



THE GROWTH OF CITIES IN EAST-AFRICA: CONSEQUENCES FOR URBAN FOOD SUPPLY

Paper developed by the RUAF Foundation for the World Bank

This paper was developed with financial support from the World Bank and the European Union

The authors also want to acknowledge the following people who provided information on national and local policies referenced in this paper: Andrew Adam-Bradford, Christine Aubry, Diana Lee-Smith, Dick Foeken and Takawira Mubvami.

Final version, 20 December 2010

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Table of contents

1. Assessing city growth and the consequences for city supply in horticulture products	3
1.1 Urban growth and projected trends	3
1.2. Urbanisation, urban poverty, climate change and urban food insecurity	3
1.3 Strengthening urban food supply	5
2. Assessing national and municipal policies and their constraints and opportunities for (peri-)urban horticulture	7
2.1 Policies in Ethiopia and Addis Ababa	7
2.2 Policies in Kenya, Nairobi and Nakuru	9
2.3 Policies in Madagascar and Antananarivo	11
2.4 Policies in Tanzania and Dar es Salaam	12
2.5 Policies in Uganda and Kampala	15
2.6 Some general messages for policy makers	17
3. A strategy for regional food systems, balancing rural and urban food supply	21
4. Strategies for coordination of support to urban food supply and regional food systems	25
5. Key references for further reading	27
Appendix 1. Benefits and risks of urban and peri-urban food production	28
Appendix 2. Support needs for urban and peri-urban horticulture production and distribution	31
Complete list of references	32

1. Assessing city growth and the consequences for city supply in horticulture products

1.1 Urban growth and projected trends

According to the United Nations, it is predicted that by 2030, the number of city dwellers will reach 60% of the world's population. This urban population growth will be most significant in low income countries, notably in Africa and Asia. Among African countries, and in the foreseeable future, East Africa will experience total and urban population growth rates significantly higher than the African average (UN-HABITAT, 2008). Dar es Salaam, Kampala, Nairobi, Antananarivo and Addis Ababa already rank among the 31 fastest growing cities and urban areas (see Table 1).

Table 1: Fastest growing cities and urban areas (1 to 31)

Rank	City/Urban area	City population (2010)	Metro population (2010)	% of total urban population in the country in 2007	Country	Average annual growth (2006-20), in %
1	Beihai	1,420,000 (2006)	-		China	10.58
2	Ghaziabad	970,000	-		India	5.20
9	Dar es Salaam	2,498,000	2,700,000	29%	Tanzania	4.39
13	Kampala	1,420,000	1,600,000	35.9%	Uganda	4.03
18	Nairobi	3,130,000	3,300,000	37.7%	Kenya	3.87
20	Antananarivo	903,000	1,403,000		Madagascar	3.73
25	Maputo	1,244,000	1,640,000		Mozambique	3.54
31	Addis Ababa	3,385,000	4,568,000	22.5%	Ethiopia	3.40

Source: <http://www.citymayors.com/statistics/>

Although capital cities will continue hosting a large part of the urban population, rapidly changing conditions in smaller urban areas call for even greater consideration. East-African cities with less than 500,000 inhabitants are now absorbing about two-thirds of all urban population growth (UN-HABITAT 2008). Governments need to be better prepared for the coming growth. New ways will have to be found to equip both larger and smaller cities to plan for expansion, use their resources sustainably and deliver essential services.

1.2. Urbanisation, urban poverty, climate change and urban food insecurity

Urban growth combined with limited employment opportunities in cities is leading to a more rapid increase in poverty in urban areas than in rural areas. A massive 43 percent of African's urban populations live below the poverty line. In several Sub-Saharan nations that share even exceeds 50 percent and Africa's urban slum populations continue to grow: 69% of all households in Addis Ababa, 65% in Dar es Salaam and 50% in Kampala and Nairobi are slum households (UN-HABITAT, 2008).

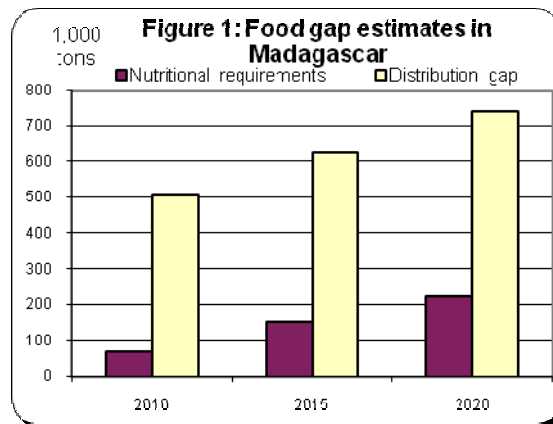
Rapid urban growth and growing urban poverty should raise concerns particularly about African urban food security, supply and distribution systems. The urban poor are particularly **vulnerable to variations in food and fuel prices and in income** since food (often over 60%) and fuel (often more than 10%) make up a large part of their household expenses. Variations in food prices and income directly translate into diminished purchasing power and rising rates of food insecurity, compromising dietary quantity and quality. It is estimated that the rise in food prices between 2007 and 2008 increased the number of people living in extreme poverty in urban areas in East and South Asia, the Middle East and Sub-Saharan Africa (SSA) by at least 1.5% (Baker, 2008). Although prices of food and fuel have declined in the latter half of 2008 and early 2009, they still remain much higher than they were for much of this decade. Though the food security situation in SSA improved from 2009 to 2010, nearly half of the region's population remains food-insecure. By 2020, the number of food insecure people in the region is projected to exceed 500 million (USDA, 2010).

High **dependence on food imports**, especially for lower income countries with limited foreign exchange reserves, means that any increase in import prices or decline in export earnings could force a decline in food imports, causing their food security to deteriorate further, hitting first and foremost the urban poor.

Nowadays, Africa is especially dependent on food imports, as well as on food aid receipts. In 2005-06, in 11 SSA countries, the import share of total grain supplies equalled 45% of consumption, while in 7 countries the import share was in the range of 30-50% (USDA, 2009). This percentage is only projected to increase. In Ethiopia, Kenya, Madagascar, Tanzania and Uganda, imported foods, including basic staples such as grains and vegetable oils, are an important component of (urban) food supplies (see Table 2). Even so, food gap estimates are projected to rise towards 2020 (USDA, 2010) (see Figure 1 for Madagascar, showing similar trends as for Kenya, Tanzania and Uganda).

Table 2: Projected grain imports 2010-2020

Country	Commercial grain imports In 1,000 tons	
	2010	2020
Ethiopia	28	48
Kenya	1,629	1,771
Madagascar	256	276
Tanzania	949	1,624
Uganda	271	439



*The nutritional gap describes the amount of grain equivalent needed to support nutritional standards on a national average level. The distributional gap describes that amount of grain equivalent needed to allow each income quintile to reach the nutritional requirement. Source: USDA (2010), Economic Research Service, using data from FAOSTAT, UN Food and Agriculture Organization and World Food Program, Rome.

Many African governments, such as Ethiopia and Kenya, have placed renewed emphasis on increasing rural agricultural production to resolve their food insecurity problems and also as an engine of growth. However, urban food supply will remain a challenge. Changing rainfall patterns will affect rural agricultural productivity and threaten yields in many developing countries (see also Figure 2). An estimated 65% of the increase in hunger from the effects of climate changes will be in Africa (USDA 2010). African countries not only risk yield reductions; in addition, the share of arable land in tropical regions is expected to decrease. The World Bank's projections are particularly worrisome for Africa, with Eastern Africa losing up to 15% of its cropland area within the next thirty years (Lotsch 2007). Potential food shortages will result in further increasing food prices.

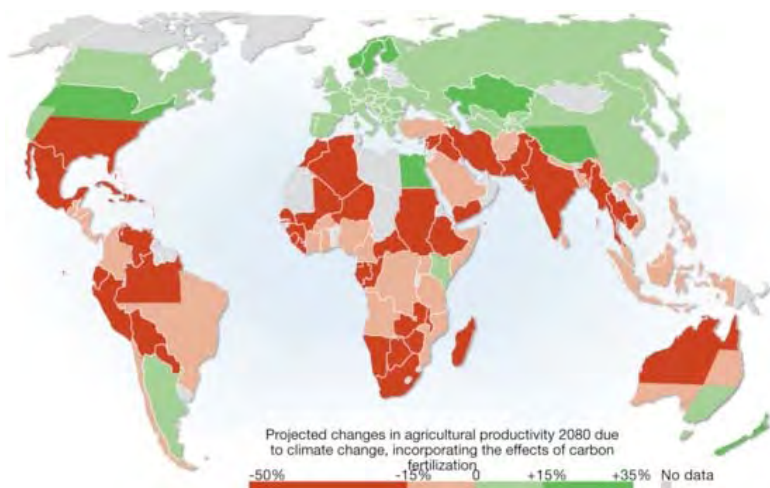


Figure 2: Projected changes in agricultural productivity in 2080 due to climate change
Source: "Environmental Food Crisis" UNEP - 2009

Maxwell *et al.* (2009) argue that with growing urban populations more urban consumers are exposed to the fluctuations in world market prices, and question who will safeguard their food security: *“Economies such as Mozambique’s or Cambodia’s may be growing, but they are not doing so at a rate that sustains buffers for their poorest inhabitants, and the rural- (peri-) urban shift can put many more people in potential harm without a functioning government safety net. This has implications for future humanitarian interventions; is the international community sufficiently able to assess urban needs and able to intervene to protect food insecurity in non-agrarian settings?”* (Maxwell *et al.*, 2009, p. 16).

Furthermore, and with urban expansion, the overall cost of supplying, distributing and accessing food is likely to increase. As distances between food producers and consumers grow, food becomes more expensive (transportation costs assuming a rapidly growing share of food prices; while post-harvest losses are further increased caused by inappropriate handling and packaging). Especially low-income households, residing farther away from food markets, may face higher prices, time constraints and transport costs in accessing food (Argenti and Marocchino, 2005, UN-FAO, 2010).

In addition, development of dependable food infrastructure (production, transport, markets, industry) is not keeping pace with the rapid urban growth. The lack of infrastructure is especially a problem in terms of keeping cities supplied with perishable and fresh produce. Growing demand for processed foods, with lower nutritional qualities, high levels of fat and sugar, may put specifically the poorer sections of society at greater risk from under-nutrition (Ambrose-Oji, 2009) and diet-related chronic diseases. Urban (poor) consumers are in need of access to cheap, micro-nutrient rich foods such as fruits and vegetables. **Promoting healthier food habits, accompanied by strategies to ensure access to horticultural produce by the urban poor are among the challenges.**

1.3 Strengthening urban food supply

Urban food supply and distribution systems can be grouped into two subsystems (Azagrande and Argenti 2001): (1) the “food supply to cities” subsystem that includes all activities required to produce food and bring it to cities: production (including urban food production), imports as well as processing, storage, packaging, transport etc., and (2) the “urban food distribution” subsystem that includes all formal and informal activities required to distribute food within an urban area: whole-sale, retailing, street food, restaurants etc.

Promotion of urban food production should take into account the critical role of equitable access to land and water in sustainable urban development. A particular problem is that urban spatial growth is rapidly converting nearby agricultural areas into non-food producing land uses, threatening economic productivity and urban food supply to a much greater extent than has been recognised in policy circles.

UN-HABITAT (2008) states that: *“Rather than applying crisis management through ad hoc responses, African governments should consider how they can strategically position themselves for changing urban food requirements and the need for supply strategies and systems in the short, medium and longer term so that they will continue to be able to feed their increasingly urban societies. Policies are needed that protect (peri-)urban agricultural land, land rights and agricultural livelihoods of the poor. Solutions can be found in stimulating urban and peri-urban agricultural production; improving infrastructure to facilitate inputs into agriculture and outputs from agriculture to cities; and better water management to convert the non-productive territories of the continent to food production for internal use and future export”* (p. 34).

It is also in this context that the UN High Level Task Force on the global Food Crisis (2008) explicitly recommends that: *“A paradigm shift in design and urban planning is needed that aims at: (.....) Reducing the distance for transporting food by encouraging local food production, where feasible, within city boundaries and especially in immediate surroundings”* (p. 15).

Next to promoting local food production, governments should also look at improving efficiency of low-cost, shorter, more equitable and transparent urban food distributing and marketing systems. Public markets in Sub-Saharan Africa are poorly adapted for fresh vegetables sales as they are characterised by poor infrastructure and in many cases problematic hygiene conditions; and the absence of market information

systems¹ result in weak vertical coordination and inefficiency (e.g. in Kampala backward flows of indigenous vegetables between retailers and wholesalers were detected – Weinberger and Pichop, 2009). Traditional and usually informal food distribution systems continue to play an important role in satisfying specific food needs of poor urban households. These include the handling, storage, transport, processing, packaging, whole sale and retail of fresh or prepared food products. In most cases, women are responsible for such small catering operations and street food. Such informal food distribution facilitates consumer access to food, saving time and transport cost; provide small food portions affordable to the poor; and provides employment and income to involved households. Lack of funds and access to financing however restrict storage capacity of informal traders (a particularly important constraint in the case of perishable horticultural crops), conditions of street sale may give rise to problems of food safety and hygiene and street vending may add to problems of congestions and safety (UN-FAO, 2003).

Also, the impact of the development of supermarkets and restaurants on the characteristics of supply chains needs more attention. 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 farmers can ensure regularity of product supply through farmers' groups, for example). In Kenya, the involvement of supermarkets in the distribution of traditional leafy vegetables has successfully boosted smallholders around Nairobi, and seed companies as well. Traded volumes of traditional vegetables increased from 31 tonnes per month for 3-4 months for a farm gate value of US\$ 6,000 per month, to 600 tonnes per month the whole year round with an estimated value of US\$ 142,860 per month (data cited in Weinberger and Pichop, 2009). This suggests that supporting and promoting farmer organizations and helping them to link directly to supermarket retail outlets can bring benefits both to farmers and consumers. However, many authors have warned that the rising power of supermarkets (and food processing agri-businesses) coupled with the liberalisation of food markets, has driven the consolidation into large-scale farms, with growing levels of indebtedness and characterised by ecological degradation. Supermarkets are expanding rapidly in many developing countries. Ssemwanga (2010) reports that in Kampala there are over 100 supermarkets, and that though they are not yet in a dominant position in regards to fruit and vegetables, their share is growing rapidly. They also exert "immense power" in their relations with suppliers, and there is evidence of concentration taking place as foreign operators seek to have larger networks in the country through mergers and acquisitions.

The challenge of feeding cities consists in facilitating access to food by consumers and creating conditions to ensure investments needed to increase urban food production, food processing and distribution capacity, facilities and services under hygienic, healthy and environmentally sound conditions (Baker, 2008; de Zeeuw and Dubbeling, 2009; UN-FAO, 2010; UN-HABITAT, 2008, USDA, 2009). In the remainder of this paper we will specifically concentrate on the role of and support needs for urban food production and the processing and marketing of urban-produced food. Appendix 1 provides a brief overview of the extent and benefits and risks of urban and peri-urban food production. Though, (peri)urban food production will never be able to supply cities with the required amounts of staples, urban and peri-urban agriculture can be an important source of vegetables; fruits, milk, eggs and certain meat products for cities, especially when rural food production and transportation systems are underdeveloped.

In order to realise the full potential of urban and peri-urban food production, there is need to develop a policy and institutional framework for the sector (which has not actually translated into policy action in most countries – USDA 2009). This would also enable unlocking critical technical and financial support services for different types of urban and peri-urban horticulture and production systems. Appendix 2 provides a synthesis of such needed support services.

¹ Donor and government agencies have been reluctant to provide long-term market information system (MIS) support, based on a poor history of past performance of government-managed MIS, the long-term nature of the funding required, and a lack of evidence to show that market information assists farmers in making better marketing decisions and increasing their incomes.

2. Assessing national and municipal policies and their constraints and opportunities for (peri-)urban horticulture

In this section, national and local policies in the East African countries Ethiopia, Tanzania, Uganda, Kenya and Madagascar will now be examined in detail and an analysis made of how these policies bear on urban agriculture/horticulture production, processing and marketing. Urban food and horticulture production activities are not only governed by agricultural, land use and marketing policies and plans; but also by various legislative provisions such as for example Local Government Acts, Physical Planning Acts, Public Health Acts and Environmental Management and Co-ordination Acts. In addition, each local authority is expected to prepare its own by-laws in line with specific legislative provisions. The level of assessment is constrained by the large variety of policy and plans bearing on UPA and the lack of actual availability and accessibility of the policy and legal documents. This in itself already calls for improved dissemination of such documents, necessary to enhance its implementation.

The review illustrates that since the colonial era UPA remained for long outside the urban land use system and therefore did not enjoy the much needed institutional support (Mireri *et al.*, 2006). Since the early 1990s however, policy review and reforms of UPA have been taking place in the different countries. In 2002, representatives of African local and national governments met in Addis Ababa in the workshop “Feeding Cities in the Horn of Africa” and signed a declaration aimed at promoting UPA (<http://www.ruaf.org/sites/default/files/Declaration%20Horn%20of%20Africa%20FINAL.pdf>). In 2003, the Harare Declaration on UPA in Southern and Eastern Africa was signed by government representatives from Kenya, Malawi, Swaziland, Tanzania and Zimbabwe. The declaration acknowledged the existence of UPA as a widely practiced activity in and around cities and towns in the region (http://www.ruaf.org/sites/default/files/Harare_0.pdf). Seven years later, the cities of Kampala and Nakuru have developed by-laws on UPA, while the city of Antananarivo integrated UPA in its “Green Plan” (Plan Vert). The Kenyan and Ugandan governments are currently developing a specific national UPA policy, Ethiopia is also considering steps in this direction, while Tanzania and Kenya have (recently) categorised UPA as an urban land use and included UPA in their urban land use policies. Notwithstanding these developments, several areas for improvement and follow up can be identified.

2.1 Policies in Ethiopia and Addis Ababa

The reduction of hunger and poverty have been central concerns for Ethiopia since 1991. The country's Sustainable Development and Poverty Reduction Programme (SDPRP) launched in 2002, gave major emphasis to the agricultural sector, recognizing its central position in the country's livelihood, and its potential to generate surplus to fuel growth in other sectors. The SDPRP's successor, the Plan for Accelerated and Sustained Development to End Poverty (PASDEP) 2005/2006-2009/2010 builds on the strategic directions pursued under SDPRP but also includes a “*focus on growth with particular emphasis on commercialization of agriculture, private sector development, and the scaling up of resources to achieve the MDGs*” (Government of Ethiopia, 2007, p. xi) and “*has also articulated policy and institutional innovation in agriculture and rural development, rural-urban linkages, and pastoral development, and spatial dimensions of the growth strategy*” (Government of Ethiopia, 2007, p. 5).

The Agricultural Development Led Industrialization (ADLI) strategy has the following major objectives (Government of Ethiopia, 2007, p. 24-25):

- “*Strengthening of human resource capacity and its effective utilization*”;
- “*Ensuring prudent allocation and use of existing land*”;
- “*Adoption of development path compatible with different agro-ecological zones*”;
- “*Specialization, diversification and commercialization of agricultural production*”;
- “*Integrating development activities with other sectors*”;
- “*Establishment of an effective agricultural marketing system*”.

Its objective of specialization, diversification and commercialization of agricultural production implies a shift to higher-value crops, including horticultural crops, for marketing both in domestic and export markets.

Recognizing the problem of Ethiopia's dependence on food aid relief (10% annually, rising to 25% in drought years), the Government also promoted the National Food Security Programme which is based on three pillars: *"increasing the availability of food through domestic (own) production; ensuring access to food for food deficit households; and, strengthening emergency response capabilities"* (Government of Ethiopia, 2007, p. 32).

However, it should be noted that these policies are centred on rural areas, and do not have any provisions for UPA (Nigussie, 2010). This situation may be changing though, as following a USAID-sponsored conference in November 2009 entitled *"Beyond Urban Gardens: Meeting the Growing Needs of Ethiopia's Urban Population"*, the state minister for the Ministry of Agriculture and Rural Development Dr. Abera Deresa indicated that a steering committee was going to be established to develop a strategy and policies for UPA. The Minister reportedly recognized the value of UPA for food security for low-income urban dwellers, and considered it was a very dynamic sector, which included irrigated year-round production, small scale processing of dairy products, vegetables and provided shorter marketing chains for consumers (Merga Yonas, 2009)².

In Addis Ababa, whilst UPA is an important activity, a clear policy framework is lacking. Support to UPA has been provided through an urban agriculture unit (which has undergone various structural changes since 1994). Nigussie (2010), reports that prior to 2003 the office was at Bureau level, but it is currently administered under the Addis Ababa City Administrative Trade and Industry Development Bureau as an Urban Agricultural Extension Service Core Process (UAESCP), which has two sections, one for Animals and Animal Products, and one for Plants and Plant Products. The UAESCP's vision is: *"To ensure food security at household and individual level in Addis Ababa City Administration and contribute to the national effort to build mentally and physically competent society, while its mission is to provide technical support, establish effective system in technologies provision together with their management practices and exercise regulatory works on organizations involved in agriculture and associated practices"* (Nigussie, 2010, p. 8).

Nigussie (2010) suggests that the effectiveness and efficiency of the urban agriculture unit has been decreased both by a lack of a clear policy and strategies, and by the structural changes which eliminated autonomy, cut back on staff and therefore created work overload.

The Office for the Revision of the Addis Ababa Master Plan (ORAMP) proposes that UPA be encouraged in the south-eastern areas and that horticultural development should be encouraged along riverbanks and livestock production in the peripheries (ORAMP, n/d³). Overall, 13.82% of the city's total areas (7,175 ha) was proposed as agricultural land (ORAMP, 2006, cited in Nigussie, 2010). However, other than this reference in the Master plan, UPA seldom features in the planning tools for the actual implementation of the plan (i.e. the Strategic Development Framework and Strategic Development Action Plans; and the Local Development Plans developed at the sub-city level which regulate land use) (Adam-Bradford, Pers. Comm., 18 November 2010).

There are strong pressures to develop land from other sectors, which is pushing up land prices; thus, as UPA is not protected and there is no form of land allocation on a long-term basis and suitable farming land is being lost to urban development, some of which is unplanned. Very few of the vegetable cooperatives currently operating in the city have security of tenure, which discourages farmers from making long-term investments, and also limits the extent to which services and finance can be provided (Nigussie, 2010).

Nigussie (2010) also concludes that not only are several measures required to integrate UPA effectively into urban development planning, but there is also an urgent need to include it in other programs aimed at poverty reduction, local economic growth, employment, urban youth initiatives, or managing HIV/AIDS at

²<http://www.addisfortune.com/Vol%2010%20No%20499%20Archive/New%20Strategies%20Cultivated%20for%20Urban%20Agriculture.htm>

³<http://www.telecom.net.et/~aamp/Environment.htm>

the community level through community gardens. In summary, a clear policy framework is currently lacking in Ethiopia, however, the value of UPA is increasingly being recognised and this is being translated into actions to review policy. For example, a workshop on UA policy for Addis Ababa is planned for the last week of November 2010 involving the UAESCP, the Ministry of Agriculture and Rural Development and the USAID Urban Garden Program (Adam-Bradford, 17-18 November 2010, Pers. Comm.).

2.2 Policies in Kenya, Nairobi and Nakuru

The Kenyan Strategy for Revitalising Agriculture (Government of Kenya, 2003) aims at improving the standard of living for Kenyans by substantially reducing the number of people suffering from hunger, famine or starvation. Urban food security however did not receive specific attention until August this year when the Kenya Food Security Steering Group (<http://www.kenyafoodsecurity.org/>), which includes several members from government Ministries and international organizations such as FAO, WFP, OCHA and others, called for a national urban food security assessment.

The Kenyan Economic Recovery Strategy for Wealth and Employment Creation (Government of Kenya, 2003) did not consider the role of UPA in income and employment creation either. There was virtually no specific central government or local policy support for UPA in Kenya until recently (Lee-Smith, 2010). This may be (partly) due to the fact that aata on area under urban and peri-urban production for different cities in Kenya is scanty. However, in Nairobi alone, more than 650 Ha of land is under urban and peri-urban production (Kangethe et al, 2008).

National legislation impacting on UPA however abounds in Kenya, though it is often contradictory. The Physical Planning Act 1996 excludes agriculture from the urban land use system. Acts such as the Agricultural Act and the Land Control Act allow local authorities to control transaction of agricultural land. However, the minimum agricultural land that can be transacted is about 1 acre, which does not take into account smaller land areas where intensive UPA activities are practiced. The Local Government Act (Section 114) allows local authorities to lease, transfer or allocate land for temporary use (including for UPA). Section 155 allows for *“the planting of any specified crop by person for the support of themselves and their families in areas which in the opinions of the (...) council are suffering from or likely to suffer from shortages of foodstuffs”*. Section 160, however, states that *“every (...) council shall have the power to plant, trim or remove trees, flowers and shrubs in or any public space”*, a legal framework by Nairobi City Council to prohibit cultivation and remove vegetables grown in public areas (Foeken, 2006; Ministry of Agriculture, 2010).

The Local Government Act (Section 173) and the Public Health Act (Section 157) deal with crop cultivation and irrigation in relation to the public's health and provide legal backing for prohibiting irrigation with sewage water. The Public Health Act also called for banning urban farming *“if it causes any nuisance or other condition liable to be injurious to health”*. Both the Public Health Act and the Water Act forbid the use of chemicals in UPA. According to current national legislation in Kenya, local authorities can thus allow, forbid, restrict, control or promote UPA. Which line is followed depends on the by-laws and ordinances made by the local authorities (Foeken, 2006).

In early 2009, however, and in an attempt to provide a more coherent policy framework for UPA, a central government task force (with representatives from the Ministries of Agriculture, Livestock Development, Local Government, Public Health and Social Services) drafted an Urban and Peri-urban Agriculture and Livestock (UPAL) policy (2010) in consultation with interest groups such as the Kenya Agricultural Research Institute (KARI), Mazingira Institute, The Nairobi and Environs Food Security, Agriculture and Livestock Forum (NEFSALF), Nairobi city council and the Provincial Department of Agriculture. The draft policy calls for support to UPAL as *“UPAL plays a crucial role towards improved livelihoods of the urban poor and has great potential in contributing to economic development of the country”*. The policy recognises potential benefits and (health and environmental) risks for the sector, as well as the lack of UPAL research and technology development. It also highlights poorly developed market infrastructure and lack of modern facilities such as cold storage, water and toilets. It therefore calls for a supportive policy and regulatory framework on UPAL farming; for setting aside land for waste management and capacity building on waste reuse; integration of UPAL in urban land planning; development of appropriate

technologies; enhancing budgetary support for research and extension; promotion of environmentally friendly production practices; support to producer organisations; improvement of marketing facilities, transport and information and development and enforcement of product and market standards. Finally a National UPAL Steering Committee and UPAL Coordinating Committee are proposed to spearhead operationalisation of the policy, while departments of agriculture and livestock should be established in each municipality and town council and be responsible for implementation and regular monitoring, for which purpose a set of clear output indicators has been developed (Ministry of Agriculture, 2008).

The draft policy is currently being discussed among the aforementioned stakeholders and a revised version will be brought to the cabinet for approval. Crucial to its implementation will be the availability of resources and required integration with other (sectoral) government policies and plans. It is for example not yet clear how the UPAL policy relates to the new National Land Policy (2009), tabled in Parliament in early 2010, which incorporated UPA and recognises that: *“Land is needed for food production and for the support of economic activities in all sectors. Good agricultural land continues to be converted to other non-agricultural uses thereby threatening the country’s productive capacity and long term food security”* (Section 3.4.2.1). Section 3.4.1.4 Planning for Urban Agriculture and Forestry of the National Land Policy (2009) states: *“Urban agriculture has not been properly regulated and facilitated. The following principles shall be implemented to provide a framework for the proper carrying out of urban agriculture and forestry: (a) Promotion of multi-functional urban land use; and (b) Putting in place an appropriate legal framework”*. Although such official recognition of UPA as a legitimate urban land use is an important step, the challenge again remains to operationalise the policy in clear legal and institutional frameworks and concrete strategies. Where the policy calls for land surveying and mapping, for example (section 3.5.4), productive and potentially productive areas in and around cities could be mapped and demarcated for UPA. As in Rosario, Argentina a municipal land bank for UPA could be set up, facilitating access of interested producer groups, and specifically women-headed households, youths or HIV-AIDS infected families (3 priority groups identified in section 3.6.10 requiring special interventions) to abandoned plots.

These changes at national policy level are also still to impact on town planning legislative provisions that generally do not yet recognise UPA as a legitimate land use that should be provided for in urban areas. This may also be due to the fact that cities, like Nairobi, do not have an agricultural department that may be effective in mobilising support for UPA.

Smaller cities, with large areas of municipal agricultural land, like Nakuru and Kisumu, however, have been developing municipal policies and programmes on UPA since 2005. The Nakuru Municipal Council (population approx. 250,000 in 2006) also developed a set of Urban Agriculture By-Laws between 2004-2007. This was the result of the Nakuru Urban Agriculture Research Project (NUAP) by the African Studies Centre, The Netherlands, which led to growing awareness among its local authorities that urban farming is very important to the livelihood of many of Nakuru’s inhabitants.

The Urban Agriculture By-Laws largely drew from the Kampala City Urban Agriculture Ordinance (see 2.5) “Urban Agriculture” as defined in the Nakuru by-laws, means any farming operations within the jurisdiction of the Council and includes crops, flowers, livestock, poultry, fish and any other farming activity that may be approved or recognized by the Council. UPA also involves processing and selling of a diversity of foods and non-food products. The section on crop production limits production in public areas (road reserves, wetlands, greenbelts, parks) to only those areas designated by the council. Permits are required by anyone *“who wants to practice urban agriculture within the jurisdiction of the council”* (Section 9). Licenses or permits have to be renewed each year. Use of untreated wastewater or sewage is prohibited and guilty by offence. Good crop husbandry practices should be applied and (surprisingly) use of pesticides and chemicals are allowed (Section 26), provided that the farmer follows *“the manufacturer’s instructions”* (Urban Agriculture By-Laws, 2006; Foeken 2006).

The importance of the Nakuru by-laws lies in the fact that awareness has grown that it is better to try to control (and where possible promote) UPA than to restrict or forbid it. The by-laws, even though implicitly, recognize urban farming as an important livelihood component for many of the urban poor and as a *legal* urban activity (Foeken, 2006). However, the Nakuru, as well as the Kampala by-laws (see 2.5) are still of a basically restrictive and regulatory nature and focused on punitive approached. Permits and regulations

are needed in order to protect human health and the environment and will help build support for UPA among richer citizens and policy makers. It might be questioned however, if creating positive incentives and support structures will not have a more positive impact on the situation of the poor and development of UPA.

Finally, the further integration of UPA into municipal and regional urban planning (for example by creating easily accessible farming zones) remains a challenge to be tackled. In Kenya, the government recently created a Ministry of Nairobi Metropolitan Development charged with the development of the Nairobi Metropolitan Region. The first edition of the Nairobi Metro 2030 strategy document (Ministry of Nairobi Metropolitan Development, 2008) is consistent with the Kenya 2030 vision and seeks to deal with the country's main development issues, including economic growth, employment and wealth creation, poverty alleviation and youth engagement. Specifically, the Ministry is in charge of managing the Nairobi metropolitan region, including Nairobi city and surrounding areas such as Kiambu, Thika, Muranga, Machacos and Kajado to ensure integrated spatial growth and strategic programmes for the provision of social, economic and infrastructural services (Ministry of Nairobi Metropolitan Development, 2008). The Nairobi Metro 2030 strategy document aims for *"the visible protection of the region's agricultural and natural support base"* (page 32) as *"designation of agricultural areas will reinforce objectives of protecting the agricultural land base of the region [...]. and promote agricultural activities by restricting urban growth and also address issues of food security"* (page 68). The strategy also states that: *"Enhancing food safety and security, including all forms of agriculture, will demand development of crops and livestock processing and markets, capacity building and technology and dissemination, as well as certification and packaging of agricultural produce, including certification of food outlets"* (page 99). Finally, when talking about ensuring a safe and secure Nairobi Metropolitan Region, page 107 states that *"[...] The key focus shall be to improve preparedness, reduce risks and vulnerabilities [...]. and take advantage of opportunities for positive urban reform and social change. In this respect three strategies will be employed [...] [the third one being] promotion of urban agriculture"*. Though the first and second strategy are developed in much more detail, no proposals are made on how UPA should be promoted and by whom. Nor are clear benchmark indicators and financial resource allocation discussed in relation to regional UPA production or employment generation. As long as this is not done, the promotion of (urban) agriculture remains on paper only.

2.3 Policies in Madagascar and Antananarivo

The Madagascar National Action Plan for Food Security (2006) and the Madagascar Action Plan 2007-2012 both call for the reduction of poverty and substantial increase in agricultural production (Government of Madagascar, 2006). The Plan prioritises the rural population and rural agricultural sector. Migration to urban areas, decrease in purchasing power and insufficient growth of the agricultural sector, have also, however, put over 50% of the population of the Antananarivo agglomeration, in risk of (temporary) food insecurity. It is for this reason that the Ministry of Agriculture, the City of Antananarivo and the 28 rural communities in the Greater Antananarivo region decided to protect their cultural agricultural heritage and promote urban and peri-urban rice, vegetable and fish production for reasons of food security and as an economic activity (UN-FAO, 2009).

Madagascar's capital city, Antananarivo, is a typical tropical mountain city, in which human habitat has traditionally concentrated on the hills and mountains, leaving the valleys and lowland areas for agriculture. To date, agricultural areas extend right into the city centre and continue to cover the urban lowlands and the surrounding floodplain. Agricultural land use accounts for 43% of the 425 square kilometres of land within boundaries of the Antananarivo agglomeration (PUDi, 2004) and is comprised of 'brick-rice-duck-fishing' systems, a variety of horticulture production systems and to a lesser extent production of root-crops (cassava), fish and livestock.

The Urban Development Master Plan Horizon 2015 (PUDi, 2004) underlines the need for more structured and sustainable urban planning to conserve the city's cultural and natural habitat and improve living conditions in the city. It calls for protection of the agricultural and green zones, of both intra-urban agriculture as well as peri-urban agricultural zones (page 43, 45, 57, 74 and 99), because they play an important role in water management and protect the city from floods and heavy rain-fall and because they offer an important income source for lower-income families. The plan also calls for improved access to

public water and sanitation points throughout the city as well as improved waste(water) management, including establishment of composting units in each of the towns making of the Antananarivo agglomeration. Composting should reduce waste volumes, enhance the life of the landfill and serve as inputs to agriculture. The PUDi also talks about better equipment of neighbourhoods markets, though not in direct relation to food. In 2004, the Mayor of Antananarivo suspended construction licences in the northern rice plain, a decision that remains in force until today. The 2006 “Green Plan” (Plan Vert) was developed in order to operationalise parts of the urban development plan. It calls for the creation of a protected agricultural area of 2000 ha in the northern plain to maintain its role as a buffer zone protecting the city against catastrophic floods. Agriculture in the southern plain is however “sacrificed” to urbanization. It also proposes the rehabilitation of the urban Marais Masay lake and surrounding areas, where fish are captured every day and intra-urban market gardening occupies the zones bordering the lake; and it outlines a proposal for the establishment of a natural/cultural “museum” to attract tourism, preserve the traditional rice-duck-fish systems and preserve plant variety (Plan Vert, 2006).

Notwithstanding these plans, brick-making activities, destruction of farm land and disturbing water regimes are still not prohibited. Only one town in the Greater Tana region has zoned areas in which brick-making permits may be issued. Permits for draining and filling low land areas for construction were only effectuated from 2003-2004 onwards. Plans for the construction of roads in some lowland areas currently under watercress production systems have remained on hold. The risks of flooding, erosion, and even landslides associated with these road projects are being carefully considered and the authorities are reluctant to sacrifice watercress production due to its multiple functions (food, economic and environmental). Discussions have moved up to regional level, with the search for possible nearby suburban areas in which cleaner water sources could be used to produce watercress in less risky conditions, as a (partial) alternative to current waste-water production systems in urban areas. Studies currently underway as part of a project looking at quality and health issues related to urban food production and should provide more detailed information, helping decision-makers to determine whether intra-urban watercress production should be maintained (Aubry *et al.*, in press).

In 2008, the Directorate for Management of Green Spaces in Antananarivo was replaced by the “Directorate for Green Spaces and Urban Agriculture (DEVAU)” in accordance to the 2006 Green Plan. This new directorate has focused its work to date on two key areas: rehabilitation of a neglected municipal rice field in the northern plain (14 ha) and of the Lac Masay. In 2009, the city authorities requested joint action by the Analysis of the Sustainability of Agriculture in the Metropolitan Area of Antananarivo (ADURAA) research project and the international network of Resource centres on Urban Agriculture and Food Security (RUAF), to support a process of strategic planning for agriculture in the city. As a first step a multi-stakeholder platform of various stakeholders concerned with UPA has been set up and a FAO supported project to develop UPA will be implemented with the Ministry of Agriculture from late 2010 onwards.

Future interventions will need to prioritise real preservation and regulation of existing land areas and promote and control use of potentially new agricultural spaces. The Antananarivo multi-stakeholder platform on UA concluded that it would be essential to:

- Develop a detailed land use map of the actual areas of land occupied by UPA and the vacant areas of land that could potentially be used, and describing their property statutes,
- Develop a map on the different UPA production systems and related environmental and health risks and vulnerabilities affecting each of them (erosion risks, vulnerability to flooding, contamination risks).
- Develop zoning plans for different UPA types. These zoning plans should be included in the city’s urban master plan and detailed communal development plans (Dubbeling and Aubry, 2009).

Next to this, product quality control and marketing transport and organisation also needs to be enhanced. Development of infrastructure systems linking cities with the surrounding areas will be crucial to optimally balance urban, peri-urban and rural production (Anonymous, 2010).

2.4 Policies in Tanzania and Dar es Salaam

In Tanzania, national policies are organized in three tiers: the long term national development strategy, known as Vision 2025, the medium term national poverty reduction strategies and specific sectoral or cross-sectoral policies. In the Vision 2025, produced in 1998, it is clear that there is strong recognition of

the central role to be played by agriculture in the development of the country. The goal of the Vision is to “transform Tanzania from a least developed country to a semi-industrialized, middle income country with a high level of human development free from abject poverty by 2025 and a high productivity agriculture that is well-integrated into the rest of the economy” (United Republic of Tanzania, 2008, p. 12).

What is of additional interest in the Vision is the importance attached to food self-sufficiency. This has been an important objective for Tanzania since the 1970s (Foeken, 2005) and it clearly continues to be important. Indeed, in the Vision 2025 the first goal identified for Tanzanians to reach high quality livelihoods is “Food self-sufficiency and food security” (United Republic of Tanzania, 1998).

This clearly applies to urban residents as well as rural dwellers, and farming activities in urban areas are dealt with in various pieces of legislation. Agricultural activities in urban areas were first envisaged in the Local Government (Urban Authorities) Act of 1982 (Act Number 8 of 1982)⁴ (United Republic of Tanzania, 1982). More precisely, under section 54 of this Act, urban authorities were expected to “regulate and improve **agriculture, trade, commerce, and industry**” (emphasis added), and section 80 gave the authorities powers to pass applicable by-laws (Mniwasa and Shauri, 2001)⁵.

Though UPA as a mechanism is not explicitly mentioned, it is also implicit in the fourth aim of the National Food and Nutrition Policy of 1992 (United Republic of Tanzania, 1992), which is: “To strengthen the procedures of obtaining and supplying food within the household, villages and **towns by utilizing locally produced foods**”⁶. (emphasis added).

The Urban Farming Regulations of 1992 made under the Town and Country Planning Ordinance (Cap. 378) Section 78 defined urban farming as “the carrying out of plant and animal husbandry activities within statutory township boundaries” (p. 16), and indicated the limits to plot size, rearing systems for livestock and maximum number of cattle per person ⁷ (Mlozi *et al.*, 2005).

The Agriculture and Livestock Policy of 1997 put forward by the Ministry of Agriculture and Cooperatives (United Republic of Tanzania, 1997) stated that: “Agriculture is not a principle function of towns but when properly organized urban agriculture has the potential to provide employment, income and is a supplementary source of food” (p. 64), therefore indicated that: “The Government will continue to regulate the conduct of urban agriculture and ensure it does not disrupt planned urban development” (p. 65).

This policy also provides explicit attention to the support of horticultural production (vegetables, fruits and flowers). Domestically, the policy identifies that there are problems of poor production organization (linked to inadequate supply of seeds and inputs, and poor research and extension services), poor marketing which results in huge post-harvest losses, inadequate storage, packing technology and processing facilities which in turn created gluts and severe shortages of the produce, poor transport systems, and poor quality control and packaging systems. The policy thus indicates that: “to enhance production of high yielding and disease resistant varieties of these items, the Government will give high priority to the strengthening of research, extension and small scale irrigation” and “the Government will assist the private sector to organize domestic as well as export markets for these crops. Government responsibilities will be in the areas of quality control, advocating for acquisition by the private sector of capital for storage, packaging and transport facilities, transportation net works and providing market information services” (United Republic of Tanzania 1997, p. 41).

⁴ This Act “provided for the establishment, composition, functions and legislative powers of the urban based local government authorities (urban councils) in Tanzania” (Mniwasa and Shauri, 2001).

⁵ <http://www.lead.or.tz/publications/decentralization/4.4.urban.authorities.php>

⁶ <http://www.tanzania.go.tz/sectoralpol.htm#Food> and Nutrition Policy

⁷ “No person shall occupy or use more than three acres of land for urban farming; only zero grazing is allowed and the number of cattle is restricted to four head per person; and farming activity which is deemed to constitute a nuisance in the form of noise or smell or pose physical danger to the safety of the public shall not be permitted in areas other than those zoned for urban agriculture” (Mlozi *et al.*, 2005, p. 16).

There could be indirect benefits and support for urban and peri-urban horticulture, deriving from this attention to the horticultural sector (though the document does not actually make this link to UPA). It should be noted, however, that the policy is geared also towards strengthening the horticultural sector for export, and if not carefully managed, this could generate a conflict between production to ensure urban food supply and production for export.

UPA is also explicitly addressed in the Human Settlements Development Policy of 2000 put forward by the Ministry of Lands and Human Settlement Development (United Republic of Tanzania, 2000). This policy recognizes the existence of UPA in both developing and developed countries, its contributions in terms of income, employment, and a supplementary, affordable food supply, and its potential for urban greening. It identifies that: *“Although urban agriculture is considered an important component of sustainable development, improperly practised urban agriculture conflicts with other urban land uses and leads to land degradation, water pollution and is a threat to health and safety”* (p. 48).

The policy statement in regards to UPA therefore indicates that the government will (p. 48):

- *“Designate special areas within planning areas whereby people will be granted legal rights to engage themselves in agricultural activities”* ;
- *“Continue to regulate and research on the conduct of urban agriculture, and will ensure that urban agriculture does not disrupt planned urban development”* ;
- *“Review existing laws to facilitate planned urban agriculture”*;
- *“Facilitate the construction of appropriate infrastructure to mitigate/prevent land degradation, water pollution and health and safety hazards in areas whereby urban agriculture is permitted”*.

Thus, the political and legal context at national level is broadly favourable to the practice of UPA. At the local level, however, the situation is quite complex. A study undertaken in 2000/2001 in the towns of Mbeya and Morogoro (Foeken, 2005) indicated that the local by-laws effectively made it illegal to farm in most of the built-up areas, so the practice was restricted mainly to peri-urban locations⁸. Nevertheless, there were marked differences in attitudes between the two towns. In Mbeya the only policy was restrictive. The Mbeya Municipal Council (Regulations of Cultivation) Bylaws, 1982 (reproduced in Foeken *et al.*, 2004) set out where farming is permitted, and restrict types of crops that could be grown in these areas: *“All crops may be cultivated in the areas indicated in the second schedule provided that no person shall plant any permanent crops in those areas without a written permission from the Municipal Director of the Mbeya Municipal”*. The by-laws include many staples in the category of permanent or semi-permanent (such as maize, finger millet, rice, sorghum, sweet potatoes, cassava, wheat). If the by-laws were enforced (which was not the case in either of the towns, and also appears to be a common tendency in Tanzanian towns, as it has reported for example in Dar es Salaam - Jacobi *et al.*, 2000; Mlozi *et al.*, 2005), this would clearly push production systems towards horticultural products (except for fruit). In practice, Foeken (2005) reports that there was no official support for UPA, either in terms of extension support or a policy for selecting areas where farming would be allowed. The by-laws are also clearly in need of updating as the municipal officer alone determines whether “good” husbandry practices are being implemented (which could well lead to situations where farmers’ needs and knowledge are disregarded) and furthermore makes the use of insecticides mandatory (a questionable regulation that could prevent agro-ecological measures being explored, and could be a strong economic constraint for the poorer farmers).

In Morogoro, farming in the built-up areas was officially illegal, but allowed *“on the condition that environmental degradation is being prevented and city development is not being hindered”* (personal communication of Mr. Kalunelo, Acting Municipal Director, Morogoro Municipality, cited in Foeken, 2005, p. 23). Furthermore, the Municipality had launched a policy to develop two types of plots: “garden plots” in Green Belt areas, and plots in *nguvukazi* areas, which were located on former sisal estates, and which

⁸ The Tanzania Land Act 1999 states that a “peri-urban area means an area which is within a radius of ten kilometers outside the boundaries of an urban or semi built up area or within any large radius which may be prescribed in respect of any particular urban area by the Minister” (p. 29).

had been incorporated into the town because of urban growth (personal communication of Mr. Mkupete, Head, Department of Town Planning, Morogoro Municipality, cited in Foeken, 2005, p. 29). The Ministry of Agriculture was also attempting to propagate organic farming by bringing livestock keepers and crop cultivators together (personal communication of Mr. Maeda, Municipal Agriculture and Livestock Development Officer, Morogoro Municipality, cited in Foeken, 2005, p. 23), and to organize farmers into Saving and Credit Schemes, as urban farmers did not have access to credit.

In Dar es Salaam, backyard farming is not regulated (Jacobi *et al.*, 2000), but farming in open spaces is. Under the Sustainable Dar es Salaam Project 1992-2003 (UN-HABITAT and UNEP, 2005) prepared a database on potential agricultural land around the city, but it is unclear whether there have been official initiatives to allocate farming land in urban zones. A recent report suggests not (Mkwela and Banyani, 2008).

Given the variations between towns, it is difficult to draw a conclusive position on the extent to which policy developments in Tanzania address constraints and provide opportunities for UPA producers (there is nothing in the policies that affect processors and retailers). It is even more difficult to determine what the impacts of these policies may have been for the poor, the marginalised and women-headed households (Lee-Smith, 2005). Morogoro, for example, provides a very positive case for support of UPA, and in particular the Municipality addresses one very crucial constraint which is access to land. However, Foeken (2005) cautions that the very poor are unlikely to benefit from the policy as the garden plots are very expensive (they entail one-time costs for surveying and annual renting costs), and that the *nguvukazi* plots, though more affordable tend to be allocated through personal networks, to individuals with connections to the ward leaders.

2.5 Policies in Uganda and Kampala

To date, there is no UPA national policy for Uganda (though see further on). UPA is legally recognised in Kampala, however, as a result of a process which has its roots in Uganda's decentralization, which took place in the 1990s.

When Kampala became a District, agriculture became responsibility of the City Council, though initially there were no resource allocations within the city; indeed at this time UPA was still considered an illegal activity based on existing by-laws. In 1999, Kampala City Council (KCC) started to recognise the magnitude and value of UPA and the need to therefore legalise and regulate the practice (Department of Production and Marketing, 2007, Lee-Smith *et al.*, 2008). A review of the by-laws was initiated through a participatory process from 2003 and as a result a set of five Ordinances on Food Production and Distribution were formalised as laws in the Uganda Gazette in December 2006 (Lee-Smith *et al.*, 2008)⁹.

The legalisation of UPA is an important step in recognising its value for urban food supply and supporting its development. Nevertheless, as Lee-Smith *et al.* (2008) caution, although the provision of a legal framework for UPA could provide new opportunities for the urban poor to feed themselves and develop commercial enterprises, whether in practice it will actually facilitate or increase restrictions on UPA and food handling activities would need to be evaluated over time. After all the level of understanding of the changes, especially those regarding temporary permits and commercial licences, among lower level operatives of the Council and the public, may mean continued corruption and patronage systems in the implementation of the Ordinances. Kiguli *et al.* (2003, cited in Foeken, 2005) suggest that the Council prefers to provide licenses to agro-businesses, for example, large poultry farms. Azuba and Cans (2006) report that there has been resistance amongst urban farmers over the issue of paying for the permits, which may be related to earlier failures of KCC to provide services in return for taxes to businesses and residents.

The measures adopted in the Kampala City Urban Agriculture Ordinance (Kampala City Council, 2006) (KCUAO) were examined in order to attempt to identify potential constraints and opportunities for different

⁹ Of relevance to this review are the Kampala City Urban Agriculture Ordinance (2006) and the Guideline to the Kampala City Urban Agriculture Ordinance (KUFSA/LCC and Urban Harvest (2005). The other Ordinances deal with Livestock, Meat, Fish and Dairy.

stakeholders. Overall, the KCUAO centres on the protection of consumer health, and to a lesser extent, of the environment. There is little in the measures that would tackle key constraints for UPA producers, processors and retailers or provide any opportunities for these actors, other than the recognition of agriculture as a legal form of land use under certain conditions. It should be noted that greenbelts, parks and wetlands are not designated for UPA, and as wetland areas appear to be widely used for urban farming (as well as other activities) enforcement of these measures would result in loss of access to land for some stakeholders¹⁰. The KCUAO provides for some form of containment of contamination of UPA by other activities, though the enforcement of some of these rules appears to be in doubt. It should be noted, however, that this analysis is not based on any impact data, as to date no studies have been undertaken on the effects of the Ordinances in the city (Lee-Smith, Pers. Comm. 06 November 2010).

Thus, as in the case of Nakuru, mentioned in 2.3, the KCUAO mainly focussed on restricting unwanted behaviour by establishing a system of licences, regulations, controls and sanctions. It is not clear how the ordinances are combined with more development-oriented measures to support and stimulate the sector (training, marketing support, access to land etc.), and it may thus be questioned how and when the original focus on poverty alleviation will in fact be achieved. These observations may feed the discussion in Kampala, since policy and programme development are ongoing processes (Wilbers and de Zeeuw, 2006). Indeed, the wider benefits of UPA in terms of potential food security, income generation and environment are recognised by certain stakeholders in the KCC. The Department of Marketing and Production (2007)¹¹, for example, has argued that UPA could contribute environmentally in the following ways (Department of Marketing and Production, 2007, p. 16):

- *“UPA can help reduce the ecological footprint of the nation’s towns and urban centres by reducing the need to ‘import’ resources from distant areas and by reducing the burden placed on the hinterland’s natural resource base”.*
- *“Urban farmers can contribute to reducing wastes that pose a threat to water quality, soil, and human health by making productive use of organic wastes as mulch and fertiliser. Likewise, UPA has the potential to contribute to easing sanitation issues in cities”.*
- *“Wastewater (grey water) can be reused to irrigate crops thereby conserving water”.*
- *“The greening that results from UPA improves air quality, reduces pollution, aids in carbon fixation, and influences microclimate”.*
- *“UPA contributes to the preservation of biodiversity through the cultivation of indigenous food crops, horticultural varieties, and medicinal plants”.*

More broadly, the Department has reflected also on the implications of Uganda’s agricultural strategy which at the time of writing of their report was oriented towards gradually replacing traditional subsistence agriculture in rural areas with high-value cash crops for regional and international markets (Department of Marketing and Production, 2007) for UPA. It considered that: *“UPA is valuable in that it can complement rural agriculture and help ensure that the nation’s development continues uninterrupted: urban agriculture will reduce urban centres’ dependence on rural farmers for food which will enable rural agriculture to continue to focus on cash crops. Increased food self-reliance in cities will also help ‘cushion’ livelihoods during years that cash crops may fail due to unforeseen environmental events or fluctuations in the world’s markets”* (Department of Marketing and Production, 2007, p. 16).

From the analysis of the new five-year Agriculture Development Strategy and Investment Plan (ADSIP) for 2010/2011 – 2014/2015¹² it would appear that, though the country is giving recognition to the

¹⁰ A review of news items (<http://www.earthwire.org/africa/?t=200463&tn=Wetlands>) shows that in recent months, there has been strong controversy implicating the Mayor as well, over land titles being issued to developers for areas of Kampala wetlands.

¹¹ In the Urban Agriculture Section.

¹² The ADSIP is based on Uganda’s National Development Plan 2010/2011-2014/2015, translating “the broad public sector interventions into a sector-wide plan with specific subprogrammes, activities and targets” (Ministry of Agriculture, Animal Industries and Fisheries, 2010, p. 27). The ADSIP objective and sub-programme structure are supposed to derive from the National Agricultural Policy, though the ADSIP document indicated at the same time that the NAP from which it derived was yet to be completed (Ministry of Agriculture, Animal Industries and Fisheries, 2010, p. 29).

“fundamental importance of agriculture to the Ugandan economy and of the central role it has to play in development, economic growth and poverty reduction” (Ministry of Agriculture, Animal Industries and Fisheries, 2010, p. 8), support is indeed more likely to be given to key commodity crops.

Horticultural production, which would have a critical role to play in contributing to the development objective of *“Household food and nutrition security improved”* (Ministry of Agriculture, Animal Industries and Fisheries, 2010, p. 13) is not highlighted anywhere in the document as a priority. No national program is in place yet to enhance city supply of horticultural products (Ssemwanga, 2010). This reinforces the view that UPA will be needed to ensure horticultural supply to urban centres, however, the Department’s explicit vision of the complementary roles of UPA and rural agriculture is certainly not echoed in the ADSIP. This document only briefly mentions that a policy on peri-urban agriculture (amongst others) is urgently needed¹³ (see Component 3.3.2: Policy analyses and implementation within Sub-programme 3.2: Planning and Policy Development at MAAIF – Ministry of Agriculture, Animal Industries and Fisheries, 2010). This generalised lack of support to horticulture could well be a stimulus for the development of a peri-urban/urban horticultural supply chain, however, it also implies that there will be no indirect benefits to urban farmers from advances in horticultural research and development, either.

In terms of food distribution challenges, Ssemwanga (2010) has emphasised the difficulty of articulating growers to traders, because of the scattered nature of production units, poor facilities in formal markets which constrain volume trading, and the rise of informal vending points (which undermines the formal markets), associated to political cronyism.

2.6 Some general messages for policy makers

Although the analysis made is limited by the amount of actual policy documents available, a relatively clear picture is emerging. There seems to be growing awareness that UPA provides one important solution to the problems of food security confronting the Eastern African region, and that it could play a much greater role if policies were better targeted at poor and marginalized households (Foeken, 2008 Lee-Smith, 2010). Based on studies carried out in Nakuru (Kenya) and Morogoro and Mbeya (Tanzania), it is shown that *“those who would benefit most from urban farming, namely the poor, are actually under-represented among urban farmers, and those who do farm perform worse than their richer counterparts. The legal and policy setting in these towns is such that the poor do not generally benefit from policy measures taken”* (Foeken, 2008).

Preparing for an urban future requires, at a minimum, respecting the rights of the poor to the city. This includes their “Right to Food” and “Right to their participation”. Urban growth cannot be prevented but should be managed applying several options that respect human rights. Promoting gender equity and equality, making education universally available and meeting reproductive health needs, are important for their own sake (UN-HABITAT, 2008). Promoting urban food production and security is another crucial aspect that still needs more attention. In doing so, cities need a longer-term and broader vision of the use of urban space to reduce poverty and promote sustainability. This includes an explicit concern with the land needs of the poor, for housing purposes, but also for farming. This appears to be more likely to happen in those countries where food security through own production has been, and continues to be a strong priority, as is the case for Ethiopia and Tanzania.

UPA potentially involves several different policy goals, be it social and poverty alleviation, food security, income, employment and enterprise creation and urban environmental management. Ideally, governments and policies should identify their priority goals. **Most of the policies analysed focus on urban and peri-urban food production for reasons of food security and agro processing and value addition activities are not provided for.** Though general agricultural policies and plans do articulate production to markets, these aspects are dealt with in a general way and are not specific to urban food distribution. Perhaps this suggests that the dominant perception amongst policy makers is that UPA plays a role in household food security, and perhaps small-scale income generation, but does not contribute

¹³ Nevertheless, work on a national urban policy draft has been on-going for some time (Department of Production and Marketing, 2007) and according to Diana Lee-Smith (Pers. Comm. 06 November 2010) the development of this policy has been allocated a specific budget.

really significant amounts to urban markets (which is not the case, as can be seen from the data presented in Appendix 1). In the few cases where policies and plans do deal with urban food distribution, they mainly talk about provision of markets, or health and food safety regulations to ensure the cleanliness of the products (like the urban agriculture ordinance in Kampala). **Hence policies, at least those that were analysed, tend to overlook informal urban processors and retailers.**

In any case, policy objectives should be clear, and strategies targeted to achieve specific outcomes and be monitored accordingly (Dubbeling *et al*, 2010; Lee-Smith, 2010). Furthermore, if policies or plans lack clarity on the contribution of the sector to overall development goals, as a result, it is often unclear which type and scale of UPA enterprises the government seeks to stimulate and how it can best do so. Use of appropriate policy instruments such as (environmental) legislation, training, financial support or economic incentives, or others should be defined to enhance specific agriculture production systems in specific areas of the city.

UPA can only be successfully integrated into urban policies and planning if coordination between various government levels, structures, and departments is improved and can ensure that land-use planning is coordinated with community development and health authorities for the benefit of food production (Redwood, 2010). Such integration also requires that local producer and community groups, who tend to be the city's most excluded groups, are recognised as legitimate actors in urban management and decision-making (Mougeot, 2005). Competition between interest groups cannot be ignored as the making and realization of policy is a game of power and conflicting interests. So far, the case of NEFSALF in Nairobi represents the only instance of bottom-up organizing of a lobby by farmers themselves (Lee-Smith, 2010), though multi-stakeholder policy formulation in 1994 in Dar es Salaam, Kampala and more recently in Antananarivo has shown to be important for effective policy implementation.

Lee-Smith (2010) also adds other words of caution with regard to policy implementation. She states that *"much ink can be wasted on policy recommendations and policy documents if the political will to make them work is missing"* (p. 15). In general, several factors contribute towards (nearly all) policies being less effective than anticipated. The most frequent reasons are: lack of clear objectives and strategies with related output indicators; poor representation of end users in the policy formulation process and poor dissemination of the policy itself; poor coordination in implementation and lack of qualified staff and funding to implement the identified activities.

As UPA takes place in a multi-sectoral environment, and touches on a large number of urban management areas (e.g. land-use planning, environmental and waste management, economic development, public health, and social and community development), and involves a large diversity of systems and related actors (including local, regional and national governments, research, training and support organizations, financial organization, input providers, processors and vendors) it is a complex area for policy. UPA should be integrated in national policies, such as agricultural and marketing policies, national food security and poverty reduction strategies, national sustainable consumption and production (SCP) policies, Agenda 21 plans etc. Local initiatives on UPA are often constrained by restrictions in mandates and in national legislation. This makes local actors hesitant to develop more pro-active policies and programmes due to lack of financial and technical support from the national level.

At **national level**, an important step will be the **creation of an institutional home for an urban food supply policy and programme**¹⁴. In most countries, the Ministry of Agriculture seems the best equipped to take a coordinating role on UPA. Experiences to date reveal that close cooperation with other Ministries is also required (Health, Social Development, Economic Development, Lands) and that these ministries have to play an active role in the design and realisation of UPA-related programmes, either as part of their own sector policy or as inputs to the agricultural policy or programme.

¹⁴ Brazil is –to our knowledge- the only country where local governments have set up a 'Municipal Secretariat for Food Policy and Supply'

Important issues to be given attention in national policies on urban food production and consumption are the following:

- **Remove unjustified restrictions on urban food production and marketing** in national laws and regulations to be replaced by evidence-based new policies and regulations (for example basing regulations regarding the reuse of wastewater and excreta in agriculture on the 2006 WHO guidelines replacing the ones based on strict water quality norms).
- **Make available funds** for the (co-)financing of local urban food production and distribution programmes, preferably involving local authorities as well as civil society actors and private commercial actors. This would entail providing loans for more market-oriented urban producers and subsidised inputs or grants to engage the very poor in urban food production and processing activities, as well as encouraging other financing institutions to do the same (e.g. by providing guarantees to credit institutions willing to provide credit to small urban producers).
- Include issues related to urban and peri-urban production and marketing into the **national agricultural research agenda and agricultural extension programmes**, as well as into the national educational system (universities, colleges), giving due attention to specific technology development and training & education needs related to UPA.

Urban authorities, with support of national institutions, can substantially contribute to the development of safe and sustainable UPA/horticulture production and marketing by:

- Developing an **Urban Food Policy and Programme**, complementing national agricultural and food security policies and including related activities in municipal budgets.
- **Removing unnecessary legal restrictions on UPA production and marketing in existing policies**, laws and ordinances and **formulating new facilitating and guiding policies** on UPA
- Selecting **a department that will act as the lead agency** on UPA development and establish an inter-departmental committee on urban food production and consumption. This committee could then invite relevant local actors to take part in a multi-stakeholder platform or “food council” on urban food production and consumption (as done in Antananarivo) that will jointly analyse the presence, role, problems and development perspectives of urban food production, distribution and consumption issues in the city-region, improve institutional coordination and develop integrated policies. In Kampala, Uganda, for example, an inter-departmental working group developed new municipal regulations on UPA and livestock through a process of intensive consultation with all relevant stakeholders.
- **Intensifying data collection and analysis on the role the impacts of urban and peri-urban food production and distribution on city food supply** by implementing a situation analysis, identifying food production activities, food operators and consumer practices in purchase of food; understanding the needs and service requirements of producers, processors and vendors; mapping productive and potentially productive areas of land and the location of informal food markets and identifying causes of possible food contamination; and analysing the existing policy frameworks and the effectiveness of various policy measures and action strategies to support UPA and enhance urban food security. There is still a lack of reliable data on urban demand for food and the contribution made by urban, peri-urban and rural supply sources. Evidence-based information need to be better disseminated.
- **Integrating UPA production, marketing and processing in various sectoral policies and plans** (see also Tables 3 and 4 below).

Table 3: Integrating UPA production in sectoral policies and plans

Type of policies	Strategic interventions
Agriculture policies	<ul style="list-style-type: none"> -Support or strengthen local food production activities, such as small-scale commercial farming, rooftop gardening, home gardening and/or community garden projects, school gardens often combined with food education, gardens at hospitals and clinics often combined with nutrition education and HIV-Aids support programmes. -Strengthen the organisation of urban producers and their capacities to design and implement projects to improve their food and marketing systems and to actively participate in local planning activities. - Provide training and technical assistance to urban producer groups in: ecological farming practices, low-space production technologies, proper management of health risks, farm development (e.g. intensification and diversification). - Provide access to infrastructure, equipment and inputs (e.g. greenhouses, irrigation equipment, tools, quality seed/seedlings at cost or subsidized prices). - Enhance access to and efficient use of uncontaminated irrigation water by providing treated wastewater and training on its use or promoting systems for rainwater collection and storage. - Provide incentives for on-farm risk reduction and promote safer irrigation methods (eg wastewater adapted drip irrigation). -Promote proper use of urban waste as fertiliser. -Promote ecological farming practices and replace chemical pest and disease control by integrated pest and disease management. - Enhance access to credit and financing for farm investment and production.
Marketing policies	<ul style="list-style-type: none"> -Put in place strategies to reduce post-harvest losses (improved storage, packaging and handling) -Promote self-sufficiency and reduce dependency on imports. -Facilitate market-oriented, entrepreneurial and enterprise-driven urban horticulture
Land use policies and plans	<ul style="list-style-type: none"> -Formally accept of UPA/ horticulture as a legitimate use of urban land. -Integrate UPA into urban development and master plans, urban land use and zoning plans, as well as active maintenance of the protected agricultural zones. -Reinforce access to and security of land by: <ul style="list-style-type: none"> - Integrating UPA in social housing and slum upgrading programmes by including space for home gardens or community gardens, street trees for shade and fruits. - Making municipal land available to groups of urban poor households through medium-term lease arrangements or providing occupancy licenses to the urban poor. -Establishing fiscal and tax incentives for land owners who lease out vacant private land to groups of urban poor producers. - Promotion of multi-functional land use. - Assistance to re-allocation of urban producers who are poorly located to other better suited (peri)-urban areas.
Environmental policies and climate change adaptation plans	<ul style="list-style-type: none"> -Link the “urban food security” agenda with agendas related to climate change adaptation, disasters risk reduction and urban environment, by: <ul style="list-style-type: none"> - Promoting maintenance of green, open, productive and multifunctional spaces in and around the city. -Protecting and stimulating sustainable UPA in flood zones and wetlands and on steep slopes in order to prevent construction in such areas and to reduce run-off. -Promoting a shift from centralised “end-of-pipe” treatment and disposal systems to decentralised and flexible treatment of wastewater and productive reuse in UPA nearby. -Promoting waste separation at the source and composting of solid organic waste for productive use. - Installing environmentally sound treatment plants near waste transfer stations or areas of final waste disposal (e.g. landfills). -Controlling (industrial) pollution of urban land, water and air (which threatens the safety of urban food production and consumption). -Separating and treating industrial and hospital waste and wastewater at source.
Health policies	<ul style="list-style-type: none"> - Raise awareness among national and local government officials on the new WHO guidelines on the agricultural use of urban wastewater and excreta and application of these at local level.-Monitor the quality of irrigation water from rivers and wastewater outlets; certify safe production areas; restrict crop choice or production systems in areas where minimum water quality cannot be guaranteed. - Educate farmers (also workers and consumers) on managing health risks associated with re-use of wastewater and on proper management of agrochemicals; introduce cheap protective clothing and equipment. - Control of sales of banned pesticides. -Monitor residues of agrochemicals in crops and groundwater; test heavy metal contamination of soils and irrigation water periodically, especially downstream of polluting industries (air and water sources). -Promote healthier food habits and nutrition education.

Table 4: Integrating UPA processing and marketing in sectoral policies and plans

Type of policies	Strategic interventions
Agriculture policies	<ul style="list-style-type: none"> - Provide training and technical assistance in: food processing, value addition and enterprise management, business management and marketing. - Support for infrastructure development (e.g. storage spaces, packaging sheds, marketing stalls). - Encourage the formation of groups and associations of informal food operators and/or reinforce existing groups. -Provide start-up licenses and subsidies (or tax reductions), technical and management assistance to cooperative and individual small scale agro-processing and packaging enterprises and enterprises supplying ecological farm inputs (compost, earthworms, open pollinated seeds and plant materials, bio-pesticides) to urban producers. - Enhance access to credit and financing to transporters, processors and traders for better access to inputs, processing, transport and storage facilities. -Promote private sector investment in food supply and distribution systems.
SME and Marketing policies	<ul style="list-style-type: none"> -Facilitate marketing of food products including direct marketing by: <ul style="list-style-type: none"> -Assisting in the creation of new or rehabilitating existing local food and farmers' markets (infrastructure development, licenses, control of product quality). - Establishing community food cooperatives and shops entailing buying nutritious food in bulk to enhance local sales, as well as providing better food access and lower prices. - Authorising food box schemes and/or supporting the establishment of "green labels" for ecologically grown and safe urban food. - Preferential municipal procurement of agricultural products from urban farmer groups to supply schools, community kitchens, hospitals and other service organisations. -Enhance the provision of timely market information to stakeholders. -Provide clean water and sanitation at processing points and markets. -Invest in transport, market and storage infrastructure to facilitate marketing of food at reasonable costs -Apply taxes and levies on food imports.
Land use policies and plans	<ul style="list-style-type: none"> -Provide appropriate areas and space for parking, produce (un)loading and for the sale of food. -Integrate informal markets in land use planning.
Environmental policies	<ul style="list-style-type: none"> -Ensure proper management of waste from processing industry and markets.
Health policies	<ul style="list-style-type: none"> -Educate people involved in food processing, street vending, transport and marketing of fresh produce on sanitation and health aspects. - Promote hygiene and safer vegetable processing. -Enforce food safety regulations.

3. A strategy for regional food systems, balancing rural and urban food supply

The "urban food/t-print" of Kampala, Nairobi, Addis, Dar es Salaam, Antananarivo, as well as those of secondary cities, stretches far beyond city boundaries. Local and regional food production and distribution policies (as discussed for the Nairobi Metropolitan Region) are crucial in this respect. With the continued growth of its largest cities, the "urban development corridor" as well as "the metropolitan region" are now emerging spatial phenomena in Africa. Urban corridors (often linear or ribbon shaped) are urban and semi-urban systems structured along the major economic arteries of agglomerations. They incorporate urban fabric, industrial plants and rural lands in the sphere of influence of a dominant urban core (UN-HABITAT 2008). Metropolitan urban regions also connect various larger and smaller urban areas though are often more circular or amoeba-like shaped.

A large variety of concepts and definitions exist when it comes to using the term "regional food system", "metropolitan food system" or "urban and local food systems". In this paper we talk about regional food systems using the spatial concept of metropolitan urban regions or urban corridors as outlined above. Regional food systems in this context can thus be defined as the complex relation of actors, relations and processes related to food production and consumption in a given geographical region that includes one or main and smaller urban centres and surrounding peri-urban and rural areas that have strong linkages with the urban centres as far as food marketing and consumption is concerned.

Whereas until recently central and local governments were the main political and economic powers, the emerging third, regional level may offer the best future opportunities for spatial interventions to become a tool of social and economic policy, addressing urban and rural poverty and food insecurity (UN-HABITAT, 2008). Nairobi Metropolitan and the Greater Antananarivo Region are good examples calling for control of unrestricted growth in peri-urban areas and preservation of areas of agricultural land for food production, employment creation and environmental management; while agriculture and food production and supply in the quickly urbanising corridor between Kampala and Entebbe may also best be protected and enhanced if a regional vision for development was established.

Questions that metropolitan regions and urban planners should ask include: “*is the food supply sub-system able to satisfy the urban demand for food now and ten years from now?*” and therefore “*how much urban and peri-urban land should be preserved for agriculture (and livestock) production for future urban demand for food?*”; “*are existing markets, processing and storage facilities efficiently located?*”; “*are (transport) conditions in place to facilitate quick and safe urban food distribution at the lowest possible cost and under the most hygienic conditions?*” and more broadly “*are urban food distribution activities in line with future expansion of the urban and metropolitan areas?*” (adapted from Argenti and Marocchino, 2005; Argenti, Pers. Comm. 7 December 2010).

Regional food systems will play an important role in balancing and linking urban and rural food supply. A growing body of evidence supports the geographic and economic complementarity between rural and urban production in their contributions to urban food supply (see the review of available studies by Moustier and Danso, 2006). This complementarity should also take into account that in reality rural to urban farming systems exist in a continuum with multiple types of flows and interactions between them. Part of the reasons for the growth in and growing attention for UPA is due to its adaptability and mobility compared with rural agriculture. It is essential to define in which cases UPA has a clear comparative advantage over rural agriculture. Such comparative advantage exists when UPA can better serve the urban market by supplying products otherwise unavailable or at a lower cost. As a result of its proximity, UPA has de facto shortened the food chain, allowing for savings in transport and other post-harvest expenses. In places where rural infrastructure is poor or where farm-to-market systems are inadequate, where seasonal rural production is hampered by climatic conditions, UPA can fill critical gaps. UPA should concentrate on those activities in which it has such comparative advantage, such as the production of fresh, perishable foods and the production of foods that can be grown under space-intensive conditions (vegetables, small animals).

Moustier (1999) makes the point that even for the poorest urban households, own food production will provide a supply for specific periods of the year and will cover specific products; the households will depend on urban markets (supplied by rural systems for many products – see below) for the remainder of their food needs. In a study from Antananarivo, for example, whilst half of the households interviewed produced vegetables, only for 25% of them had more than one month of supply.

The relative contribution to urban markets by UPA and rural agriculture is highly variable depending on type of product and seasonality. Table 5 which shows the origin of different food items sold/consumed in Kumasi indicates the importance of UPA for the supply of lettuce, eggplant, spring onions and tomatoes. Moustier and David (1997, cited in Moustier 1999) also show the particular importance of UPA for supplying leafy vegetables (e.g. 80% of Brazzaville’s supply; 100% for Bangui; and 90% pour Bissau and Antananarivo). For other vegetables the supply from rural areas is critical: onion and potatoes (which represent more than $\frac{3}{4}$ of the flows of vegetables into the city) are produced in specialist rural systems, but even perishable crops, such as tomato, are supplied in significant amounts from rural areas (e.g. 80% of tomato in Brazzaville, 60% in Bangui and 50% in Bissau is transported from areas at 50 km from the city). Perishable produce thus may be transported over large distances, in spite of poor road infrastructure conditions. The Jos Plateau, with its favourable climatic conditions, plentiful water for irrigation, and central location in Nigeria, is an unusual example of dry-season horticultural production through UPA becoming a major supplier of urban markets all over Nigeria and beyond (Pasquini *et al.*, 2004), covering distances of over 800 km.

In terms of seasonal flows, the relative importance of UPA and rural agriculture flows will vary in different situations. In Bangui for example, tomato supply from rural areas increased from 40 to 50% between the dry and the wet season, because access to areas that do not flood is easier in a rural context (David 1992, cited in Moustier, 1999). In the case of Nouakchott rural production contributes more than UPA in terms of supply (20,000 tons vs. 6,000 tons), however, UPA supplies the city for a longer period (9 months vs. only 3 for rural production) (Margiotta, 1997, cited in Moustier, 1999). Temple and Moustier (2004) note that UPA supply of vegetables in Yaoundé, Dakar and Cotonou, whilst it does not fully meet city demands, is more continuous and dependable than rural supply because of access to irrigation.

Table 5. Origin of different Food Items Sold/Consumed in Kumasi, Ghana

Food items	Metropolitan area (source %)	Peri-urban Kumasi (source %)	Rural and import (source %)
Cassava	10	40	50
Yam	0	0	100
Rice	0	<5	95
Lettuce	90	10	0
Tomatoes	0	60	40
Eggplant	0	60	40
Onions	0	0	100
Spring onions	90	<10	0

Source: Moustier and Danso (2006)

It is likely that UPA will continue to offer a comparative advantage over rural farming for products such as green leafy vegetables, with very short shelf life, because of shorter marketing chains and lower transport and cooling costs. Moustier and Danso (2006) note that freshness of vegetables is an important criterion for consumers who do not own refrigerators, and that as the leafy vegetables commonly consumed in Africa (e.g. amaranth, sorrel, morel, cabbage, lettuce, chives) deteriorate after one day, they tend to be transported from locations less than 30 km from city centres, and make up more than 70% of supply.

UPA also offers advantages in terms of decreasing the likelihood of producers cheating customers on product quality, since relational proximity enables more frequent contact between producers, traders and consumers. This is an important safeguard in settings where there are deficiencies in terms of public control of quality (Moustier and Danso, 2006). The marketing of “safe” or organic UPA produce in Asian cities such as Hanoi and Phnom Penh has developed from the direct relationships built between farmers and consumers (Moustier, 2007). Various studies have noted that also in East Africa consumers are increasingly concerned about the health effects of pesticides and inorganic fertilisers, which is stimulating a local market for organic produce, including horticultural crops, and which is increasingly being catered for by supermarkets (e.g. this is reported for main cities in Tanzania, Kenya and Uganda by Taylor, n/d; Weinberger and Msuya, 2004, also found that in Tanzania urban consumers frequently held the belief that indigenous vegetables were healthier than exotic vegetables because they were produced under a lower fertiliser and pesticide regime).

The understanding of the specific role of UPA in urban horticultural supply is limited by the lack of disaggregated data (Ambrose-Oji, 2009). Furthermore, as Moustier and Danso (2006) point out, comparing yearly UPA production to available consumptions statistics only offers a partial understanding of the role played by UPA as it misses seasonality issues, and does not consider the final destination of products (UPA products may not be destined to local consumption, but may be exported internationally, or nationally, as the example of the Jos Plateau mentioned earlier strikingly illustrates). Thus, gaining a detailed appreciation of these contributions will require surveys in wholesale and retail markets, which include questions on the origin and quantities of products traded, at different times of year, so that issues of seasonality are better understood. The authors further emphasise the need for comparative economic analyses focused on the entire supply chain, that also evaluate the economic impact of successful marketing strategies by farmers including quality promotion. It should be noted that available data for the sub-Saharan African context are also mostly out of date. Generally, the examples discussed above were undertaken in the early 1990s (Moustier, 2007) and rapid urbanisation can change food flows quite significantly (Falletti, Pers. Comm. 06 December 2010).

Indigenous or traditional vegetables¹⁵ deserve much more explicit attention. Most market supply chain studies have focused on exotic¹⁶ vegetables, overlooking the significance of indigenous vegetables. Nevertheless, these can constitute a very significant market, as a recent survey evaluating volume and turnover of the three most important indigenous vegetables produced through UPA in two cities each in Kenya (158 retailers), Tanzania (179 retailers) and Uganda (153 retailers) has revealed: in Kenya the total volume traded was 4,284,120 kg contributing to a total turnover of US\$ 1,900,007; in Tanzania 1,986,760 kg were traded for a turnover of US\$451,789; and in Uganda 582,338 kg were traded for US\$ 179,884 (Weinberger and Pichop, 2009). Based on these figures, and also data for three West African countries and South Africa, the authors estimate that the market for African indigenous vegetables (AIVs) in sub-Saharan Africa is worth billions of US dollars.

Enhancing the role of AIVs in urban food systems would offer significant benefits. As summarized in Shackleton *et al.* (2009) there is a considerable diversity of AIVs (which greatly surpass that of exotic vegetables) whose benefits have yet to be tapped into; AIVs are an integral component of livelihoods throughout the African continent; there are several popular AIVs with better nutrient and vitamin levels than exotic vegetables; and currently women play a strong role in the production and/or marketing of AIVs. Other important considerations which derive from more limited studies (i.e. studies that are focused on just a few species or just a single region, and which therefore need further supporting evidence before they can be generalized) include: the suitability of AIVs for resource-poor farmers since reasonable yields can be obtained with lower inputs and because of their adaptability to local conditions; the significant potential in terms of climate change adaptation because of the genetic and species diversity; the presence in urban markets of significant amounts of AIVs sourced from UPA, but also of significant flows from rural areas of select cultivated and particularly wild species; the willingness of consumers shopping in formal markets and supermarkets to buy AIVs (as is the case in Kenya); the decline in popularity amongst urban consumers for specific AIVs, particularly those which require lengthy preparation; the dominance of men in production systems where AIV production is a very profitable activity and women's access to land is traditionally very limited (Shackleton *et al.*, 2009).

In conclusion, the development of policies to strengthen **endogenous** urban horticultural supply systems, rather than relying on imports, food aid, and exotic foods, will therefore need a careful evaluation of the comparative advantages of UPA and rural systems at the regional scale, with express attention to how differing production conditions along the rural-urban continuum can be exploited to maximum advantage to stabilise supply of a diverse range of horticultural products, across seasons. Policy interventions are also urgently needed to improve the functioning of horticultural supply chains and food distribution systems. Sustainable regional food systems thus will require a systemic view of how cities are fed, and have to be based on the understanding that what matters is the efficiency and dynamism of the **whole** food supply and distribution system, not on the performance of certain elements (Argenti, Pers. Comm., 2010). A sustainable regional food supply system would have the following characteristics (adapted from de Zeeuw, 2009):

- **Proximate:** food consumed in the region originates from the nearest source (to minimize energy use in transport, cooling, etcetera); interactions between farmers and market agents, farmers and consumers, and also within the farming community itself are promoted;
- **Accessible:** nutritious food is accessible for all both in terms of geographic access and affordability;
- **Resilient:** leading to a high level of regional food security and resilience to shocks (supply problems, economic crisis, climate change);

¹⁵ Following Ambrose-Oji (2009) these include plants that have originated on the African continent or which have such a long history of cultivation and domestication that they have become "indigenized" to local conditions. Important indigenous vegetables include okra (*Abelmoschus esculentus*), sweet potato (*Ipomoea batatas*), amaranth (*Amaranthus* spp.), jute mallow (*Corchorus olitorius*), spider plant (*Cleome gynandra*).

¹⁶ Exotic vegetables would include lettuce (*Lactuca sativa*), carrot (*Daucus carota*), tomato (*Lycopersicon esculentum* var.), onion (*Allium* spp.), cabbage (*Brassica oleracea*) etc.

- **Environmentally-friendly:** adequate use of the natural resources, reduced use of chemical pesticides and fertilizers, low energy use, high water efficiency, application of ecological production methods, reuse of urban wastes/nutrients/water as a productive resource;
- **Pro-poor:** enhancing participation of small scale producers, processors and sellers as well as urban poor consumers in the food system;
- **Embedded in the regional culture(s):** building on and strengthening local knowledge, understanding of food/nutrition and food habits as part of regional culture and identity;
- **Efficient:** being complementary to seasonal flows of production from rural areas and considering production and marketing opportunities and species selection in both rural and urban settings;
- **Economically sustainable:** with government and private investment supporting small scale farming and processing to be competitive, while also enabling innovation and investment.

4. Strategies for coordination of support to urban food supply and regional food systems

From the evidence discussed above it can be safely concluded that both local and national governments in Eastern Africa are adopting new, though incipient, approaches to enhance more sustainable urban food supply and distribution systems. They have done so with support of local and international organizations, such as UN-HABITAT and FAO, the international network of Resource centres on Urban Agriculture and Food security (RUAF) and local, national and international research institutes, such as the CGIAR-Urban Harvest, the African Studies Centre and GlobalHort. Improved coordination of the work between these organizations is needed to enhance efficiency and help local and national governments to better respond to the challenges they face. The following activities and synergies are proposed¹⁷:

- **To enhance more systematic and data collection on the effects of city growth on urban food supply.** There is still a very substantial gap in knowledge concerning the impacts of urban growth on urban food systems. There are few solid estimates of how much (fresh) produce urban and peri-urban food production contributes to urban demand and what proportion of their vegetables, fruit (and other key products) the citizens get from this zone? More robust evidence is needed to guide policy –making. Data that are cited are generally old, not comparable because of unclear or different protocols, and used regularly without caution or verification. A great harmonization of protocols and actualization is needed, not only for UPA but to characterize informal horticulture in general. This could be a joint project to be implemented by academic, private and public sectors and international organisations that gather statistics on production or on nutrition (such as data from WHO on human health that use indicators to describe consumption of fruits and vegetables). Inclusion of urban food production, supply and distribution indicators could also be promoted in the Global Urban Observatory, the monitoring of the MDGs, and in standard FAO and World Bank surveys on urban poverty and urban food security.
- **To set up an international multi-stakeholder platform for dialogue on “city growth and urban food supply in Eastern Africa”** involving international organisations, national and regional representatives, experts on urban food supply issues from various knowledge centres, bilateral donors and representatives of civil society groups. The international platform will:
 - Act as a high level advisory panel to UN-FAO and UN-HABITAT;
 - Facilitate information exchange and coordination between various international organisations and actors;
 - Facilitate monitoring, documentation and systematisation of experiences gained in policies and programmes that seek to develop sustainable, safe and equitable urban and regional food systems;
 - List and document arguments to enable high value UPA to develop in and around cities in the region;
 - Stimulate increased international financial and technical support for UPA and act as a broker between southern initiatives in need of technical or financial support and southern or northern partners able to deliver such support.

¹⁷ Proposals made here build on earlier discussions and consultations held; see also UN-FAO and RUAF Foundation (2009)

- **To continue to take stock of and to systematize the various policies, programmes and laws and regulations** developed that bear on UPA and urban food supply, **monitor their implementation, outputs and impacts.** A common framework for systematisation and monitoring could be developed and agreed upon, with international and local organisations working in a specific locality being responsible for its implementation. Based on such (joint) analysis, further **support** (capacity development, technical assistance etc.) **to the development of specific national and local policies and programmes on UPA** should be given shape in collaboration with municipalities, civil society and private actors, as well as to the inclusion of urban food supply policies into food security and poverty reduction strategies and into sector policies and programmes. Based on its mandate, organisations like UN FAO are possibly best suited to do so at national level, while organisations like RUAF and Urban Harvest are best placed to work at local level. Collaboration is needed to allow for scaling up of effective local policies and for provision of national frameworks and policies that are facilitating local-level interventions.
- **To support inclusion of UPA into the agenda of national research, extension and educational programmes by:**
 - Assisting universities and technical colleges to integrate UPA into their curricula;
 - Training government staff, researchers and educators in technical, socio-economic, health, environmental, institutional and legal aspects of UPA;
 - Providing support for formulation and implementation of (action and policy oriented) adapted research on identified key issues in cooperation with local stakeholders. Important areas for action and policy oriented research on UPA are: (1) Better monitoring and analysis of the contributions of UPA to the local economy, social inclusion and poverty alleviation, urban food security and nutrition, urban environmental management and adaptation to climate change as well as the effects of alternative policies regarding UPA; (2) Better understanding of the trade-offs between UPA and other land uses in cities and effective ways to maintain open productive green spaces in the built up city; (3) (Participatory) research on safe and sustainable agricultural practices for small scale space-confined UPA; (4) Pathways used to adopt international policy guidelines at national and local levels and analysis of social and cultural factors influencing the position of UPA in municipal and national policy making;
 - Stimulating inter-city and inter-country exchanges on key themes. International as well as national and local research institutes and Universities have a key role to play, while active participation of researchers in national and local multi-stakeholder networks for planning and coordination of UPA development should also be pursued to improve the interaction with policy makers and other stakeholders, to be better informed about their priorities and working conditions, and to assist in evidence-based policy and programme formulation.
- **To better define and investigate the concept of regional food systems** from both geographic, social and economic points of view, in order to design optimal strategies taking into account well-balanced rural and urban development for the city supply in fresh produce. This includes more research on the complementarity and interaction between rural and urban food supply and food markets as well as on optimal governance structures for (new to be formed) metropolitan regions or urban corridors. Research organisations, UN-FAO and UN-HABITAT will be important stakeholders.
- **To identify and test innovative forms of financing for UPA**, including more research into the “climate gain” of UPA (in terms of reduced transport, soil carbon sequestration) and the possibility to include carbon financing for UPA in the Clean Development Mechanisms (CDM) programme or for carbon credits to be sold on voluntary markets. The Amman CDM will be the first pilot trial to test urban agriculture and forestry as part of their CDM programme. RUAF Foundation is discussing its support to Amman city and experiences could be documented and analysed together with the World Bank for eventual replication in other cities.

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Appendix 1. Benefits and risks of urban and peri-urban food production

Many urban poor have long practised urban and peri-urban agriculture (UPA) as a livelihood and survival strategy. UNDP (1996) defines urban agriculture as “*an industry that produces, processes and markets food and fuel, largely in response to daily demand of consumers within a town, city or metropolis, on land and water dispersed throughout the urban and peri-urban area, applying intensive production methods, using and recycling natural resources and urban wastes, to yield a diversity of crops and livestock*” (p 3). According to the same source, 68% of the urban dwellers in six Tanzanian cities are involved in urban agriculture. Lee-Smith (2010) refers to other data that report that 17% of households in Addis Ababa were involved in vegetable production in 1994, 36% of Dar es Salaam inhabitants were involved in crop production in 1995, 30-35% of urban residents practised urban crop production in Nakuru and Kisumu (Kenya) according to 1995-1998 data, while over 26% of urban households and 56% of peri-urban households in Kampala (Uganda) were found to practice some form of UPA in 2003. 2008 data show that for 18% of the population of Antananarivo farming constitutes its primary income source. (UN FAO, 2009). Despite the fact that these figures need to be validated and updated as economic conditions changed, they suggest an active (peri)urban household agriculture system that could provide good opportunities for intensification of production close to urban markets (Lee-Smith, 2010).

Benefits of UPA include:

- Urban households involved in UPA are generally **more food secure and benefit from a more diverse diet**. Studies reveal that in Nakuru, Morogoro and Mbeya (Tanzania) a household’s own urban agricultural production was among the most important food source for many poor (and even less poor) households (Foeken, 2008). Production of food (e.g. green vegetables, eggs, milk, and meat from small animals) by poor urban households can supply 20-60% of their total food consumption. They are also found to eat more vegetables than non-farming households (data cited in de Zeeuw and Dubbeling, 2009).
- Urban and peri-urban food production also helps increase the **availability of healthy and affordable food** for a larger number of urban consumers. In many cities UPA meets a substantial part of the urban demand for vegetables (especially fresh leafy vegetables), alongside other products (see Table 1). The volume of crops and animal products of UPA often represents a substantial part of the overall urban food needs, e.g. in Nakuru 8% and Kampala 40% (data cited in de Zeeuw and Dubbeling, 2009). Rice grown in urban and peri-urban areas around Antananarivo supplies ca. 15% of the urban demand (Aubry and Ramamonjisoa, 2007).

Table 1: Percentage of vegetables provided by (peri-)urban horticulture

City	Percentage of urban demand met by UPA	
	Leafy vegetables	All vegetables
Dakar, Senegal (Mbaye and Moustier, 2000)		70-80
Dar Es Salaam, Tanzania (Jacobi <i>et al.</i> , 2000)	90	
Addis Ababa, Ethiopia (Tegegne <i>et al.</i> , 2000)		30
Accra, Ghana (Cofie <i>et al.</i> , 2003)		90
Ibadán, Nigeria (Olajide-Taiwo, <i>et al.</i> 2009)	80	
Antananarivo, Madagascar (Moustier 1999; Aubry C. and J. Ramamonjisoa, 2007)	90-100%	80-090% (tomatoes, cauliflower, leek)

Source: Compiled by RUA Foundation

- UPA **improves access to fresh and nutritious food** for the urban poor not just by making it available at close proximity to cities but also by **reducing its cost**, as locally-produced food involves less intermediaries and less transport, cold storage, processing and packaging. The price differential between producer and final consumer (which may go up to 1:10 in rural agriculture) is lowered to 1:2 or 1:3 in UPA (Moustier and Danso, 2006).
- Due to their short cycle, horticultural crops provide a **quick response to emergency needs** for food (several species can be harvested 60 to 90 days after planting). Intensive horticulture can be practiced on small plots, making efficient use of limited water and land resources.

In order to assure that UPA contributes to improved urban food security, support in terms of access to land, technical guidance and training on good production practices, farmers and consumers' education is required. Additionally, potential health hazards caused by use of wastewater and agrochemicals, poor food handling and urban pollution should be reduced. Such risks need to be properly managed through appropriate accompanying measures. Urban and peri-urban producers need to be sensitized to the risks associated with poor hygiene, irrigation with untreated wastewater, improper use of organic solid wastes to fertilize soil, and the excessive use of pesticides. Food intermediaries, such as transport operators, middle men and market vendors, need to ensure proper conditions for transport and storage of food. Consumer education should stress the need to wash leafy vegetables with potable water to effectively reduce heavy metal contamination, and the use of disinfectants, such as chlorine, in reducing microbiological loads. Policy and regulatory measures, including enforcement, should go hand in hand with proper training of stakeholders and provision of facilities, e.g. for organic waste recycling and decentralized waste water treatment. (UN FAO, 2010). Other measures could include the testing of heavy metal contamination of soils and irrigation water periodically, especially downstream of polluting industries (air and water sources); maintaining a minimum distance of 30-100 meters between crop fields and main roads, and/or plant boundary non-food crops beside roads to reduce contamination of crops by lead and cadmium; educating farmers on proper management of agrochemicals; introduce cheap protective clothing and equipment; promoting ecological farming practices and replace chemical pest and disease control by integrated pest and disease management; monitoring the quality of irrigation water from rivers and wastewater outlets; certify safe production areas; restricting crop choice or production systems in areas where minimum water quality cannot be guaranteed; educating people involved in food processing, street vending, transport and marketing of fresh produce on sanitation and health aspects and providing clean water at processing points and markets. With adequate management, health risks can be reduced to acceptable levels in most cases (Boschio et al, 2007).

UPA, poverty alleviation and local economic development

Food production, processing and marketing also contributes to generating income and employment for many poor urban households. According to the World Bank (2007), intensive peri-urban horticultural and livestock rearing are extremely fast-growing sectors that employ many workers and produce high value-added products that yield reasonable incomes and returns. Income and employment are not only generated in production, but also in processing, marketing and agricultural input supply. Although the production levels and turnover of individual urban producers or vendors in many cases will be small, their high number in each city makes their overall contribution to the urban economy highly relevant. In 1997, in Dar es Salaam urban agriculture formed at least 60% of the informal sector and was the second largest urban employer (20%). In Kenya, it was estimated that urban agriculture produces 25.2 million kg of crops worth 4 million USD and 1.4 million livestock worth 17 million USD in 1985 (IDRC, 1994, cited by Caleri, 2006).

Income generated by the informal food sector is often equivalent to or higher than the official minimum wage. Table 2 summarises data from a number of studies regarding **net income generated** in (mainly peri-urban) irrigated open space vegetable production in a number of African cities, showing that monthly net farm income figures usually range between US\$ 30-70, but can go up to US\$ 200 or more. In the same countries, the minimum monthly wage is in the range of US\$ 20-40 indicating that urban irrigated vegetable production could indeed be a profitable business compared to other urban jobs and also compared to rural vegetable farming.

Table 2: Monthly net income from mixed vegetable farming with irrigation

City	Typical net monthly income in US\$ per farm	Net income per capita in this country
Accra, Ghana	40-57	27
Dar es Salaam, Tanzania	60	24
Kumasi, Ghana	35-160	27
Lagos, Nigeria	53-120	27
Lomé, Togo	30-300	26
Nairobi, Kenya	10-163	33

Source for data on West and East African countries: Drechsel et al, 2006

Urban agriculture, to a large extent, makes **productive use of land that is not fit for construction** (flood-prone areas, land under power lines and in buffer zones, land next to road sides and riverbanks) and adds value to land that might not otherwise have an economic output. It can generate income from temporarily idle land through urban and peri-urban infill, and is compatible with public parks and open space planning. However, questions are still raised regarding the sustainability of UPA in the context of a dynamic urban market with high competition for land, soaring land prices and largely uncontrolled urban growth, if not protected by municipal laws and programmes and combined with other functions like recreation, water management, urban greening and adaptation to climate change. Next to this, support to enterprise development, access to financing, markets, land and water) and strengthening technical and organisational skills of producers' organisations is required to enhance the sustainability of this sector.

Building more resilient cities

Building more resilient cities is a key issue for future urban development. City adaptation to climate change has become a growing concern. The World Meteorological Organization (2007) suggested more urban farming as a response to ongoing climate change and as a way to build more resilient cities.

UPA helps cities to become more resilient by:

- **Reducing the vulnerability of the most vulnerable urban groups** and strengthening community-based adaptive management by (a) diversifying urban food sources, enhancing access to nutritious food, reducing the dependency on imported and rural food supply; (b) diversifying income opportunities and functioning as a safety net in times of economic crisis; and (c) being a source of innovation and learning about new technologies for high land and water efficient food production.
- **Maintaining green open spaces and enhancing vegetation cover** in the city with important adaptive (and some mitigation) benefits by reducing impacts of high rainfall by storage of excess water, increased and increased infiltration in green open spaces; and maintaining biodiversity in the city, thus protecting a wider base of plant (and animal) genetic diversity (Santandreu *et al*, 2002).
- **Reducing energy use and green house gas emissions** by producing fresh food close to the city (less transport, cooling, storage, processing and packaging).
- **Decentralised (safe) reuse of wastewater and composted organic waste in UPA.**

In 1995, 31 countries were classified as water scarce or water stressed, and it is estimated that 48 will fall into these categories by 2025, affecting 2 billion people mainly in Asia and Africa (WHO, 2006). Meanwhile cities produce increasing quantities of wastewater that to a large extent is disposed in rivers, lakes or the sea, with important negative effects on public health and the urban ecology. Along with more efficient water use in agriculture, the productive use of recycled urban wastewater has been identified as a sustainable way to produce food for the growing cities. In most parts of SSA, UPA irrigated with polluted water sources contributes 60-100% of the perishable vegetables needed in most cities (IWMI, 2007). It is for these reasons that the WHO (2006) expects that "*urban agriculture, with urban wastewater as a common resource, will play a more important role in supplying food for the cities*". They indicate that a city of 1 million people would produce enough wastewater to irrigate approx. 1500-3500 hectares of land in a semi-arid country. In cases where treatment is not possible, WHO official guidelines acknowledge the use of untreated wastewater as long as sufficient risk reduction strategies are applied.

In addition to increasing quantities of wastewater, the quantity of **solid organic waste** produced by the cities is increasing dramatically. On average, 0.6 kg of solid waste is produced per city inhabitant/per day, 50-70% of which is made up of organic matter in low-income countries (Asomani-Boateng and Haight, 1999). Most of the organic waste that is currently collected goes to landfill. Diverting solid organic waste from landfills by composting is one of the simplest ways to prevent emissions of methane and to reduce the pollution of groundwater due to leachates from the landfill. Mapping of organic solid waste flows in 2003–2004 in Nairobi showed that very little of the estimated 2,000 tonnes each of nitrogen and phosphorus and 3,700 tonnes of potassium (worth about US\$ 2 million per annum) was used, and then in an uncoordinated and largely informal way. Less than 1% of Nairobi's solid waste was processed by low-income groups making compost. The non-market systems were working quite well, however, with a projected 54,500 households in 2003 using compost they produced themselves (Lee-Smith, 2010).

Appendix 2. Support needs for urban and peri-urban horticulture production and distribution

Three main forms of urban and peri-urban horticulture production systems can be distinguished: (1) micro-farming in and around the house for purposes of home consumption and occasional sale or bartering of surplus; (2) small-scale commercial horticulture production generating employment and income; and (3) large-scale agro-enterprises offering a possible source of employment for urban poor labourers. Governments have to decide which systems to support as they each have specific support needs.

Micro-farming in and around the house/homestead for example requires provision of quality seeds/seedlings, compost, small tools and equipment; training and assistance regarding space-confined and low cost production practices, recycling of household wastes and collection and reuse of grey and rainwater; advice on crop choice and food preservation and food preparation with views on optimal nutritional benefits; and integrating micro-farming in urban planning and social housing projects. The municipality of Cape Town (South Africa) for example supplies those who wish to start gardening activities with a “start-up kit for survivalist gardeners”, consisting of a pickaxe, spade, rake, watering can, seeds and compost. The start-up kit is further supplemented by skills training and extension services. In Addis Ababa, support and extension institutions help develop and disseminate such technologies with and to small-scale urban farmers. Cities like Kampala and Dar es Salaam have been experimenting with the inclusion of space for home and/or community gardening in new public housing projects and slum-upgrading schemes (Kitilla and Mlambo, 2001).

For **(small-scale) commercial horticulture production**, taking place on larger open urban spaces or in peri-urban areas, the main support needs include: (1) technical training and assistance to producers, promoting year round production by provision of irrigation water and/or production under cover; introduction of high yielding varieties; (2) assistance for farmers’ organizations, quality control, certification, transport and marketing; (3) enhancing medium-term land security; and (4) access to credit and financing. The city of Bulawayo (Zimbabwe) for example provides treated wastewater (plus training on its use) to poor producers operating in a peri-urban scheme. The city of Pretoria, South Africa, entered into a partnership with producers to manage municipal open green spaces (saving the municipality considerable maintenance costs) by combining community gardening with other functions (e.g. park maintenance and recreational services). The city of Ndola (Zambia) is encouraging existing credit institutions to establish special credit schemes for urban agriculture-related enterprises, by creating a guarantee fund. The inclusion of urban agriculture in the municipal budget or national budget is also an essential component in the promotion of urban agriculture activities (Dubbeling *et al*, 2010).

Large-scale agro-enterprises require support with regards to access to information on advanced technologies and technical assistance to enhance sustainability and improve profitability (e.g. organic production); and access to market information (for local, national and export markets) and sources of financing.

Specialised horticulture processors, handlers and vendors need technical training in food handling, processing, quality control, business management and financial administration. Municipalities and local support organizations should also facilitate enterprise development and marketing by small urban producers. In the 1990’s, the Sustainable Dar es Salaam programme formed a working group on the small trading sector to integrate them in the city economy. The programme set up a small fruit and vegetable market in a designated area in the city centre. It regularised street vending and helped vendors form an association that now enjoys the use of a trading area (UN-FAO 2003).

Implementation of all these support strategies requires a facilitating policy framework at both national as well as city government level.

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