

The Dynamics of Urban Agriculture in Hanoi, Vietnam

B. Lee¹, T. Binns¹, and A. B. Dixon²

¹Department of Geography, University of Otago, New Zealand

²Institute of Science and the Environment, University of Worcester, UK

Abstract. In many developing countries, urban agriculture makes a significant contribution to the livelihoods of urban populations, in providing food security and income generation. In Hanoi, Vietnam's capital city, urban agriculture is a longstanding feature, but rapid urban growth is leading to greater competition over land use, such that this practice is being increasingly threatened by conversion to non-agricultural urban uses. The quality and safety of foodstuffs grown in urban areas is of growing concern to both consumers and producers in developing country cities such as Hanoi, where a large share of the city's food supply is grown within the urban area. Government support has encouraged urban producers to modernize and invest in safer growing practices. However, in Hanoi, as indeed elsewhere, there is an urgent need to recognise the significance of urban agriculture in future planning strategies. Drawing upon recent field-based research in Hanoi, which examined local actors' knowledge and perceptions of changes in urban agriculture within the city, the paper identifies key trends and underlying environmental and socio-economic factors, and considers the future sustainability of the practice.

Keywords. Urban agriculture, Hanoi, Vietnam, vegetables, land-use competition.

1 Introduction

In recent years, considerable interest has been shown in the practice of urban agriculture (UA) as poverty and malnutrition have become widespread in the cities of many developing countries. With increasing numbers of rural poor migrating to cities, more urban dwellers are being born into impoverished families, and in some cases not-so-poor families are slipping below the poverty line (Mougeot, 1999, Mougeot (ed.), 2005). Numerous studies have shown that UA can play a key role in providing valuable food security and income generation among urban households (The Urban Poor, 2005; Egziabher *et al.*, 1994; Lynch *et al.*, 2001).

The considerable spatial and temporal variability of UA makes the concept difficult to define precisely. Taken literally, the practice of UA means: "to establish and perform an agricultural practice in or near an urban or city-like setting" (Mougeot, 2000, p.3). But, according to Mougeot, this definition does not adequately encapsulate the broad and complex variables that comprise UA, and he suggests that;

"Urban agriculture is an industry located within (intra-urban) or on the fringe (peri-urban) of a town, an urban centre, a city or metropolis, which grows or raises, processes and distributes a diversity of food and non-food products, (re-) using mainly human and material resources, inputs and services found in and around that urban area, and in turn supplying human and material resources, outputs and services largely to that urban area" (Mougeot, 1999 p.8).

The international importance of UA is well illustrated by the fact that more than 15 percent of all agricultural production originates from within metropolitan areas (Smit *et al.*, 1996). Moreover, Lynch (2002) suggests that in some cities, UA may already occupy 35 percent of the land area, may employ 36 percent of the population, and may supply up to 50 percent of urban fresh vegetables. As rapid urbanisation across the developing world increases the need to feed urban populations, there is evidence that UA plays a key role in the livelihood strategies of poor and not-so-poor households. As Binns and Fereday (1996) suggest, urban farming is responsible for lifting hundreds of millions of people out of poverty and improving nutrition and health standards around the world. Despite this growing significance, UA remains largely overlooked by urban planners, policy makers, administrators and urbanisation theorists.

UA in the Vietnamese capital city of Hanoi is the focus of this paper. Hanoi, and indeed Vietnam as a whole, have experienced considerable change and development in the last twenty years (Horen, 2005).

The field-based research, which forms the basis of this paper, has three key objectives;

1. To identify spatial and temporal changes in UA in Hanoi.
2. To examine the main factors affecting change in UA in Hanoi.
3. To assess the implications of these changes in the context of the future sustainability of UA in Hanoi.

Further details of the methodology used in the research will be examined later in the paper.

2 The Significance of Urban Agriculture

Much has been written about the various ways in which UA can contribute to food security and livelihood sustainability among the world's impoverished urban population. Urban subsistence production can lead to an immediate reduction in hunger and an improvement in nutrition (Bryld, 2003). In Mwanza, Tanzania, even the wealthier household heads face income insecurity and often plant crops to ensure family food security during lean times (Flynn, 2001).

Critically, UA can be seen as a form of empowerment for underprivileged people, in that it affords poor people an opportunity to increase control over their own nutritional intake. This can be particularly significant for women, who may have traditionally been excluded from food production activities. This is illustrated by a study undertaken in Harare, Zimbabwe (Mbiba, 2005), which found that women produced 60 percent of urban food production, the majority of which was consumed by household members. Bryld (2003), however, suggests that an increase in UA in some cities may have actually amplified the burden on women, in becoming a low-income trap that imprisons unskilled women. The important issue of the role of women in UA has been explored in considerable detail elsewhere (Hovorka, de Zeeuw and Njenga, (eds.), 2009).

A further positive effect of UA is that urban food prices generally decrease when food supplies increase, thus raising the level of disposable income that poor families can spend on other necessities, such as education and healthcare (Urban Agriculture Network, 1996). In terms of environmental impact, UA frequently incorporates practices which can lead to productive, reusable, self-contained waste and nutrient cycles, contributing towards the development of safe and non-polluting environments. Although critics of UA claim that it is often a cause of disease, pest problems, noise, and pollution, evidence has shown that with proper planning and management, UA can actually be a very effective and safe means of producing food (Lock & Veenhuizen, 2001).

UA can have a positive impact on waste management in cities, since both solid and liquid waste, if properly treated, can be applied to crops safely. Urban populations generate vast quantities of waste that is deposited in landfill sites, watercourses and is often spread indiscriminately around the city. In developing countries, waste management is a particularly important issue, since there is frequently insufficient funding and expertise to establish effective management systems (Urban Agriculture Network, 1996). The application of waste to urban crops can make a significant impact in easing the burden on existing waste disposal systems. Plants can also help to purify wastewater, by extracting nutrients such as nitrogen and phosphorous (Urban Agriculture Network, 1996; Toze, 2005).

UA can also have an impact on energy use, which is a major element in the drive to achieving more sustainable cities. Cultivating produce in close proximity to areas of consumption can result in significant energy savings, by reducing energy expenditure on refrigeration, transport and storage. Furthermore, with markets close by, urban farmers can adjust their production strategies to meet changing market demands

and to supply high-value and perishable items. UA can also have a multiplier effect, in generating industrial activity associated with agricultural inputs, storage, transportation, marketing and food processing. In countries that export a large proportion of their agricultural output to earn foreign exchange, it is suggested that UA can help to feed the cities, whilst rural farmers concentrate on export production (Urban Agriculture Network, 1996).

There are also various health concerns associated with UA, which is frequently affected by untreated waste and other pollutants that are discharged directly into water courses, onto land, or into the air. The contamination of soils and water courses can lead to dangerously high heavy metal and toxin levels in agricultural produce. Maconachie and Binns (2006) consider the case of Kano, northern Nigeria, where they identified a serious environmental and health risk from high levels of toxins being discharged into water courses from tanneries and factories (see also Binns *et al.*, 2003). Air pollution also has the potential to reduce both the yield and nutritional quality of crops. In many cases, UA is practiced close to roads, where exhaust fumes and runoff from roads can contaminate crops (Agrawal *et al.*, 2003). This problem can be reduced by planting pollution resistant plants alongside roads and close to other air pollutant sources. However, the planning and infrastructure to make this happen does not exist in most countries (Agrawal *et al.*, 2003).

Egziabher *et al.* (1994) express concern that despite the crucial role that UA plays in contributing to household income and food security, urban planners and administrators have largely ignored UA. Furthermore, government officials, city planners and policy makers frequently perceive UA as a marginal activity that does not belong in modern cities (Egziabher *et al.*, 1994). The common perception in many African and Latin American countries, is that UA is marginal, temporary and archaic, a practice which is actually harmful to consumers, farmers, the environment, the urban land economy and the city's appearance (Urban Agriculture Network, 1996). There are cases of urban farmers' crops being slashed or burned on the orders of the city authorities, who cite issues such as negative aesthetics, and risk of increased pollution and illness as reasons why urban farming should not be tolerated (Egziabher *et al.*, 1994). In Lusaka, Zambia, for example, official policy until the 1980s was antagonistic towards urban farming, such that city authorities regularly slashed urban crops, a practice which occurs in many African countries (Lynch *et al.*, 2001; Simatele and Binns, 2008; Urban Agriculture Network, 1996). For these reasons, UA has failed to reach its full potential because people are concerned about security of tenure and threats to their growing crops.

We will now consider the changing nature of UA in Hanoi, Vietnam, drawing upon evidence from recent field-based research.

3 The Case of Hanoi, Vietnam

Hanoi, Vietnam's capital city, is located in the north of the country, approximately 300 kms south of the Chinese border and 150 kms west of the Vietnamese coastline (Figure 1).



Figure 1. Location of Hanoi

The city is one of the oldest capitals in South East Asia, and in 2010 will celebrate its 1000th year of existence. Its rich, and at times turbulent, history has seen a number of different ruling dynasties and much conflict (Boudarel and Ky, 2002). Hanoi was under Chinese rule from the 1st century BC through to the 10th century AD, followed by approximately eight centuries of Vietnamese rule, which ended in 1874 when the French captured the city. When the French were defeated in 1954, Hanoi returned to Vietnamese rule, but self-rule was again threatened during the American War, which was waged from 1954 until the Americans were finally defeated in 1975.

In 2005, the city had an estimated population of 3.1 million people. Population growth over the last 20 years has been significant, and in-migration from rural areas is continuing to swell the burgeoning urban population, such that between 1996-2001, the city's population grew by 3.2 percent (Vien *et al.*, 2005). The city now covers an area of over 900 square kilometres, with population densities in some parts reaching 35,000 persons per square kilometre. Hanoi's rapidly increasing population has given rise to concerns about the provision of food, and how food security might be achieved in a sustainable manner without jeopardising environmental resources (Van Den Berg *et al.*, 2003). The Hanoi General Master Plan, formulated in 1998, is intended to facilitate further

urban growth by supporting the development of the city's economy, such that it becomes competitive with other major Asian cities (Horen, 2005).

4 Investigating Urban Agriculture in Hanoi

To understand the present nature of UA in Hanoi, it is important to understand the forces that have shaped it over time. Hanoi has been under communist rule since the defeat of the French in 1954. During the American War, farmers were required to grow whatever the government demanded in order to maintain the war effort. After the war, and until the Doi Moi ('renovation') reforms of 1986, farmers were told what produce to grow and they worked collectively on government-run farms. The Doi Moi reforms represented a significant shift in the Vietnamese government's thinking, and involved severing the longstanding relationship with the USSR and developing links with Western countries through opening the country to foreign investment and private ownership. Other new policies included the abolition of price subsidies, the privatisation of some state enterprises and encouragement given to the growth of the market-based economy (Horen, 2005). The most notable effect of the Doi Moi reforms on the agricultural sector was that producers could now work on their individual plots, growing crops of their choice and selling them where they chose. These policy changes transformed the nature of UA in Hanoi, with many people experimenting with different crop types and investing in a range of new production strategies (Vien *et al.*, 2005).

The key objectives of the research on which this paper is based, were to identify the recent spatial and temporal changes in urban agriculture in Hanoi, the factors affecting these changes, and the implications of these changes for the future sustainability of urban agriculture in the city. Field-based research was undertaken during an eight-week period in January and February 2006. The first part of the fieldwork involved scoping the agriculture that exists in and around the urban area. Some fifteen sites were located by questioning key informants and residents, and by visiting different localities and plotting production areas on a map. These initial visits suggested that areas of cultivation were a very prominent feature of Hanoi's urban structure. With the aid of a translator, exploratory discussions were conducted at each site, seeking to identify farmers' perceptions of the key issues influencing UA.

From the information gained through scoping, three contrasting villages, deemed representative of UA in Hanoi, were subsequently selected for detailed investigation. Figure 2 shows the location of the three selected study sites in relation to the main features of Hanoi.

Site 1 is Quang An village in Tay Ho District. Tay Ho is an urban district, and Quang An is situated at the centre of a traditional flower growing area, with areas of ornamental plants and trees and only a small area of vegetable cultivation. Of the three selected sites, production in Quang An has probably been affected most by the pace and extent of urbanisation, with respondents reporting that the extent of the agricultural area is now less than a third of what it was fifteen years ago.

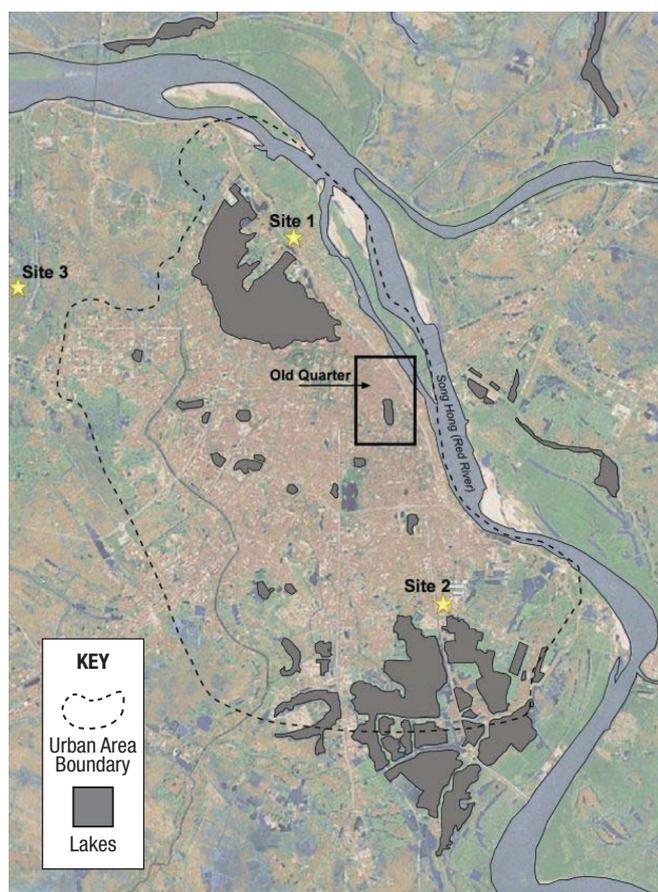


Figure 2. Hanoi, showing location of study sites

Site 2 is Linh Nam village in Hoang Mai District. Hoang Mai is a new urban district, only designated in 2003 as a result of merging an existing urban district with a portion of a rural district. Linh Nam is a traditional vegetable growing area which has benefited from government initiatives and associated funding for so-called ‘safe’ vegetable growing. Safe vegetables are located away from possible sources of pollution and are irrigated only with clean water. Limited amounts of chemical fertiliser and pesticide are applied and composted animal manure is used wherever possible. In early 2006, Linh Nam’s agricultural land seemed reasonably secure, at least for the foreseeable future.

Ve village in Tu Liem District was the third site examined. Tu Liem is a peri-urban district that is experiencing increasing urban pressure, and is expected to become an urban district within the next five to ten years. In fact, most of Ve village’s agricultural land is designated to be appropriated by the government for construction purposes, although there is some uncertainty about when this will actually occur. Rice growing traditionally predominated in Ve village, along with significant areas of water spinach cultivation (*ipomoea aquatica*). However, the situation has changed in the last 3-4 years, such that many farmers are now growing flowers, ornamental trees and shrubs.

Twenty-one farmers were interviewed at each of the three sites, during which they were asked a range of questions relating to changes in their livelihoods, urban farming and marketing practices, and their relationships with local authorities. Through the People’s Committee in each District, meetings

were also held with the leaders of the cooperatives in each village. These in-depth meetings, which included the use of participatory methods such as timelines and seasonal maps, explored the history and issues surrounding agriculture in each village. In addition to discussions with farmers and cooperative leaders in the three villages, discussions were also held with an additional twenty-three key informants, including academics, NGO workers, and those working in government programmes and departments associated with UA.

5 The Changing Nature of Urban Agriculture in Hanoi

The field research data highlighted significant changes in the way UA has been practiced in recent years. Almost one third of the farmers surveyed said they had changed their type of production in some way over the last ten years. Many key informants also spoke about production changes, and one senior lecturer from Hanoi Agricultural University’s (HAU) Faculty of Agronomy explained that as the city expands, farmers as far out as the urban fringe have altered their production from staple crops, such as rice, maize and sweet potato, to vegetables and subsequently flowers and ornamental plants. Flowers and ornamental plants, shrubs and trees fetch the highest prices in Hanoi markets. A number of key informants pointed out that there is a natural progression in UA as urban expansion causes ever-increasing land prices, with farmers changing successively from the production of staples, to vegetables and then to higher value products such as flowers, plants, shrubs and trees.

Clearly, many farmers were benefiting from these trends, and every farmer interviewed reported that their family was better off now than ten years ago. The profitability of urban farming is a positive indicator of the state of UA in Hanoi, and many farmers explained that they had built new houses, bought new vehicles and/or reinvested in agriculture with their higher earnings from UA.

Despite the overall shift from vegetable to flower and ornamental production, a significant number of farmers commented that in recent years they had started to grow vegetables specifically for their families, thereby ensuring the vegetables they eat are ‘safe’. Farmers were genuinely concerned about the effects of dangerous chemicals in fertilisers and pesticides, as well as problems associated with the use of polluted water on crops. This concern is supported by Moustier *et al.*, (2005) who state that:

“Although consumption of vegetables has increased considerably over the past ten years, they are also the products which give consumers the most reason for concern in terms of the health risk they present. A survey of 200 households in Hanoi in 2002 demonstrated that half of them considered that the quality of food-stuffs has fallen during the past ten years” (Moustier *et al.*, 2005 p.2).

Key informants’ concerns about the effects of pollution are in line with the problems associated with city waste and UA identified by among others, for example, Agrawal *et al* (2003) in Varanasi, Binns *et al* (2003) in Kano, and Mapanda (2007)

in Harare. The coordinator of the SUSPER project in Hanoi (Sustainable Development of Urban Agriculture in South East Asia) commented that, “wastewater is a big problem, because with urbanisation polluted water will become more prominent” (respondent KI#23).

One response is that the government is actively encouraging farmers to move to ‘safe’ vegetable production. Linh Nam village meets the criteria for the cultivation of safe vegetables, being far from any pollution associated with roads and industry. For these reasons, the vice-head of Linh Nam commented that his village was chosen to receive government subsidies for the installation of safe vegetable infrastructure. The government had paid for a well to be dug to extract unpolluted water, and farmers who were willing to pay half the cost of protective nets for their crops could do so, with the other half of the costs being paid by the government. A number of vegetable farmers in other villages expressed an interest in converting to safe vegetables with similar government assistance. A senior lecturer from HAU’s Faculty of Agronomy, confirmed the growing significance of safe vegetables, commenting that, “...the government wants people to produce more and more safe vegetables” (KI#12). This drive towards more safe vegetable production is a significant recent development in Hanoi’s UA, although, as Van Hoi *et al* (2009) point out, this has met with relatively limited success to date, due to insufficient investment in safe vegetable marketing, and a lack of trust on the part of consumers.

The level of control that the government and village cooperatives have over villages and farmers has changed immensely over the last twenty years and is continuing to change. Timelines, which were drawn by leaders of the three village cooperatives, identified three distinct periods since 1975, each associated with different levels of control and influence by the government and cooperatives (Figure 3).

In 1975, all Vietnamese farmers worked the land collectively to produce whatever outputs the government demanded. The Doi Moi reforms in 1986 brought greater freedom, since when farmers have been given the right to farm plots of land individually and to decide what to grow. However, farmers had to give a proportion of their produce to the cooperative, and in most areas the cooperative still marketed the produce for them. This level of influence continued until the mid-1990s, when many cooperatives began to have less influence and farmers could decide themselves on how and where

to sell their produce. Of the three village cooperatives studied, only one still had any involvement in the supply of farm inputs, processing and marketing.

With the increasing individualisation of farming and the widespread withdrawal of cooperatives from production and marketing, the nature of UA in Hanoi has become much more complex. Farmers now generally purchase their own farm inputs and take their production to market. Whilst the freedom of decision-making in relation to the production and marketing of UA produce is in many ways a positive trend which is broadly welcomed by farmers, this has led to thousands of extra vehicle journeys a day, with associated increases in traffic congestion, pollution and time spent on transporting and selling produce. It is likely, therefore, that the increased costs associated with labour and transport could affect the long-term economic sustainability of UA for small producers, as has evidently been the case in other Asian cities (Midmore and Jansen, 2003).

5.1 Factors Affecting the Changing Nature of UA in Hanoi

The main factor influencing the changes occurring in UA in Hanoi is undoubtedly the rapid growth of the city since 1975. Furthermore, since the Doi Moi reforms of 1986 the economy has been steadily opened up to foreign exchange, foreign investment and tourism. The liberalisation of the Vietnamese economy, and its opening up to global markets, has led to the rapid development and physical growth of Hanoi, which has inevitably increased the demand for land for commercial and industrial purposes, thereby threatening urban agriculture. Indeed, this has been the experience of many other cities (Vagneron, 2007; Midmore and Jansen, 2003), not least as a result of insecurity of land tenure (Lynch *et al*, 2001; Asomani-Boateng, 2002). Whilst the consequences of land use pressure have ranged from the forcible ejection of tenant farmers in some cities, to land-secure farmers creating cooperative groups to pool their resources in others (Mougeot, 2005), in Hanoi it seems that co-operatives are becoming less influential. Moreover, individualisation has allowed diversification in agricultural production and a notable shift towards higher yielding and more valuable market-orientated crops.

A socio-economist working in Hanoi for MALLICA (Markets and Agricultural Linkages for Cities in Asia) and

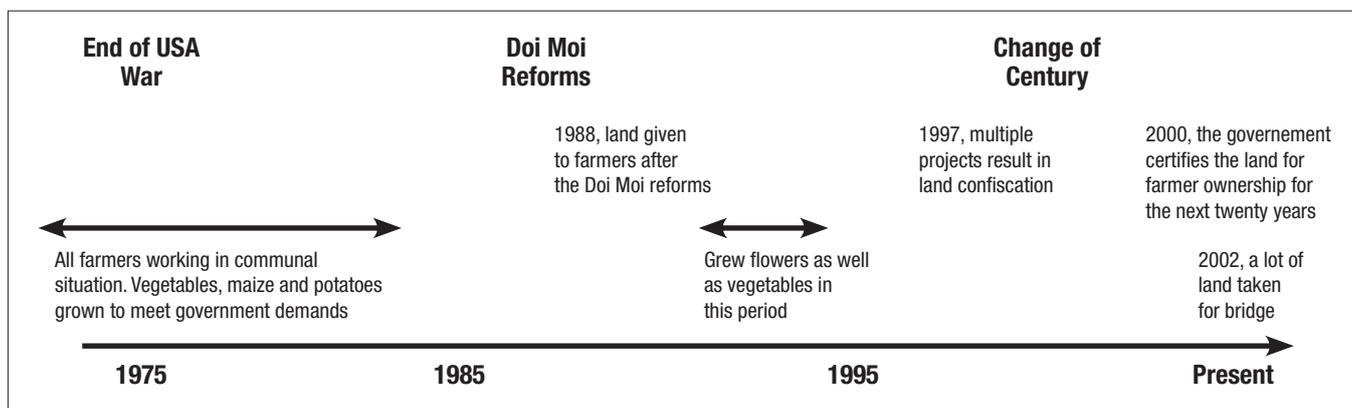


Figure 3. Timeline of events relating to urban agriculture in Hanoi

CIRAD (*Centre de Cooperation Internationale en Recherche Agronomique pour le Developpement*), when asked about changes in production, commented:

“The municipality wants to give the city a modern image. There can still be agriculture in the city, but it has to be modern now, safe vegetables for example. Rice for example, does not give a modern image of the city. This is why rice and water spinach etc. are not as prominent any more as flowers and ornamentals” (KI#4).

A project officer from MARD (Department of Agricultural and Rural Development) confirmed the government’s objectives thus:

“The government has a policy to reduce the area of rice production close to city - rice covers about forty percent of agricultural land around Hanoi. The government is trying to reduce maize and other staple crops, and is trying to develop higher value crops” (KI#19).

These comments indicate that, as in many other cities worldwide, and as considered by Egziabher *et al.* (1994), the government wants Hanoi to fit the modern image of a city and therefore only encourages ‘modern types of agriculture’. As the city expands and progressively takes over more land on the urban periphery, land used for growing rice is often the first to be taken. Farmers recognise this and are converting to production that is considered more modern, such as safe vegetables, flowers or ornamental plants. This process is further strengthened in that when the government takes over farm land, the level of compensation is based on the actual value that the land gives to the farmer in its present state. This policy was confirmed by the coordinator of the SEARYSN (South-East Asian Rural Urban Synergy) program:

“Farmers are often not afraid to invest in their crops, because a farmer with peach trees or bonsai will receive more compensation than a rice farmer will receive, although other factors such as location affect compensation also” (KI#6).

The practice regarding compensation is very different than, for example, in Lusaka, Zambia, where farmers show considerable reluctance to invest in their farm plots because of the significant risks involved (Urban Agriculture Network, 1996). In Hanoi, farmers have had more incentives (or at least fewer deterrents) to invest in their land, which has led to changing production strategies and greater investment in farm infrastructure. The vice-head of Quang An Village, when asked if farmers were less likely to invest in their land due to the risk of urban expansion, replied: “Yes, they are afraid that if they do not invest a lot of money they will lose their land” (KI#1).

5.2 The Implications of Changes in Urban Agriculture

The implications of these changes in UA in Hanoi are significant, most notably in that large numbers of urban farmers are losing their livelihoods as land is progressively taken over for urbanisation. Although a few farmers reported that they were able to hire new land to continue farming, every cooperative

leader spoke of farmers who had lost their land. Although farmers were paid compensation, they lost their livelihood, and once the compensation was spent it seems that many struggled to make ends meet. A professor from the Institute of Sociology remarked: “When land is taken, in the short-term people get money from compensation, but in the long-term they have no plans” (KI#10). Farmers themselves spoke passionately about their fears over the threat of urbanisation; ‘we are afraid because then we will be jobless’, was a common perspective. In addition to paying compensation, the government provides re-training for farmers who have had their land taken. The head of Linh Nam village explained that:

“If the government takes the land here, then the farmer will have to find another job. If they cannot, they often send the compensation money to the bank and try to live off the interest. But the compensation of the government also includes money to educate the person so they can have the skills to find another job” (KI#2A).

Some respondents pointed out that younger farmers may actually benefit from losing land to urbanisation, because they will receive money and training and they are young enough to utilise these to further their careers. But there was also much concern about older farmers being unable to use the training effectively, and that losing their land could well have a major impact on their livelihoods.

The implications of less government control over urban farming are numerous and can already be seen in Hanoi. Farmers now pay less tax to village cooperatives than in the past, and some pay none at all. An additional implication of higher incomes for farmers is that they have been able to invest in better infrastructure and in making the transition to higher value crops. This is indicated in the high percentage of farmers who said they had transformed their land to enable them to grow higher value crops. While less government control has generally had positive implications, there are some negative implications for the sustainability of urban farming. The director of the IPM (Integrated Pest Management) programme, for example, spoke about a specific difficulty for farmers as an implication of less government control:

“When policy changes and farmers decide their own production, it is very difficult for the farmer. Because they don’t have much chance to contact the Government officials, they don’t know which pesticides are good. They use too much pesticide” (KI#8).

Programs such as IPM, along with many NGO initiatives, are working to fill the gap caused by the loss of government advice, and are providing support in areas such as fertiliser and pesticide use, about which there is much concern.

Changes in production types have had both negative and positive implications. On the positive side, farmers who have changed to higher value crops now perceive themselves to be much better off. Many respondents commented that the changes in production were entirely positive. For example,

“The most important thing is more money. Farmers say that if they grow vegetables, then they can get five times more benefit than from growing rice, and flowers are higher again” (KI#6).

“It is a logical way, they will all look to have more income. When income rises it’s always positive” (KI#23).

Meanwhile, other respondents admitted that while production changes were mainly positive, there could also be negative implications. For example,

“This is good because the farmers get more money. However, fertilisers and pesticides cause soil, air and water pollution. Often people use more fertiliser and pesticide on flowers, so this is an issue with changes in production” (KI#5).

Another key informant commented that:

“Urbanisation and the transition from rice to vegetables and to flowers etc, may pose some problems for the small farmers growing rice. It may be hard for people to convert from rice to vegetables” (KI#23).

The increasing trend towards growing safe vegetables has positive implications for the future environmental sustainability of urban agriculture in Hanoi. With increasing pollution and use of chemical inputs in many cultivated areas, safe vegetables represent a shift in the other direction, towards a more conscientious management of the environment and a greater regard for human health and well-being.

6 Conclusion

Field-based research in Hanoi has revealed a series of pressures that could militate against the medium- and long-term sustainability of UA in the city. Not least of these is the need for much clearer planning objectives with regard to the trade-off between the progressive development of the city and the prospects of retaining certain forms of UA. A number of respondents suggested that Hanoi needs a much clearer Master Plan, particularly in relation to UA. As the Director of the SUSPER program commented; “the uncertainty of the Master Plan leads to a not so sustainable form of urban agriculture. There needs to be a clearer Master Plan” (KI#23). Easing the uncertainty expressed by farmers that their land may be taken at some point in the future, would lead to more effective management of plots, because farmers would have greater confidence about investing in their land.

There is also an urgent need for greater coordination in the transportation and marketing of UA produce, which could save time, money and resources. A possible solution would be for the government to increase its influence, for example, by requiring farmers to use trucking companies to transport produce, rather than their own personal cars and motorcycles which congest and pollute central Hanoi.

UA is a longstanding feature in Hanoi, but as the city continues to grow many issues are apparent that could threaten the sustainability of this practice. Farmers and others are well aware of the changes occurring, such that cultivated land which supplies food solely to Hanoi city is gradually being pushed further and further away from the city centre. The cultivated land that remains within the urban area is being squeezed and is under considerable pressure to remain in agricultural use. Farmers have demonstrated a good ability to adapt production strategies in favour of more intensively

grown and higher value crops, because there is a growing market for such crops, and also because the government appears to be more tolerant towards more modern and safer agricultural practices. Increasing demand for products such as flowers and ornamental plants has also accelerated the pace of change within UA. At a time when there is much interest in green and sustainable cities, it seems there is an urgent need for UA to be more fully incorporated into urban planning strategies which are based on grassroots perceptions and aspirations. Failure to do this could lead to the complete loss of UA from Hanoi within the next two or three decades.

The experience of Hanoi could well have lessons for the future of UA in other developing countries. The accelerating rate of urban encroachment, the cultivation of higher value products, and concern about ‘safe’ vegetables among consumers, producers and urban authorities, are trends which can be seen elsewhere to a greater or lesser extent. It may be that Hanoi is just ‘further down the transitional road’ than other cities. If Hanoi’s experience is replicated elsewhere, then it seems that without a clearly designated provision for urban agriculture in the future ‘master plans’ of cities in Africa and Asia, the practice is destined to become a thing of the past. Whether such a process is good or bad should undoubtedly be the subject of further research and debate.

References:

- Afrane, Y.A., Klinkenberg, E., Drechsel, P., Owusu-Daaku, K., Garms, Agrawal, M, Singh, B, Rajput, M, Marshall, F and Bell, J N B (2003) Effect of air pollution on peri-urban agriculture: a case study. *Environmental Pollution* 126, 323-329.
- Asomani-Boateng, R (2002) Urban cultivation in Accra: an examination of the nature, practices, problems, potentials and urban planning implications. *Habitat International* 26, 591–607
- Binns, T. and Fereday, N. (1996) Feeding Africa’s urban poor. *Geography* 81 (4), 20-24.
- Binns, T., Maconachie, R. A. and Tanko, A. I. (2003) Water, land and health in urban and peri-urban food production: The case of Kano, Nigeria. *Land Degradation & Development* 14, 431-444.
- Boudarel, G. and Ky, N. V. (2002) Hanoi, city of the rising dragon, Rowman & Littlefield Publishers, Oxford.
- Bryld, E. (2003) Potentials, problems, and policy implications for urban agriculture in developing countries. *Agriculture and Human Values* 20, 79-86.
- Egziabher, A. G., Lee-Smith, D., Maxwell, D. G., Memon, P. A., Mougeot, L. and Sawio, C. (1994) *Cities Feeding People: An Examination of Urban Agriculture in East Africa*, International Development Research Centre, Ottawa.
- Flynn, K. C. (2001) Urban agriculture in Mwanza, Tanzania. *Africa* 71, 666-690.
- Horen, B. V. (2005) City profile: Hanoi. *Cities* 22 (2), 161-173.
- Hovorka, A., de Zeeuw, H. and Njenga, M. (eds.) (2009) *Women feeding cities*, Practical Action, Rugby.
- Lock, K. and Veenhuizen, C. B. (2001) Balancing the positive and negative health impacts. *Urban Agriculture Magazine*, March 2001.
- Lynch, K. (2002) Urban agriculture. In: Desai, V. and Potter, R. B. (Eds) *The Companion to Development Studies*. Arnold, London, pp 269-272.
- Lynch, K., Binns, T. and Olofin, E. (2001) Urban agriculture under threat: The land security question in Kano, Nigeria. *Cities* 18 (3), 159-171.

- Maconachie, R. A. and Binns, T. (2006) Sustainability under threat? The dynamics of environmental change and food production in peri-urban Kano, Northern Nigeria. *Land Degradation and Development* 17, 159-171.
- Mapanda, F, Mangwayana, E N, Nyamangara, J and Giller, K E (2007) Uptake of heavy metals by vegetables irrigated using wastewater and the subsequent risks in Harare, Zimbabwe. *Physics and Chemistry of the Earth* 32, 1399–1405.
- Mbiba, B. (1995) *Urban Agriculture in Zimbabwe: implications for urban management and poverty*, Avebury: Aldershot.
- Midmore, D J, and Jansen, H G P (2003) Supplying vegetables to Asian cities: is there a case for peri-urban production? *Food Policy* 28, 13–27.
- Mougeot, L. (1999) *Urban Agriculture: Definition, Presence, Potential and Risks, Main Policy Challenges*. Report submitted for presentation at International Workshop on Growing Cities, Growing Food, La Habana, Cuba.
- Mougeot, L. (2000) *Urban Agriculture: Concept and Definition*. *Urban Agriculture Magazine*, July 2000.
- Mougeot, L. J. A. (ed.) (2005) *AGROPOLIS: The Social, Political and Environmental Dimensions of Urban Agriculture*. Earthscan, London.
- Moustier, P., Figuie, M., Loc, N. T. T. and Son, H. T. (2005) The role of coordination in the safe and organic vegetable chains supplying Hanoi. Paper prepared for ISHS July 19-23, 2005, Chiang Mai.
- Simatele, D. M. and Binns, T. (2008) Motivation and marginalization in African urban agriculture: The case of Lusaka, Zambia, *Urban Forum*, 19 (1), 1-21.
- Smit, J. (1996) *Urban Agriculture, Progress and Prospect: 1975-2005*. Report 18, *Cities Feeding People Series*, March 1996, IDRC, Canada.
- The Urban Poor (2005) online: *The Urban Poor*. <http://www.info-forhealth.org/pr/m16/m16chap2.shtml> (accessed 28 April 2006).
- Toze, S. (2005) Reuse of effluent water – benefits and risks. *Agricultural Water Management* 80, 147-159.
- Urban Agriculture Network (1996) *Urban Agriculture: Food, Jobs, Sustainable Cities*, Publication series for Habitat II, Vol.1, New York: United Nations Development Programme.
- Vagneron, I (2007) Economic appraisal of profitability and sustainability of peri-urban agriculture in Bangkok. *Ecological Economics* 61, 516 – 529.
- Van Hoi, P, Mol, A, and Oosterveer, P (2009) Market governance for safe food in developing countries: The case of low-pesticide vegetables in Vietnam. *Journal of Sustainable Management*, 91, 380–388.
- Van Den Berg L. M., Van Wijk, M. S. and Hoi, P. V. (2003) The transformation of agriculture and rural life downstream of Hanoi. *Environment and Urbanization* 15 (1), 35-52.
- Vien, T. D. , Quang, N. V. , Dung, P. T. and Gia, B. T. (2005) *Agricultural production and marketing in peri-urban Hanoi*, SEARUSYN, Hanoi.
- World Atlas (2006) online: <http://worldatlas.com/webimage/country/asia/ciamaps/vn.htm> (accessed 18 May 2006).