant that more land in the area is being turned into

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hard surface every year. This results in sharper peaks in the discharges of rainwater. The result of these higher and sharper peaks is that the rice fields downstream are more liable to flooding than before. The farmers affected tend to replace one of their rice crops by a fish crop in order to turn this annual danger into an asset. Then, as the town continues to expand in their direction, the lowest rice producing sections will be turned into more permanent fish farms. The village co-operatives arrange this by tendering these consolidated fields to aspiring fish farmers who are willing to rent the 'ponds' for a period of three to four years. After that they will be tendered again or returned to farming or put to some other use. When the city has expanded virtually to the edge of such fish ponds, the urban development agency tends to use this moment of re-tendering to make an attractive offer to the co-operative members whose fields are at the bottom of this pond. In the process of establishing the level of compensation, this is conveniently regarded as 'unimproved land': no drainage ditches, perennial crops, etc. Developing these low-lying areas would be easy for the agency by bringing in sand from the Red River bed by lorry. Thus, the peri-urban fish farmers play a facilitating role in the process of urban growth. Many fish farms have gone through these stages. When we look at the town plan of Hanoi more closely we see very little room for land-based agricultural production within the built-up area. The only available strips are along the canals and rivers running through the town, sometimes next to a railway line and quite often around former villages that have been completely engulfed by the city (includsing the 'flower villages' mentioned above!). The most significant category of urban open space in Hanoi is made up by lakes, which were formerly either settling ponds or fish ponds. The lakeshores are developed into recreational strips and the lakes themselves are used for boating, fishing and (once clean enough) for swimming.

8 Strategies for supported and sustainable urban agriculture

As the brief case descriptions above show, the co-existence of urbanisation and agricultural production is a complex one. Nowhere is the scope for synergy fully utilised, but cities in Europe and Latin America have generally achieved more in this respect than those in Africa and South-East Asia. Major differences remain within and between continents, countries and even individual cities. Opportunities for synergy are often discovered in 'bottom-up' processes, and are exploited to the extent that such initiatives can continue under their own steam. In the 'top-down' direction, by contrast, the areas of risk and conflict dominate the decision making. In reality, there are various forms of 'toleration', which do not lead to structural solutions for these risks and dangers and can at any given moment of crisis or scandal lead to very abrupt government interference and destruction of crops. How can this non-constructive stalemate be broken?

As Dubbeling [6] pointed out at a recent e-mail conference, it needs a long and well-planned process to bring about a facilitating policy and planning

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framework for urban horticulture. In her opinion, this process involves the following five phases:

Table 4 Main phases in developing a facilitating policy and planning framework (after Dubbeling [6])

Phases	Activities/strategies	Outcomes
1: awareness raising and lobbying	-Preparing systematic, focused information -Issue and city profiling -Raising awareness and understanding -Identifying and mobilising stakeholders -Facilitating dialogue -Forging partnerships and organising core consultative groups	*Fact-sheets, involvement of relevant partners, consensus on key issues leading to framework agreement*
2: diagnosis and stakeholder commitment	-Building on profiling and other information -Preparing focused and systematic overviews -Generating enthusiasm among and co-operation between stakeholders -Building collaboration and consensus -Formulating agreements on priority issues and concrete responsibilities of the various actors involved, including institutional mechanisms and operational activities -Formalising agreements and responsibilities defined through inter-actor agreements	*Focused base-line information, formal political and stakeholder commitment, strategy outlines, agreement on specific steps to be taken next*
3: strategy formulation and action planning	-Clarifying issues -Identifying, elaborating and evaluating general strategies and translating them into actor- or issue-specific and time-bound targets and commitments with results that can be monitored -Negotiating and reconciling action plans -Confirming strategies and plans (issue oriented or actor oriented) - Formal adoption of action plans	*Agreed strategy frameworks, negotiated detailed action plans, formal approval*
4: Implementation	-Designing and implementing demonstration projects -Policy formulation -Integrating projects and plans with strategic approaches -Developing new financial tools	*Demonstration projects, policy formulation, new financial tools*
5: Follow-up and consolidation, institutiona-lisation and anchoring	-Developing and maintaining a monitoring process to ensure information about progress in implementation -Using evaluation to capture experiential lessons -On the basis of the lessons, beginning to replicate and increase the scale of activities -Continuing with activities designed to build / embed the process in city institutions and among stakeholders	*Continuous monitoring of process and results, evaluation of outcomes, feedback and adjustment, replication and increasing the scale of interventions, institutionalisation of the process*

Although phrased in very general terms, this promises to be a very practical guideline for anyone who wants to promote the acceptance and embedding of

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urban farming into normal urban land use planning. Dubbeling bases this scheme on extensive advocacy planning experience in Latin America and careful scrutiny of case studies from other parts of the world. But urban agriculture is not just one entity: it ranges from production in buildings to that in the open air, from rooftops to cellars, and from subsidiary gardens for household consumption via educational experience to small-scale or large-scale market gardening. We should also realise that policies towards URBAN agriculture, including those dealing with health and other risks and problems, are quite different from those for PERI-urban agriculture. It seems that in terms of potential contributions to urban amenity, the urban and peri-urban market gardens and subsidiary gardens in Africa stand a better chance than those in South-East Asia. There is a strong tradition of organic farming among the African growers, not so much out of principle but purely out of necessity: pesticides and chemical fertilisers are just too expensive for them. Could they not keep this up and set a good example?

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