

Urban Agriculture

For Sustainable Poverty Alleviation and Food Security

Abstract

The paper provides an updated insight on the role that urban agriculture can play in pursuing the Millennium Development Goals and more specifically MDG 1 and 7, related to poverty reduction, food security, and environmental sustainability. Reference is made to urban agriculture in relation to the recent and important issues affecting the world economy and the environment, regarding climate change, soaring food and energy prices. It intends to raise awareness and inform decision makers and planners of the different aspects of urban agriculture, which entails a broad range of activities, related to the food production and distribution chain, within natural resources planning and use including urban and peri-urban forestry. The paper further illustrates ongoing initiatives that substantiate how UPA can, in different environments, play its role as a source of employment, income and food which are the indicators towards poverty reduction and improved food security. Without being exhaustive, reference is made to major key players and stakeholders that are committed and involved in advocating and promoting UPA as a key area of agriculture policy and sustainable development strategies. The paper intends to provide the necessary background that would facilitate further initiatives and recognize UPA as a means to improve the livelihoods of the urban poor.



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Foreword

This position paper on Urban and Peri-Urban Agriculture (UPA) for sustainable poverty alleviation and food security has been compiled as a means to enhance the awareness regarding the potential role and opportunities of UPA to improving food security and reducing poverty. It is intended to help both organizations, the World Bank and FAO, in conjunction with their development partners to promote UPA related programs and projects in the context of the MDGs and more specifically MDG1 “Eradicate extreme poverty and hunger” and MDG7 “Ensure environmental sustainability”.

Daniel Hoornweg

Lead Urban Specialist Cities and Climate Change, Sustainable Development, World Bank

Paul Munro-Faure

Chairman of the FAO Food for the cities multi-disciplinary group

Acknowledgement

The preparation of this paper was coordinated by Wilfried Baudoin and Axel Drescher within the framework of FAO's Food for the cities multi-disciplinary initiative. The authors would like to acknowledge the contributions of Florence Egal, AGND (Household food security, nutrition and livelihoods; co-secretary Food for Cities), Edward Seidler, AGSF (marketing and food supply); Ake Olofsson, AGSF (micro-finance); Catherine Bessy, AGNS (food safety); Alison Hodder, AGPC (Urban and Peri-Urban Horticulture); Yota Nicolarea CONSLEG (legal aspects); Barbara Ekwall, and Margret Vidar, ESAD (Right to food) Alberto Zezza, ESAF (data on UPA in selected countries); David Marshall, and Ricardo Sibrian, ESSG (SOFI data); Michelle Gauthier, FOMC (urban forestry, agro-forestry and land use); Francesca Gianfelici, NRLA (MDGs and formatting); Sasha Koo-Oshima, NRLW (water resource management and contribution to the editing); Paola Castelgrande, TCAP (Decentralized Cooperation Programme); as well as Juan Izquierdo and Sara Granados FAORLC (Latin America and the Caribbean); and, Modeste Kinane, FAORAF (Sub Saharan Africa). The paper has incorporated and built upon the knowledge and experience gained by FAO in the last ten years within both its field and normative programs. It has also extensively drawn on the information released by other agencies, and international partner organizations e.g. Vanessa Candeias, WHO (healthy diets), Luc Mougeot, IDRC (recommendations for policy), Rene van Veenhuizen, RUAF (policy impact), Gordon Prain and team, CIP - Urban Harvest, Cecilia Castro, Alain Santandreu and Gunther Merzthal, IPES (Latin America experiences), Pay Drechsel, IWMI (food crisis and UPA), Thomas Baeford Randrup, Danish Centre for Forest, Landscape and Planning (KVL) of the University of Copenhagen, and Fabio Salbitano, University of Florence (urban forestry and greening issues), whose comments and insights are gratefully acknowledged.

The continuous interaction and consultation process with Daniel Hoornweg and Jessica Wurwarg from the World Bank are greatly appreciated. Their contributions have been critical and essential to reach the final structure and enriching the content of the paper.

The paper has been further illustrated on behalf of FAO by courtesy of Wilfried Baudoin.

List of acronyms

AREX	Department of Agricultural Research & Extension services, University of Zimbabwe
BCC	Brisbane City Council
BVGF	Bundesverband der Gartenfreunde e.V.
CFF	Cities Farming for the Future Program
CGIAR	Consultative Group of International Agricultural Research
CIP	International Potato Centre
CIRAD	Centre International de Recherche pour le Development
COAG	FAO Committee on Agriculture
CPV	Consumer Price Index Variation
CSOs	Community Based Organizations
DRM	Disaster Risk Management
ECLAC	Economic Commission for Latin America
ENDA	Environmental Development Action in the third world
ENY	East New York
EUFORIC	European Urban Forestry Research and Information Centre
FAO	Food and Agriculture Organization of the United Nations
FCIT	Food for the cities multi-disciplinary group
FFS	Farmers' Field School
HH	HouseHold
HLC	High Level Conference
IBRD	International Bank for Reconstruction and Development
ICRAF	International Council for Research in Agroforestry
IDPs	Internally Displaced Persons
IDRC	International Development Research Centre, Canada
IDWG-FFC	Inter-departmental Working Group - Food for the cities
IFPRI	International Food Policy Research Institute
IPES	Promotion for Sustainable Development
IRDAS	Institute of Resources Development & Social Management
IRIN	Humanitarian news and analysis, UN Office for the Coordination of Humanitarian Affairs
IWMI	International Water Management Institute
IWRM	Integrated Water Resources Management
LAC	Latin America and the Caribbean
MDGs	Millennium Development Goals
MCP	Municipal Consultation Platform
NGO	Non Governmental Organisations
NY	New York
PAHO	Pan American Health Organization
PU	Peri-urban
RUAF	Resource Centre for Urban Agriculture and Food Security
SPFS	Special Programme Food Security
SSA	Sub-Saharan Africa
SUDP	Strategic Urban Development Plan
U	Urban
UG	Urban Greening
UK	United Kingdom
UN	United Nations
UNCED (Agenda 21)	United Nations Department of Economic and Social Affairs, Division for Sustainable Development
UNCHS-Habitat	United Nations Centre for Human Settlements
UNEP	United Nations Environment Programme
UNFCC	United Nations Framework Convention on Climate Change

UNFPA	United Nations Population Fund
UNS	United Nations Secretariat
UPA	Urban and Peri-Urban Agriculture
UPF	Urban and Peri-Urban Forestry
UPFG	Urban and Peri-Urban Forestry and Greening
UPH	Urban and Peri-Urban Horticulture
USA	United States of America
WB	World Bank
WFP	World Food Programme of the United Nations
WHO	World Health Organization of the United Nations
WMO	World Meteorological Organization
WW II	Second World War

1. Introduction

By 2020 the developing countries of Africa, Asia, and Latin America will be home to some 75% of all urban dwellers, and to eight of the anticipated nine mega-cities with populations in excess of 20 million. Most cities in developing countries have great difficulties coping with this development and are unable to create sufficient formal employment opportunities for the poor. They also have increasing problems with the disposal of urban wastes and waste water and maintaining air and river water quality. It is expected that by 2020, 85% of the poor in Latin America, and about 40-45% of the poor in Africa and Asia will be concentrated in towns and cities. The rapid urbanization goes together with a rapid increase in urban poverty and urban food insecurity. Poverty, hunger and food insecurity have human rights implications. Indeed, it is now widely accepted that poverty should not be seen only as a lack of income, but also as a deprivation of human rights and that hunger constitutes a violation of the human right to food.

2008 will be the first year in history that the world's urban population – more than three billion people - exceeds the number of those living in rural areas. Currently, one third of city dwellers, one billion people, live in slums. In many cities of sub-Saharan Africa they account for three quarters of all urban residents and in Latin America and Caribbean 60% of the poor (113 million people) live in cities. By 2030, some two thirds of the world's people will be living in cities, according to UN projections¹.

Sub-Saharan Africa (SSA) faces more development challenges than any other major region of the World. This region has a growing share of the world's absolute poor. In 1980, one out of every 10 poor people lived in SSA. In 2000, that ratio had risen to one in three. Future projections predict that soon it will be one in two, with increasing numbers of the poor living in urban areas in SSA, approximately 38 percent of the population currently lives in urban areas. By 2030, it is predicted that almost half (48.3 percent) of SSA's population will be urban. Most of these people will be living in slums, without access to adequate food, water, or sanitation. Urban poverty in SSA has a broader meaning of cumulative deprivation, characterized by squalid living conditions, risk to health and life from poor sanitation, air pollution, natural disasters, and the breakdown of traditional family and community safety-networks.

¹ http://www.citymayors.com/features/uscity_poverty.html

While there is a growing awareness about the role of urban agriculture in the context of food security and poverty alleviation for the urban populations, urban and peri-urban agriculture (UPA) still largely remains an informal sector that is not being integrated in agricultural policies or urban planning. This makes it vulnerable and also jeopardizes its sustainability. Urban and peri-urban agriculture contributes to local economic development, poverty alleviation, in recognition of the human right to food, the social inclusion of the urban poor and women in particular, as well as to the greening of the city and the productive reuse of urban wastes.

Policy decision and integration of UPA into development strategies are prerequisites to efficiency and long term sustainability of UPA programs, which need to address multi-sectoral and multi-disciplinary issues including crop and livestock production, aquaculture, agro-forestry in the overall context of proper natural resource management.

Rising food prices, has an ever more negative impact on the potential access to adequate food for the poorer sectors of the urban population.

With the urbanization process, urban and peri-urban agriculture has evolved from a simple, traditional and also informal activity into a commercial and professional initiative. UPA has become a key element in food security strategies. It was officially recognized by the 15th FAO-COAG session in Rome during January 1999 and subsequently at the World Food Summit in 2002.

Urban and peri-urban agriculture is an industry located within (intra-urban) or on the fringe (periurban) of a town, a city or a metropolis, which grows and raises, processes and distributes a diversity of agriculture products, using largely human, land and water resources, products and services found in and around that urban area.

According to the Report prepared for the UN MGDs² Committee, at mid point towards 2015, the achievement of the MDGs has been uneven, and we face nothing less than a development emergency. While many developing countries are on track to achieving a few of the Goals, large disparities exist across and within countries. On current trends, no African country is likely to achieve all of the goals. Countries emerging from conflicts or facing political instability pose particular challenge. In middle income countries, even where progress towards achieving the goals is more rapid, large pockets of inequality mean that millions of people continue to live in extreme poverty.

UPA addresses the three Global Goals that are targeted for as a result of the High Level Conference (HLC) on Food Security (FAO, Rome 3-5 June 2008), i.e. (i) sustainable increases in food production and availability, (ii) economic and social progress and (iii) sustainable management and use of natural resources. The HLC Declaration contains substantive issues on which Members had reached an agreement, including in particular the need to increase food production. The key to feeding the world today and tomorrow lies in increasing food production, particularly by small farmers in developing countries. This consensus, enshrined in the Declaration, confirmed the return of agriculture on the international development agenda after decades of neglect and ineffective policies.

Poverty and food insecurity have been considered for decades to be rural problems. Some analyses have shown however, that urban poverty is not only growing rapidly, but has tended to be underestimated in the past. Figures on levels of urban poverty for nations or for

² Background paper by the Secretary General of the UN to the High Level Conference on Food Security, Climate change, and energy – Rome, 3-5 June 2008

particular cities are much lower than the proportion of people living in very poor quality housing, lacking basic infrastructure or services. Vulnerable groups in cities often have fewer informal safety nets (kinship and community networks). Their dependence upon purchased food is further compounded by their incapacity to access and use natural resources to produce their food. Most authors on urban poverty agree that poverty is clearly becoming more urban.

Urban and peri-urban agriculture contributes to food security, nutrition and livelihoods in a combination of ways:

- providing for family self-consumption, thus contributing to healthy diet and allowing for saving on food expenditures
- providing a source of income, through sale of surplus or specialized and intensified commercial oriented production systems
- improving the supply of local markets with fresh and micronutrient rich foods at competitive prices
- ensuring a continuum of tree cover through landscape management and use of agroforestry systems, hedgerows and woodlots

UPA already provides a substantial contribution to the food for the cities in many countries. Yet, with the rapid growth of the urban population and the low nutritional levels of the urban and peri-urban poor, there is tremendous scope for increasing this source of supply. Benefits of UPA include:

- (i) Non-market access to fresh, nutritious food for poor consumers, and income generation (especially for women);
- (ii) Supply of urban food markets, street food and food processing, providing additional employment and income;
- (iii) Water harvesting, water re-use, and urban wastes re-cycling to provide water, animal feed and fertilizers for demands of UPA;
- (iv) Integrating UPA with urban greening (UG) programs, which can provide fuelwood for urban residents, reduce urban pollution and temperatures, and offer recreation opportunities to improve quality of life for all urban residents, and in particular for youth and elderly people;
- (vi) Providing an opportunity for participation of urban residents to benefit from the implementation of UPA/UG programs, specifically stimulating the involvement of women as complementary activity.

The intensification and extension of cities without taking into account the land-use capacity and the local need for woody building material and fuelwood, has contributed to a drastic depletion of tree and forest cover in and around cities. This is a common situation in developing countries and countries with economies in transition. Cities consequently suffer from floods, dust encroachment, water shortage, soil erosion and landslides associated to significant costs in terms of lost infrastructure and human death. The sustainability of agriculture in and around cities depends of the watershed and landscape management. Urban and Periurban Forestry brings the indispensable element of tree and forest cover to the benefit of the citizens.

2. Urban Agriculture in the context of achieving MDGs

Urban and peri-urban agriculture can directly and indirectly contribute in pursuing several of the MDGs. UPA's main direct contribution (over half of its effort) is to Goal 1, which combines the reduction of poverty and the reduction of hunger. A significant proportion (about one-fifth) is directed to Goal 7 concerning environmental sustainability. Smaller percentages of resources are directed to empowering women (Goal 3). There are important indirect effects on goals covering primary education (Goal 2), child mortality (Goal 4), maternal health (Goal 5), and combating diseases (Goal 6), generated primarily by work addressing reduction of hunger and malnutrition. Focusing on food security, nutrition and right to food in urban and peri-urban areas will help city-dwellers to attain a better livelihood. It will allow municipalities to broaden their strategy towards achieving the Millennium Development Goals.

Most of the poor developing countries are net food buyers. The recent price spikes are believed to have pushed over one hundred million more people into extreme poverty. According to UN Habitat, rapid urbanization has profoundly altered the distribution and face of poverty. As cities grow, so do the slum populations, for example more than 90% of urban growth in Kenya during 1990s was in slum areas. Slum dwellers, who presently account for 1 billion of the world wide urban population, are more likely to die earlier, experience more hunger and diseases, attend less education and have fewer chances of employment. Countries should adopt urban development policies including urban and peri-urban agriculture that will upgrade employment and income generating opportunities for the urban poor.

Even though the proportion of people in the world suffering from malnutrition and hunger has fallen since the early 1990, the number of people with insufficient access to food has risen. FAO's latest estimates show that even before the recent surge in food prices, worrisome long-term trends towards increasing hunger were already apparent. FAO estimates that 848 million people suffered from chronic hunger worldwide in 2003-05, representing an increase of six million from the nearly 842 million in 1990-92, the World Food Summit baseline period, against which progress is measured (Figure 1). With the number of chronically hungry people in the world now higher than during the baseline period, the World Food Summit target of reducing that number by half by the year 2015 may be more difficult to achieve (Figure 2 and Figure 4).

FIGURE 2: Number of undernourished people in the developing world (WFS target)

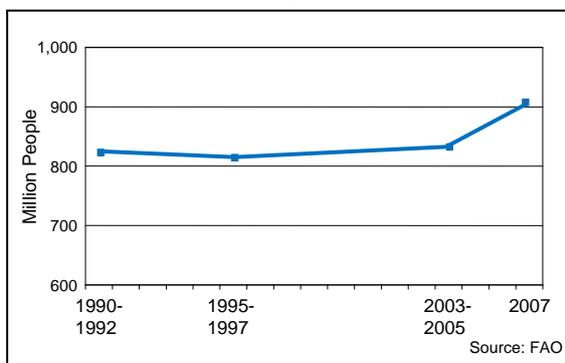
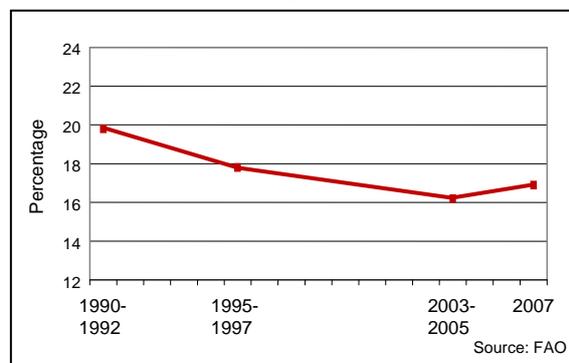


FIGURE 3: Proportion of undernourished people in the developing world (MDG target)



Most of the increase in undernourishment from the WFS benchmark period (1990-92) to 2003-05 took place in sub-Saharan Africa (Figure 4) where the absolute number (WFS

indicator) of hungry people increased by 43 million, from 169 million to 212 million. However, nearly three-quarters of this increase took place in the Democratic Republic of the Congo, where the number of hungry people rose from 11 million in 1990-92 to 43 million people in 2003-05, fuelled by widespread and persistent conflict³.

The impact of high food prices on hunger

Before the upsurge in food prices, FAO estimated that all four developing regions were making progress in reducing the prevalence of hunger from 1990-92 to 2003-05. However, from 2003-05 to 2007, progress has been reversed in every region, resulting in increased hunger prevalence for the entire developing world for the first time since the World Food Summit.

Provisional FAO estimates show that the number of undernourished people in 2007 increased by 75 million, over and above FAO's estimate of 848 million undernourished in 2003-05, with much of this increase attributed to high food prices. This brings the number of undernourished people worldwide to 923 million in 2007 (Figure 2). Given the continued and drastic increase in prices of staple cereals and oil crops well into the first quarter of 2008, the number of people suffering from chronic hunger is likely to have increased further.

Progress toward the MDG hunger target in the developing world had been steady from almost 20 percent in 1990-92 to less than 18 percent in 1995-97 and just above 16 percent in 2003-05. However, FAO's estimates for 2007 show that progress has since been reversed, with the proportion of hungry people in the developing world sliding back towards 17 percent, about the same level as a decade ago (Figure 3). Meeting the internationally agreed hunger-reduction goals in the few years remaining to 2015 is becoming an enormous challenge.

At regional level, the largest increases in the number of undernourished people as a result of rising food prices have taken place in Asia and in sub-Saharan Africa, the two regions, which combined, already accounted for 750 million, or 89 percent of the hungry people in the world in 2003-05. FAO estimates in 2007 that rising prices have plunged an additional 41 million people in Asia and 24 million in sub-Saharan Africa below the hunger threshold. Although the numbers affected are smaller, other regions have also seen increases in hunger as a result of rising food prices. In the case of Latin America, this represents a sharp reversal after more than a decade of steady progress towards the WFS goal.

[Source: FAO-ESSG September 2008]

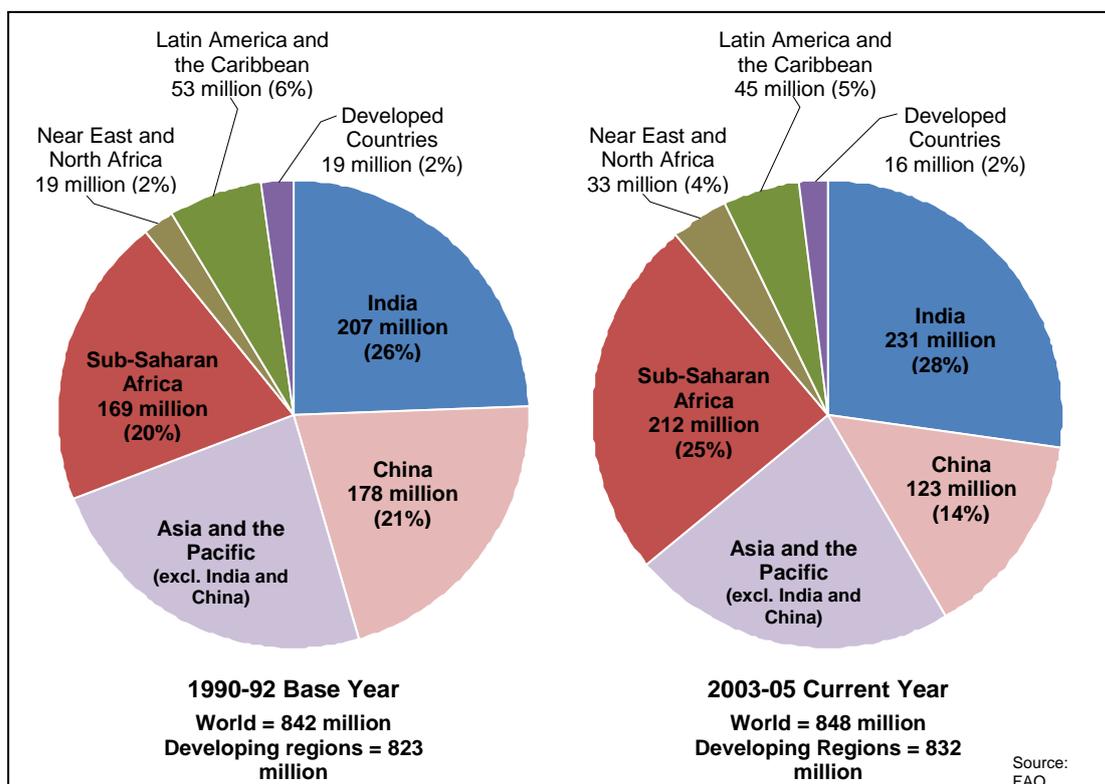
The rising food prices may actually bring some benefits for people living in the Pacific Islands, says a Pacific scientist. Dr Mary Taylor of the Secretariat of the Pacific Community believes the rising food prices will encourage people to grow their own food, reports Pacnews. Dr Taylor promotes crop diversity for the regional Institute, said the food crisis has a silver lining, which will encourage people to grow more of their own food and may change attitudes to traditional crops. "We have fewer options for feeding our people as 75 per cent of genetic diversity has been lost in the past century. Most people globally now rely on just 12 food crops and 14 animal species. "The rising cost of food is placing more value on the need to collect and share our plant materials. For example, an international plant centre in Hawaii has varieties of breadfruit trees that produce all year round," Dr Taylor said.

According to her, traditional food crops often viewed as inferior to imported processed food were likely to become more popular. "No country is self sufficient in crop diversity and access to overseas stocks is vital. For example, in Samoa a taro disease in the 1990s wiped out the entire industry, and taro only recovered when more resistant varieties were imported," Dr Taylor said. She suggested that one way to prepare for future changes was to join the 120 countries who had ratified the international treaty on plant genetic resources for food and agriculture this was making it easier for countries to collect and share plant materials under the treaties standard material transfer agreements.

[Copyright: The Fiji Times, 7 September, 2008]

³ From FAO-ESSG September 2008

Figure 4: Trends in global undernourishment, 2003-05 compared with 1990-92



Millennium Development Goals: 2007 Progress Chart, extract⁴

Goals and Targets	Africa		Asia				Oceania	Latin America & Caribbean	Commonwealth of Independent States	
	Northern	Sub-Saharan	Eastern	South-Eastern	Southern	Western			Europe	Asia
GOAL 1 Eradicate extreme poverty and hunger										
Reduce extreme poverty by half	low poverty	very high poverty	moderate poverty	moderate poverty	very high poverty	low poverty	---	moderate poverty	low poverty	low poverty
Reduce hunger by half	very low hunger	very high hunger	moderate hunger	moderate hunger	high hunger	moderate hunger	moderate hunger	moderate hunger	very low hunger	high hunger

The progress chart operates on two levels. The words in each box tell what the current rate of compliance with each target is. The colours show the trend, toward meeting the target by 2015 or not. See legend below:

- Target already met or very close to being met.
- Target is expected to be met by 2015 if prevailing trends persist, or the problem that this target is designed to address is not a serious concern in the region.
- Target is not expected to be met by 2015.
- No progress, or a deterioration or reversal.
- Insufficient data.

* The available data for maternal mortality and malaria do not allow a trend analysis. Progress in the chart has been assessed by the responsible agencies on the basis of proxy indicators.
 ** The assessment is based on a new methodology and therefore not comparable with previous assessments.

Country experiences in each region may differ significantly from the regional average.

For the regional groupings and country data, see mdgs.un.org.

Sources: United Nations, based on data and estimates provided by: Food and Agriculture Organization; Inter-Parliamentary Union; International Labour Organization; International Telecommunication Unit; UNESCO; UNICEF; World Health Organization; UNAIDS; UN-Habitat; World Bank – based on statistics available as of June 2007.

Compiled by: Statistics Division, UN DESA. Photo by: Adam Rogers/ UNCDF

⁴ An update of this graph will become available after official release of FAO SOFI 2008

3. Urban Agriculture

to improve food and nutrition security of the urban poor

... urban poverty tends to be fuelled by people migrating towards the cities in an attempt to escape the deprivations associated with rural livelihoods. Partly due to the rural decline, the world is urbanizing at a fast pace and it will not be long before a greater part of developing country populations is living in large cities. Therefore, urban food security and its related problems should also be placed high on the agenda in the years to come.

Jacques Diouf
FAO Director-General
[FAO: The State of Food Insecurity 2006]

Until recently poverty was synonymous with rural conditions, but rapid urbanization, also due to migration from extreme events (conflict, natural disasters...) in many developing countries has given birth to a large class of urban poor. It is estimated that about one-quarter of the developing world's poor live in urban areas, but also that poverty is becoming more urban and that the poor are urbanizing faster than the population as a whole.

Poverty and food insecurity have been considered for decades to be rural problems. Some analyses have shown however, that urban poverty is not only growing rapidly, but has tended to be underestimated in the past. Figures on levels of urban poverty for nations or for particular cities are much lower than the proportion of people living in very poor quality housing, lacking basic infrastructure or services. Vulnerable groups in cities often have fewer informal safety nets (kinship and community networks). Their dependence upon purchased food is further compounded by their incapacity to access and use natural resources to produce their food. Most authors on urban poverty agree that poverty is clearly becoming more urban. Although cities have increasing concentrations of poor people; for most people, cities represent the best hope of escaping poverty.

Malnutrition in all its forms is a growing concern in cities. While there are certainly more foods available year round and more jobs and social services in urban areas, not everyone is able to benefit. A growing number of urban poor face a daily struggle to feed their families.

Disadvantaged urban households may have to devote an extremely high proportion of their disposable income to food, between 54 percent and 76 percent in Sub-Saharan capital cities. It is obvious that in this urban context, the higher the proportion of income spent on food by low socio-economic groups, the more precarious their food situation is likely to be, although food budget shares in different cities may not be directly comparable (FAO 2008, b).

In urban settings, lack of income translates more directly into lack of food than in rural settings. In all regions, urban and peri-urban agriculture is an activity in which the poor are disproportionately represented. Food production in the city is in many cases a response of the urban poor to inadequate, unreliable and irregular access to food, and the lack of purchasing power. Engagement in farming in urban areas has also been shown to be associated with greater dietary diversity in most countries (WHO, 2003).



It is therefore essential that appropriate strategies be put in place to ensure availability and affordability of safe and healthy foods, promoting the production of such foods in urban and peri-urban areas thus enhancing livelihoods of actors along the value chain. The contribution of urban and peri-urban agriculture to food security and healthy nutrition for the urban population is probably its most important asset.

Urban and peri-urban agriculture contributes to food security, nutrition and livelihoods in a combination of ways:

- providing for family self-consumption, thus contributing to healthy diet and allowing for saving on food expenditures
- providing a source of income, through sale of surplus or specialized and intensified commercial oriented production systems
- improving the supply of local markets with fresh and micronutrient rich foods at competitive prices.
- ensuring a continuum of tree cover through landscape management and use of agroforestry systems, hedgerows and woodlots.

Access to food in urban areas very much depends on the ability to generate income. In this context, governments should recognize the role played by UPA and street food in making food available to poor families in urban areas and in generating income for women. Small scale UPA activities are known to be very appealing for women because can be practiced as a part-time commitment combined with other numerous task related to the household and child care.

For example, micro-gardens systems are very popular since their cultivations require less physical effort as compared to conventional growing systems. While, women take advantage of the yields obtained in household gardens to diversify the family food intake resulting in healthier diets, they also obtain a regular income to sustain other expenses for food, education or clothing and health requirements.

UPA and women

Anecdotal evidence in cities around the world brings out additional outcomes and benefits of urban and peri-urban agriculture for women:

- In remote peripheral areas of Mexico city, women have switched to UPA activities from working all day in the city centre as domestic servants. This allows them to generate income and produce food for household consumption near their homes, while taking care of their children in the same time. Previously women would leave at 4.00 a.m and return late in the evening. Their children were left watching TV and often ended joining street gangs.
- In urban areas of *Cameroon*, women affected by HIV/AIDS raise and roast chicken to make a living. This involves less physical work than working in the field, saves time as activities are in the vicinity of their homes and is conducive to group organisation and empowerment, which are essential to deal with the disease and face discrimination
- Studies in Dakar, *Senegal*, have shown minimal returns of highly-successful micro-garden projects. The main reason for this success lies in the social networking between previously isolated housewives.



3. 1 Food security and right to food

Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life. In urban areas, the main constraints for the access to food for the household are of economic and physical nature. Food prices and household income are the two economic parameters, while distance, and costs of transport from and to markets, may represent physical constraints. Urban and peri-urban agriculture can favorably mitigate these constraints by making food and income available at household level.

Household food production in urban environments, covering a diversified range of food commodities (essentially fruits and vegetable crops, small livestock, dairy products, eggs, etc), will enrich the family food intake and provide for a healthier diet according to own culture and food preferences.

UPA offers an advantage because of producing locally instead of being dependent on world prices, which varies according to global markets speculation. This means that UPA is able to guarantee a minimum level of “food self sufficiency”, especially for the poor with low purchasing power.

While food security is a technical definition and a political goal, the right to food is a human right⁵ that every person should enjoy by virtue of being human. The definitions of the right to food are similar to the definition of food security: Every human being everywhere should have the ability to produce or purchase safe, sufficient and nutritious food that is culturally acceptable, for an active, healthy and dignified life. A rights- based approach complements food security by recognizing the existence of legal entitlement of rights holders and of legal obligations of duty bearers towards the former. It is based on the value of human dignity and makes the individual an agent of change in a way that enables him or her to hold governments accountable and to seek redress for violations of his or her rights. The rights-based approach to food security is also reflected in FAO’s Strategic Framework 2000-2015 which stipulates that the Organization is expected to take into full account “progress made in further developing a rights-based approach to food security” in carrying out its mission of “helping to build a food-secure world for present and future generations”.

What is a human rights-based approach to food security?

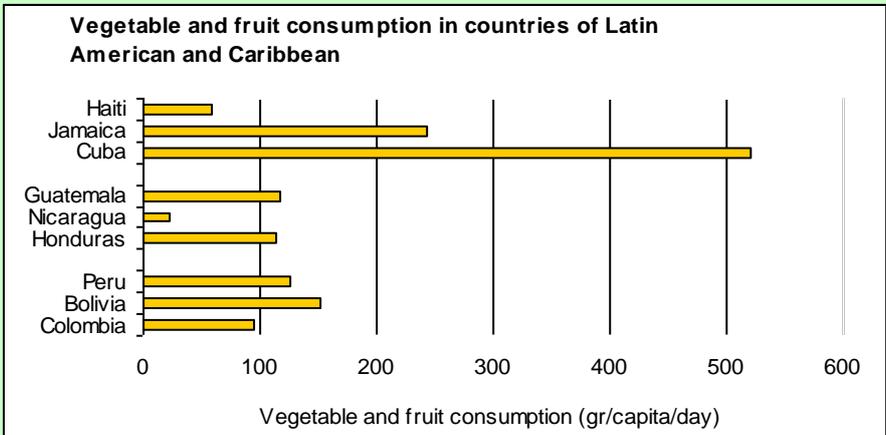
Just as human rights are regarded as being indivisible and interrelated, a rights based approach recognizes the interdependence and synergy between basic human rights such as food, water, health and education in development. The human rights based approach invokes binding human rights standards (e.g. “adequate” food in the case of the right to food) to be realized through a process which has to adhere to fundamental human rights principles such as participation, accountability, non-discrimination, transparency, human dignity, empowerment and the rule of law. Such process related approaches are viewed as complementary to market forces which often fail to enhance the welfare of the marginalized, poor and hungry people.

⁵ The right to adequate food is recognized under Article 25 of the Universal Declaration of Human Rights (G.A. Res. 217 A (III), U.N. Doc. A/810, at 71 (1948)), and under Article 11 of the International Covenant on Economic, Social and Cultural Rights (adopted on 16 December 1966, G.A. Res. 2200(XXII), U.N. GAOR, 21st sess., Supp. No. 16, U.S. Doc. A/6316 (1966), 993 UNTS 3), as interpreted by the Committee on Economic, Social and Cultural Rights (General Comment No. 12: The right to adequate food (1999), UN doc. E/C.12/1999/5). The *Voluntary Guidelines to Support the Progressive Realization of the Right to Adequate Food in the Context of National Food Security*, adopted by the FAO Council in November 2004, provide practical guidance addressed to all States for the implementation of the human right to adequate food.

3.2 Nutrition and healthy diet

In the World Health Report 2002, low fruit and vegetable (F&V) intake were among the 10 top selected risk factors for global mortality. A joint WHO/FAO report from an Expert Consultation on Diet, Nutrition and the Prevention of Chronic Disease recommended the intake of a minimum of 400g of F&V per day (146 kg/year, excluding potatoes and other starchy tubers) for the prevention of chronic diseases and for the prevention and alleviation of several micronutrient deficiencies, especially in developing countries. Current data shows that this goal is far from being met by most countries. Increasing consumption level should be addressed through adequate strategies linked to nutrition education and advocacy of benefits of fruits and vegetable consumption. This entails creating awareness starting from the future consumers, i.e. the school children and youth.

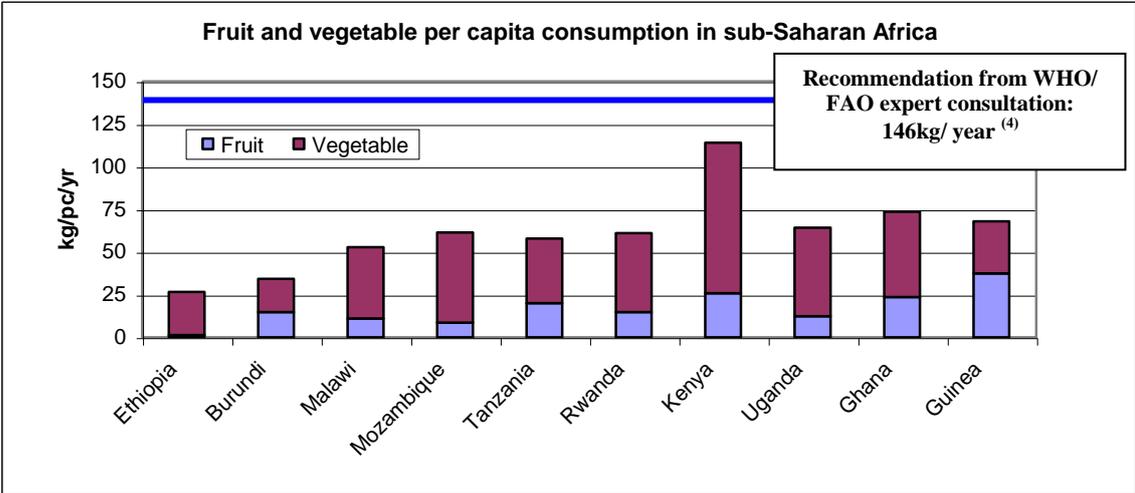
In LAC the average daily vegetable and fruit consumption (157 gr/capita/day) is well below the level recommended by WHO of 400 gr/capita/day. Cuba, as an example of high consumption is one of the countries with more advances in urban and peri-urban agriculture (UPA).



Source: FAO, 2005

The nutritional status of the urban population living in poor neighborhoods in Latin-America is low and is now aggravated by rising food prices.

A review by Ruel, Minot and Smith presented at the WHO/FAO Workshop on Fruit and Vegetables for Health (Kobe, Japan, 2004) analyzed the patterns of fruit and vegetable consumption in 10 countries of sub-Saharan Africa. The figure below summarizes these consumption patterns, ranked by ascending order of per capita gross domestic product in 2000. This is one of many examples that illustrate the low consumption of F&V in developing countries.



WHO and FAO have jointly co-sponsored various scientific meetings aiming at improving and sharing knowledge related to F&V for health, including the 2008 F&V Summit (Paris, France)⁶. Good nutrition is highly related to the capacity of cooking food. The access to energy is therefore integral part of nutrition strategies, although never indicated in the “pre-requisite” elements.



⁶ For further information on activities carried out by WHO as part the F&V initiative please check:
<http://www.who.int/dietphysicalactivity/fruit/en/index.html>

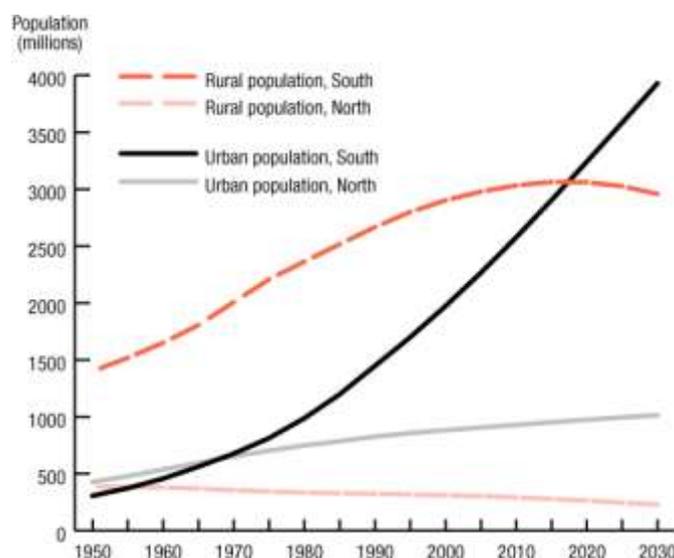
4. Urban agriculture: challenges and lessons learned

With the urbanization process, urban and peri-urban agriculture has evolved from a simple, traditional and also informal activity into a commercial and professional initiative. UPA has become a key element in food security strategies. It was officially recognized by the 15th FAO-COAG session in Rome during January 1999 and subsequently at the World Food Summit in 2002.

Urban and peri-urban agriculture is an industry located within (intra-urban) or on the fringe (periurban) of a town, a city or a metropolis, which grows and raises, processes and distributes a diversity of agriculture products, using largely human, land and water resources, products and services found in and around that urban area.

The phenomenon of urbanization brings severe challenges to ensuring household food security in a context characterized by high rates of unemployment, increasing development of the informal sector, deteriorating infrastructure, overcrowding and environmental degradation. In addition, cities should respond to increasing globalization; managing the process of decentralization; and providing basic services to the burgeoning urban poor, whose contribution to the economy is not usually matched by their access to basic services.

In most cases, urban residents in developing countries are increasingly exposed to the daily challenges, such as lack of safe water, inadequate sanitation and lack of environmental safeguards (air pollution, exposure to toxins and waste), and increased poverty and food insecurity. In most cities of the developing countries, urbanization has become virtually synonymous with slum growth. The slum population in these countries almost doubled in 15 years, reaching 200 million in 2005 (UNFPA, 2007).



Rural and urban populations in North and South, 1950 to 2030 (projected)

Source: UN (2004).

Tension has been especially high in the growing cities which depend on diminished supplies from rural areas and the global food market. With over 50 per cent of people in the world living in urban environments, urban food security has become a huge issue, especially in developing countries where infrastructure is poor and general poverty cannot accommodate increasing food prices. As a consequence of the current global food crisis, food riots occurred in Haiti and in at least 10 African countries during May and June 2008. Food aid can only be of short term nature aimed to buffer the current problems with food supply, but sustainable strategies are to be implemented as indicated in declarations by the World Bank' President and on occasion of the recent High Level Conference on World Food Security: the Challenges of Climate Change and Bio-energy held at FAO in Rome June 2008.

However, since the increase in food prices is not considered as a temporary phenomenon, but likely to persist in the medium term and affect the urban sector strongly, a number of measures have been suggested by the World Bank to address this problem on a global scale in the World Bank 10 Points Program. For the urban sector, self reliant food production, as enabled by UPA, is one of the measures suggested to lower the impact of this development, create access to food and enhance livelihood opportunities for poor urban dwellers.

Calling the worsening of the "world food crisis" a serious threat to the realization of the right to food for all, the UN Human Rights Council adopted by consensus a resolution affirming the importance of taking into account the right to adequate food, as recognized in international law.⁷ Indeed, developing responses to many of the challenges under the framework of the right to food would ensure that these responses would be better guided by the needs of the hungry and the malnourished. It would pave the way for targeting, but also for prioritization, coordination, accountability, and participation.

Many rural migrants, seeking better livelihoods in cities, have agricultural backgrounds and often end up participating in informal activities, such as urban and peri-urban agriculture (UPA). The United Nations Development Programme estimated in 1996 that 800 million people are engaged in urban and peri-urban agriculture world-wide. Of these, 200 million are considered to be market producers, employing 150 million people full-time. In African countries 40 per cent of urban dwellers are said to be engaged in some sort of agricultural activities and this percentage rises to 50 per cent in Latin American countries (see studies quoted in Ruel et al., 1998: p. 26).

UPA production is available both for self consumption and for sale and supply to the urban market. It is estimated (UNDP 1996; FAO 1999) that 200 million urban residents provide food for the market and 800 million urban dwellers are actively engaged in urban and peri-urban agriculture in one way or another. These urban farmers produce substantial amounts of food for urban consumers. A global estimate (data 1993) is that 15-20% of the world's food is produced in urban areas.

⁷ See <http://www2.ohchr.org/english/bodies/hrcouncil/specialsession/7/index.htm>

Mexico

Mexico City cultivates rise of 'backyard agriculture' By Adam Thomson in Mexico City

Led by Marcelo Ebrard, the city's left wing mayor, the local government has decided to expand a "Backyard Agriculture Program" launched last year to encourage the capital's residents to use all available space to grow crops. "We want to make people realize that they can use their gardens, yards and roof terraces to grow food," says Adolfo López Villanueva, the program's director. "With the climate we have in Mexico City you can get between two and three harvests a year and that would help families keep costs down." The program was launched last year. But the spiraling cost of food has given new impetus to plans for its expansion and this year officials have decided to increase its scope by at least 50 per cent. A parallel project, the Urban Agriculture Program, focuses on communities, encouraging them to make communal land available for more ambitious crops such as corn, a Mexican staple, and fruit. Mr López Villanueva said the target was to involve about 200,000 city residents in the medium term. Both programs were launched last year in the hope that adding a dose of agriculture could improve the city's notoriously poor air quality.

Mr López Villanueva is so optimistic about their prospects that he even believes that participating families could end up generating a surfeit of agricultural produce, which could give rise to farmer-style markets in the city.

[Copyright: The Financial Times Limited 2008]

4.1 Diversified productive activities in UPA

Important sectors of UPA include horticulture⁸, livestock, fodder and milk production, aquaculture, and agro-forestry. Urban and peri-urban agriculture is typically informal but wide spread, and often done under extremely difficult conditions. Urban and peri-urban agriculture may help to solve some of the problems of city authorities through integrated programs of waste water re-use and organic waste recycling, as well as through the integration of market wastes with urban fodder consumption (Drescher 2004).

UPA specializes on short cycle, high value and low input crops, essentially leafy vegetables that are highly perishable (amaranths; *pointe noire* (*Solanum nigrum*), ceylan spinach; oseille de Guinée (Roselle); cassava leaves) to gradually include fruit vegetables like Okra, Bitter ball (eggplant); cucumber, tomato and several fruit species also find their place in UPA (Papaya, Mango, Citrus, Rhamboutan,...) or in periurban agro-forestry and watershed management schemes, with due attention to non-wood forest products and the long-term cycle management of the tree-based food production system (e.g. agroforestry parklands in the Sahelian region; caterpillar, snails, grass cutters, and other wild animals for proteins from urban and periurban forests in Central Africa).

Fruit tree systems, woodlots and other tree-based systems can be implemented from 5 years and above, thanks to improved varieties or management techniques with due consideration for indigenous tree species, and provided that land and resources accessibility and tenure is secured on a long term. ICRAF has for instance developed techniques to grow dwarf baobab which allows access regular harvesting of baobab leaves in the gardens, reducing the pressure on the trees in the surrounding parkland.

What these diverse activities have in common is proximity to large settlements of people, thereby creating opportunities as well as risks.

The opportunities include:

- access to consumer markets;
- less need for packaging, storage and transportation of food;
- potential agricultural-related jobs and incomes;
- non-market access to food for poor consumers;
- availability of fresh, perishable food;
- proximity to services, including waste treatment facilities;
- waste and by-products recycling and re-use possibilities.

The risks include:

- environmental and health risks from inappropriate agricultural and aquaculture practices;
- increased competition for land, water, energy, and labor;

⁸ Horticulture comprises vegetables, fruit crops, root and tubers, ornamentals, mushrooms and condiments.

Egypt

Fighting malnutrition and poverty through roof-gardens in Cairo

In 2000 appeared the first roof gardens in Egypt, under the leadership of the *Alaru*, the Research Unit for agricultural lands and the *Ain Shams* University of Cairo, in collaboration with several local NGOs strictly connected to the urban territory and vulnerable citizens.

The impact of the *Green Food from Green Roofs Project* in Cairo comes from the following main factors:

- Micro/Roof-gardens are a suitable alternative to keeping poultry on houses' roofs, a traditional practice in Cairo, nowadays forbidden in the framework of Avian Flu prevention
- Micro/Roof-gardens offer families new opportunities to live on the roofs and to share the daily family time in a fresh and green environment, while picking-up fresh vegetable products for their meals
- Micro/Roof-gardens allow people to keep their roofs clean, instead of using them as a waste area

In recent years, Micro/Roof-gardens have been proposed as *Food Safety Nets* in the context of “*Soaring Food Prices*” initiative. It is foreseen that agriculture in and around urban areas is going to play a key role in fighting poverty and malnutrition in cities during this new Millennium.



[Source: FAO]

60-100 percent of the fresh and perishable food (vegetables, fruit, poultry, eggs, milk, and other non wood forest products) consumed by the urban poor are produced within or around the cities in West Africa (Drechsel et al 2006). Horticulture, mainly vegetable production, has naturally expanded in and around cities in many developing countries as an informal activity practiced by poor and landless city dwellers. The broad diversity of horticultural crop species allows year-round production, employment and income. Growers have realized that intensive horticulture can be practiced on small plots, making efficient use of limited water and land resources. Horticultural species, as opposed to other food crops, have a considerable yield potential and can provide up to 50 kg of fresh produce per m² per year depending on the technology applied. In addition, due to their short cycle they provide a quick response to emergency needs for food (several species can be harvested 60 to 90 days after planting.)

The contribution of urban and peri-urban agriculture and forestry to poverty reduction, food security and the well-being of urban citizens depends on the advantage taken of the opportunities listed above, and on the commitment taken to deal with the risks and constraints in order to ensure sustainability.

Some countries (e.g. DR Congo, Burundi, Namibia, Guinea, Ivory Coast...) refer to Urban and Peri Urban Horticulture (UPH) in view of the role of horticulture comprising fruits, vegetables, roots and tubers as the predominant sector of productive activities in the urban and peri-urban environment, while small livestock, aquaculture and urban and peri-urban forestry are considered to be complementary in accordance to prevailing local opportunities.



In Latin America, approximately 15% of households in Lima (Perú) pursuing UPA according to Urban Harvest assessment, by far the most important is raising of small livestock, because of the limited space required. In some slum areas, as much as 48% of households are involved, but the vast majority is livestock. In Kenya, Africa, livestock is also crucially important, for example in the Kibera slum. In cities like Bogotá, Colombia the daily production and consumption of a micro-garden of only 4m² can provide an estimated savings of US\$ 1.3 per day.

BOLIVIA

Urban and Peri-Urban Agriculture at 4,000 meters above the sea level

“El Alto” is one of the poorest municipalities of Bolivia, with a population of over 1 million. The people migrated from the mining centres and rural areas in search for better livelihood at the altitude of 4,000 meters the temperatures are cold all over the year with night frost, snow and hail stones, as well as extended drought periods. In this environment it is not easy to intensify open field production. The diet is mainly based on cereals, legumes, and root crops with prevalence of vitamin deficiencies which has induced some nutrition linked health problems. The Project of “Popular Micro-gardens” implemented by the municipal authorities of El Alto with the assistance of FAO and financial support from the Government of Belgium has initiated a urban and peri-urban agriculture program with the aim of improving the availability and access to high quality vegetables and reducing poverty. Essentially the project has introduced small scale and simple “solar” green houses, combined with micro-garden and organic production technologies. Since the initiation of the project in 2003, some 7,000 families have benefited from training and access to infrastructure and supplies. The organic waste material from the garden is recycled to feed and raise Guinea pigs and to produce compost to maintain soil fertility.



[Source: FAO]

Colombia

In slum areas in the Colombian cities of Bogotá and Medellín, FAO is operating a project to support vegetable production by internally displaced persons (IDPs). With limited access to land, local experts have taught hundreds of families living in “barrios” how to produce their own vegetables right inside their homes in micro-gardens using a curious array of containers including recycled water bottles, old tyres and trays. The techniques used are based on substrate growing or simplified hydroponics (in which water substitutes for soil), and recipients are positioned wherever there is enough space and light -- on windowsills, in courtyards and even on the stairs. Every month, each family’s “garden” yields some 25 kg of produce including lettuce, beans, tomatoes and onions. Any surpluses are sold off for cash to neighbors or through a cooperative arrangement.

This project is reaching over 32,000 families for the past few years (http://news.bbc.co.uk/1/hi/spanish/business/newsid_7125000/7125709.stm). “The CFF Bogotá will begin to implement the “Farming in my house” Project which seeks to innovate in a number of areas. A first innovative element is the design of 20 gardens on hard ground (interior and roofed patios), which is intended to be agreeable, functional and low-cost. At first, the project will help to improve the diet of the beneficiary families, with the cultivation of around 10 species including vegetables, fruits and grains, thus helping to guarantee the availability, access and consumption of healthy, high-quality food. Another innovative aspect of the project will be the combination of food security and scientific research (conducted by the Botanical Garden of Bogotá and related to the efficiency of growing plants in certain containers), while taking advantage of household space. It will also promote innovative solid waste management mechanisms (composting) and the collection of rainwater in each house, thus contributing to the process of environmental awareness raising, through the implementation of environmentally-friendly technologies” [Source: <http://www.ruaf.org/node/1521>].



The Urban Agriculture Project, sponsored by the Government of Italy, an alternative is found to strengthen the capacity of families displaced by violence to produce clean vegetables in their own gardens and increase their consumption within the daily diet. The project is being developed in different localities of Bogotá and Medellín and allows the families the opportunity to learn and incorporate new species in their gardens and on their diet. These positive results are already spreading to other regions of the country, and that Colombia is the third country with the largest displaced population in the world, and four out of five displaced persons living with a narrowness great economic and without access to enough food for a normal nutrition. A group of 156 recipients Bogotá and Medellín, Colombia, participants in education workshops in food and nutrition Project achieved through participatory methodologies to quantify savings daily average household of 1.65 US\$, (Colombian pesos in value \$ 3,300) thanks to the production of vegetables in cottage gardens and demonstrations and Training Centers, foods should be bought before shops and market places, in disadvantageous conditions of hygiene quality and price.

[Source: <http://www.rlc.fao.org/es/agricultura/aup/pdf/derecho.pdf>]

A recent evaluation of the project “Micro-gardens El Alto” of El Alto, Bolivia confirms that families with some form of food production increased their consumption of fresh and fruit and vegetables by 85%, and diversified their basket of consumed species from 6 to 15.

Leafy vegetables provide a quick return to meet a family’s daily cash requirements for purchasing food. Leafy vegetables are particularly perishable and post-harvest losses can be reduced significantly when production is located close to consumers. In general livestock activities are less common than cropping activities, but there are cases (Ecuador, Madagascar) in which livestock is as, if not more, important (Zezza and Tasciotti, 2008).

Cuba

“The Cuban transformation is a perfect example of how quickly and effectively supportive government policies encouraged urban agriculture. The government programs are successful because they are not static; they change in response to the needs of producers and consumers” (UA Magazine Special Edition – World Food Summit, Five Years Later 2002, 11). Caused by fuel shortages, transport problems and lack of pesticides Cuba has been forced to take action to ensure food supply to its cities. Consequently many so-called highly productive organoponics have been set up in the cities and biological pest control has been favored. “The growth of urban agriculture in Cuba and the uptake of related and innovative technologies have been dramatic and impressive. In just over ten years, between 1989 and 2000, it has moved from a marginal component in urban food systems to an activity covering 12 percent of the land area of the city of Havana, involving a network of more than 22,000 urban and peri-urban producers, providing between 150 to 300 grams of fresh vegetables and culinary herbs daily and has resulted in the near elimination of local refuse dumps for household waste. Havana’s agriculture involves a range of different systems and technical innovations, but one of the most interesting from an institutional and policy point of view is “organoponics”, an example of institutionalized spatial intensification and bio-intensification in urban areas, supported by the local authority” [PRAIN 2006: 308].

Organoponics in Havana (Source: Drescher)

In the city of Havana, 11 *Centros de Reproducción de Entomofagos y Entomopathógenos* have been installed to provide education for organic farming and natural pest control to urban farmers and the reuse of solid waste as fertilizer (Novo & Merzthal, 2002). Contribution of UA production to urban employment, income and food expense savings, 1990’s: Producers, self-provision market: 117,000 direct and 26, 000 indirect jobs (MOUGEOT 2005: 9, based on GONZALES&MURPHY 2000). “UA efforts for almost 60 % of all Cuban vegetable production and the average production outputs in some municipalities already reach the level required to meet the daily dietary vegetable intake of 300 grams per person recommended by the FAO [PREMAT 2005: 153-154, based on CRUZ & MEDINA 2001].



The city of Havana under the theme “Growing Cities – Growing Food” has also developed “Mi Programa Verde”, promoting the urban forestry. Under the leadership of the “Servicio Estatal Forestal Ciudad de la Habana”, this urban forestry program aimed to answer to the growing “silent” deforestation although reforestation plans were implemented since the 60’s. The program promoted fruits and wood trees based on community involvement. Educational program, technology transfer, and participatory planning were key elements of success. The income generation, from the selling of the multipurpose nurseries, as well as the harvesting of fruits for improved diet, involved thousands of families.

Designing the Edible Landscape

The capital of Uganda, Kampala is also its largest urban district. The city is home to more than 1.2 million people—40 percent of whom live in absolute poverty. In addition to being the country's political centre, the city is also the hub of Ugandan administrative, commercial, and industrial activity. Covering 195 square kilometers, Kampala has been referred to as the garden city of Africa due to its lush growth—a product of a mild climate and generous rainfall.

For decades, residents of Kampala have relied on urban agriculture for food, employment, and income. Farming activities have spread throughout the Ugandan capital, taking over all manner of available space from abandoned fields to grounds along roads and waterways. Unfortunately, many residents viewed these agricultural activities as a nuisance. Roaming livestock raised frequent road-safety concerns, while other farming practices were considered harmful to public health and the environment.

“Our bylaws were outdated,” admits Winnie Makumba, Kampala City Minister of Social Improvement, Community Development and Antiquities. “They failed to recognize that many residents derived their livelihoods from urban farming. We realized it was up to us as political leaders to initiate the policy changes that would support urban farming practices.” In 2001, Kampala city government set out to revise existing legislation related to urban farming. Two years later, the Kampala City Council District Extension Office, in collaboration with the Kampala Urban Food Security, Agriculture and Livestock Coordination Committee (KUFSAALCC), spearheaded a consultative process to re-examine draft bills for five city ordinances. Resistance to change, however, ran deep in Kampala, partly because urban agriculture challenges prevailing attitudes. Influenced by colonial bylaws, these attitudes hold that urban farming is inappropriate in cities.

Meanwhile, with attitudes to urban agriculture shifting, Kampala has joined the Edible Landscape Project (ELP). A partnership with IDRC, the Netherlands' ETC-Urban Agriculture unit, and McGill University School of Architecture, ELP aims to reengineer cities from traditional centers of food consumption to primary hubs for food production. “ELP helps us showcase the integration of urban agriculture into urban planning and housing design,” says Margaret Azuba. On land donated by the city, municipal officials, architects, and urban planners will work closely with community members to improve housing, income, and food security for some of Kampala's most vulnerable citizens.”

[Source: http://www.idrc.ca/uploads/user-S/11502208271CRA_WUF_ENG_FINAL.pdf]

Urban livestock keeping has been in existence for many years, and despite perceptions to the contrary, it may even make a comeback thanks to its various roles such as effective utilization of empty plots, cleaning up of waste, and the provision of both fresh food and income. Urban livestock is not a new phenomenon and it occurs in cities across the globe, not only in the tropics. The most important aspect of urban livestock production is the generation of income. Animals are an effective means of generating cash for the poor sector of the population. They also provide fresh produce in the inner city with little or no packaging and processing, and few additional costs. The need for and cost of transport is reduced and this impacts on traffic flow. Furthermore, animals play an important role as waste cleaners utilizing domestic garbage, hotel waste and agro-industrial waste that would otherwise remain in the street.

However, there are aspects of urban livestock and coping strategies that need to be developed in parallel to reduce negative impacts. Public health problems can often be encountered. These include diseases such as parasites from pigs or viruses such as Avian Flu, with its potential for transmission to humans. Smell, dust and noise with related pollution (due to manure effluent and wastes e.g. from slaughterhouses) are the main nuisances described. High density livestock production where space is limiting also creates health and welfare problems for animals. Due to the increasing phenomena of livestock production in and around cities and its importance toward improving household food security, FAO has developed coping strategies. Capacity building to assure better veterinary health services and better treatment is associated with appropriate awareness raising in the frame of livestock programs in peri-urban areas. The implementation of smaller scale enterprises and the use of small animals are also part of these coping mechanisms. Through the Special Programme for Food Security (SPFS),

FAO helps Low-Income and Food-Deficit Countries to improve their food security both at national and at household levels.

The importance of non wood forest products (edible or not), as well as the fuelwood, has widely been documented. These products are often under statistics of agricultural sector but for their management, depend on other institutions – mainly forestry - and their sustainability is put at risk due to higher difficulties in securing the land and resource tenure and access to. A specific attention to the link between nutrition and tree and forest cover in the context of urban development needs to be documented and integrated in UPA.

Woodfuels Integrated Supply/Demand Overview Mapping (WISDOM)

Wisdom for cities – an Analysis of wood energy and urbanization aspects using WISDOM methodology

FAO's Woodfuel Integrated Supply/Demand Overview Mapping (WISDOM) methodology is being adapted to the context of urbanization and urban environment. The development process initiated shows that "WISDOM for Cities" is a useful tool for the mapping of sustainable resource potential and woodfuel consumption areas, identification of deficit and surplus areas and the pragmatic definition and visualization of areas influenced by the urban/periurban consumption of wood energy and definition of priority areas for intervention. The document discusses the link between urban forestry and wood energy and proposes to policy makers, decision makers and stakeholders the way forward to address the related issues and for the methodology development and application.

The methodology is been developed through pilot initiatives such as during the process development of the Strategy and Action Plan for Urban Forestry of Bangui, capital of Central African Republic where fuelwood is considered as an important income activity and major factor of deforestation around the city.

[Source: FAO, 2007, WISDOM for Cities – Analysis of wood energy and urbanization using WISDOM methodology.]

Urban and Peri-urban Forestry and Greening in West and Central Asia

The outlook studies on the role of the forestry sector and the capacity of the related institutions in implementing its responsibilities has been assessed in the context of the development of the West and Central Asian Countries, targeting the scenarios and recommendations to 2020.

In contribution to this Forestry Outlook study for West and Central Asia (FOWECA), a study on the experiences, constraints and prospects of the 23 countries involved confirmed that the needs at legal, policy, awareness raising, technology transfer and basic knowledge exchange within and with other regions of the world are very weak. During an international workshop (Rome, from 5 to 7 April 2006) participants could analyze with more attention 6 case studies of Asian countries: United Arab Emirates (Abu Dhabi), Jordan (Amman), Kazakhstan (Astana), Turkey (Izmir), Afghanistan (Kabul) and Armenia (Yerevan). The experts confirmed the key role of trees and forest in the sound development of the cities

[Source: Randrup T.B., Schipperijn J. and Konijnendijk C.C. (2007) FAO, Rome. 89 p.]

4.2 Group organization and training

Without organization, individual low-income producers have little or no opportunity to improve their conditions. As individuals, they often lack access to the resources of production – land, water, credit, inputs etc. Whilst they may find space where they can grow some food for themselves and sometimes even a surplus for sale, their options are severely limited whilst they act alone. Individuals also have no power and no voice in attempting to improve any of the above critical areas for UPA. Improving access to inputs, credit, advice and training, applications for land and water rights, lobbying power – become achievable goals once urban producers are organized. In some cities and countries, forming groups may be particularly difficult – particularly where the activities of the group are themselves illegal. An agricultural

production group in an area where agricultural production is not permitted, while it will have some benefits of group action, will not be able, for example, to access government advice and subsidies.

Zimbabwe

Groups in Chitungwiza (a dormitory town of Harare) have accessed training more as groups than individuals. Many individual farmers reported that they had no access to training prior to joining groups. In Mabvuku, groups have received training from an NGO called Environment Africa as well as state bodies such as AREX (Department of Agricultural Research & Extension services, University of Zimbabwe). In Budiriro and Warren Park, groups received specialist training in mushroom production. In Chitungwiza the strawberry producers are receiving continuous support and training from AREX.

[Source: GCP/INT/955/CAN Project, City case studies, Harare, Zimbabwe]

Mali

In Bamako and Ségou (Mali), the communities were very concerned by the erosion of the biodiversity basis in the agroforestry parkland and the need to control the urbanization process in relation to the land and natural resource management. The World Agroforestry Centre (ICRAF) and Laval University (Canada) supported together the promotion of a multistakeholder platform on agroforestry for these cities. The research action approach allowed to work with communities, neighborhoods and NGOs and governmental organizations at transferring the good practices for productive agroforestry systems, and build the platform of private, public and governmental organizations in order to plan in a participatory manner the trees in the growing cities, and address the issues of tree maintenance and deforestation.

4.3 Access to credit and other financial services

What if you could harness the power of the free market to solve the problems of poverty, hunger, and inequality? To some, it sounds impossible. But Nobel Peace Prize winner Muhammad Yunus is doing exactly that. As founder of Grameen Bank, Yunus pioneered microcredit, the innovative banking program that provides poor people—mainly women—with small loans they use to launch businesses and lift their families out of poverty. In the past thirty years, microcredit has spread to every continent and benefited over 100 million families. But Yunus remained unsatisfied. Much more could be done, he believed, if the dynamics of capitalism could be applied to humanity's greatest challenges. In *Creating a World Without Poverty*, Yunus goes beyond microcredit to pioneer the idea of social business “By giving poor people the power to help themselves, Dr. Yunus said.

Despite the well established recognition of the role of increased agricultural production and processing of agricultural produce in order to meet the rising demand for food, small farmers continue to face problems in accessing the required financial services that will enable them to carry out their activities in a business like manner. In particular, lack of access to seasonal credit and longer term loans for investment in agriculture, but also savings and deposit facilities that will help them build up reserves for the future that can be used to mitigate shocks and to meet unexpected expenditures are of importance to the farmers as is also access to quality advisory services. To the extent financial institutions are present in the rural areas, they are often of a member-based nature, e.g. credit unions, savings and credit cooperatives etc. Although their mandate is to serve their members, they are often unable to satisfy all the needs of the farming population due to lack of resources. Their lending base is normally composed solely of member contributions in terms of savings and deposits. A possibility to increase the lending base is to link with a more formal type of institution such as a commercial bank who could provide a credit line and thus act as a lender of last resort.

There are examples of successful linkage models but they all have in common that the formal institution would first need to perceive an interest and a profit over time from entering into such arrangements. Formal institutions are generally speaking not interested in serving the farming population directly due to lack of knowledge and understanding of agriculture and its specific risk pattern. The high operational cost associated with serving a geographically often very wide-spread clientele further adds to their reluctance.

The situation for urban and peri-urban farmers is far from being any better. In addition, the situation of urban and peri-urban farmers is made considerably worse by the lack of legitimacy of the urban agricultural sector. Despite the geographical proximity, urban based commercial banks and other financial institutions usually do not cater to this category of farmers. Commercial banks normally find enough business in other sectors of the economy and therefore do not consider urban and peri-urban farmers as being potential clients. Micro finance types of institutions are therefore most likely those who could best serve this sector.

As in rural areas, women often represent the majority of farmers in urban areas. Most urban farmers and in particular the women, are resource poor. This prevents them not only from increasing their production but also from presenting acceptable collateral in order to obtain a loan from a bank. Their credit worthiness is further limited by the fact that their farming activities have a level of insecurity considered too high by most lenders. They do not own the land, they farm on plots only temporarily available, their produce is more prone to theft than in a rural setting, and even when considered legitimate, their activity often lacks official recognition and an institutional base. When access to credit exists, it is rarely tailored to meet the needs and requirements of these women farmers.

Given that UPA often plays a significant role in improving food security and in generating income, city authorities, with possible support from aid agencies, NGOs etc. should create an environment whereby financial institutions would be encouraged to establish contacts with urban farmers. As an example, they should organize information meetings in which Micro finance institutions participate and conduct basic training courses on business planning and simple bookkeeping. In order to be able to tailor their products and services to the needs and capacities of urban and peri-urban farmers, banks would however themselves need to increase their knowledge about small-holder agriculture and to understand the specific constraints to offering financial services, including savings and deposit facilities, to small scale agriculture. High systemic, market and credit risks, slow return on investments, low profitability of small-holder agriculture, inability to offer guarantees due to low levels of assets and insufficient financial management capacity of farmers are some of the main obstacles to developing durable and for both parties profitable bank-clients relations. If governments choose to formalize and/or support UPA, financing and marketing options can be explored to improve UPA's efficiency, effectiveness and safety.

Organization of urban farmers into groups or associations could improve their access to credit and loans. Dealing with only one entity representing several farmers, banks would typically lower their operational costs. In addition, peer pressure from the group members would lower the risk of loans not being repaid on time. Groups should however not be formed with the sole purpose of obtaining credit and loans. History shows that the most successful cases of group formation are those when other benefits such as improved access to high quality inputs at better conditions through group command and organized output marketing can be achieved. Various models of group financing exist ranging from loans to groups for distribution to the individual members, rotating funds, group managed loans and schemes to the well established Grameen Bank type of financial intermediation. The Grameen Bank, Bangladesh, is an independent financial institution with a group-based credit approach that utilizes the peer-pressure within the group to ensure the borrowers follow credit discipline. The bank also

accepts deposits, provides other services, and runs several development-oriented businesses. The vast majority of its clients are women. Grameen Bank receives since its creation substantial donor support and often serves as a model for the establishment of institutions with similar philosophy.

Community empowerment is essential for the sustainability and acceptance of the program interventions. Community empowerment starts with farmer organization. Farmers and/or farmer families will be encouraged to create and join professional associations. This will allow them to get the benefit of participative training through the Farmers' Field School (FFS) approach and improve their eligibility for loans. Farmer organization will however have to be carried out in a participatory manner in order to create a true sense of ownership among the farmers. Farmers' organizations have become a pre-requisite for access to training and micro-credit. This is particularly applicable in the urban and peri-urban environment where the individual participants are scattered over different neighborhoods.

Urban micro-finance in India

While 70% of India may still be "found in its villages", India, like the rest of the world, is increasingly urbanizing. Depending on measurement criteria, two to three of the ten largest cities in the world can be found in India, and it is estimated that the country will be more than 40% urban by the year 2030. While the number of rural poor decreased from 25.7 crores (257 million) to 19.3 crores (193 million) between 1991 and 2001, the number of urban poor actually increased from 5.2 crores (52 million) to 6.7 crores (67 million). Despite the large numbers of urban poor, most of who have little or no access to formal financial services, there is relatively little outreach of microfinance in major urban areas today. Interestingly, the rural focus of microfinance in India, and much of Asia, is in stark contrast with the predominantly urban orientation of microfinance in the rest of the world. While Indian microfinance practitioners have expressed reluctance in the past to target urban markets due to perceived high levels of client mobility and weaker social ties, many practitioners in other regions of the world are often reluctant to penetrate rural areas due to perceived high costs of outreach. Despite persistent efforts on the part of the global microfinance sector in knowledge capture and dissemination, there remain some matters on which regional markets still have much to learn from each other.

Though much of the energy of the Indian microfinance sector to date has been directed towards the rural poor, some of the pioneers of the sector have always had a strong focus on urban poverty. SEWA Bank, for example, was founded in 1974 and has over 1.5 lakhs (150,000) clients, most of them in urban Ahmedabad. Similarly, Working Women's Forum has been providing microfinance and other livelihood services to poor women in Chennai since 1978. Interestingly, both these institutions have been guided by a holistic approach to combating poverty, steeped in a deep understanding of the myriad of challenges faced by the urban poor. On comparing the purpose and size of loan, it is clear that larger loan amounts (> Rs. 20,000) are being used for productive assets, such as work equipment, livestock, and housing and infrastructure. The average loan outstanding depends on the purpose for which the loan is taken as shown below.

Loan Type	Average Outstanding amount (in Rs.)
<i>Enterprises:</i>	
Work Equipment	36,000
Livestock	33,000
<i>Consumption:</i>	
Infrastructure/Housing	27,000
Social Expenses	25,200
Education	14,500
Medical	9,600
Others	3,000

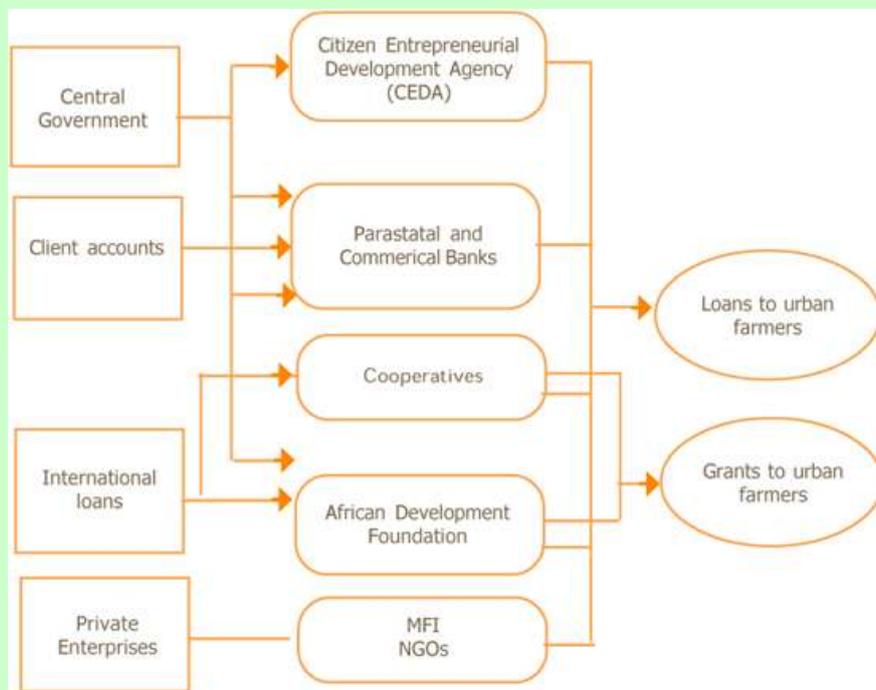
Figure 9: Enterprise Loans Are Much Larger Than Consumption Loans

Source: Michael & Susan Dell Foundation and CARE India - 2006, A Promise to Pay the Bearer, An Exploration of the Potential for Urban Micro-finance in India.

The Botswana experience

Figure 4.4 (see below) “Financing of UA in Botswana” shows, the multiple intermediaries that transform very diverse financial resources from central government, individuals, international and private enterprises into loans and grants to urban farmers. In this case, the following intermediaries were identified: (a) commercial and parastatal banks; (b) Citizen's Entrepreneurial Development Agency - CEDA (c) Cooperatives; (d) African Development Foundation, (e) NGOs (f) Micro-Finance Institutions. The existence of multiple intermediaries does not always mean that they are resourceful and that their products are accessible to most urban farmers. They suggest on the contrary that some effort should be made in order to connect these initiatives and to focus on the one(s) that would have the best comparative advantages. The complexity of intermediaries, as illustrated by these two cases, was found in most situations analyzed. This suggests that efforts should be taken to give this information to urban farmers in a simpler way. Urban farmers are usually interested in knowing about the reliability, quality of service and financial conditions on loans of intermediaries. But above all they are interested in clear information on the duration of credits and grants offered. Brochures that explain these options in simple terms appear to be a necessity, not only in St. Petersburg and Botswana but in the majority of the cases studied.

Figure 4.4 *Financing of urban agriculture in Botswana*



Source of the table: Moshia, A.C. "Credit and Investment for Urban Agricultural Interventions: Case Study: Gaborone City, Botswana," University of Botswana, Gaborone, July 2002 & Keboneilwe, D.L. "Credit and Investment schemes for urban agriculture". Power Point presented for the International Panel Microcredit and Investment for Urban Agriculture, Barcelona, 2004. Cabannes, Y 2004a.

Source: Financing and Investment for Urban Agriculture by Yves Cabannes and Marielle Dubbeling in “Cities Farming for the Future, Urban Agriculture for Sustainable Cities. Edited by René van Veenhuizen. Published by RUA Foundation, IDRC and IIRR. Included bibliographical references. - 2006”.

4.4 Food processing and street foods

The concept of urban agriculture does not refer only to production activities, but also to the other components of the food chain from field to fork. The high concentration of urban population and the lack of mobility of the urban consumers have created new enterprise opportunities. Street foods address the evolving habits of people constrained to satisfy their food requirements during the day without having the possibility to move back and forward from the work place to home.

Many urban poor have neither physical nor economic access to adequate and safe foods, or to the facilities required to store and prepare them. Micro-nutrient rich foods are often perishable and expensive. Shortening the food chain and improving access to fresh fruit and vegetables should contribute to a more balanced diet.

People who move to cities must adopt new methods of acquiring, preparing and eating food. Many city-dwellers have limited time for shopping and cooking and they rely increasingly on processed and convenience foods, including street foods. As a result, under-nutrition and micronutrient deficiencies, coupled with over-nutrition and rising problems of obesity and diet-related chronic diseases can be found in most cities.

Street foods are ready-to-eat foods and beverages prepared and/or sold by vendors or hawkers especially in the streets and other similar places. They represent a significant part of urban food consumption for millions of low- and middle-income consumers, in urban areas on a daily basis. As the size of cities is increasing, more time is spent commuting, and less and less people return home for lunch. There is now a demand for more processed meals close to the work place, since employers or institutions offering meals and catering facilities are almost non-existent in cities in developing countries. Home-prepared meals have been gradually replaced by restaurant and street food. Street foods may be the least expensive and most accessible means of obtaining a nutritionally balanced meal outside the home for many low income people, provided that the consumer is informed and able to choose the proper combination of foods. In Ibadan, Nigeria, 98 percent of schoolchildren buy their breakfast in the streets (Ruel *et al.*, 1999). In Accra, female-headed households obtain 20 percent more calories from street foods than male-headed households (Levin *et al.*, 1999).

Street food preparation and selling provides a regular source of income for millions of men and women with limited education or skills in developing countries especially because the activity requires low initial investment. It also supports local agricultural producers and food processors and contributes to local and national economic growth.

Today, local authorities, international organizations and consumer associations are increasingly aware of the socioeconomic importance of street foods as a component in the UPA chain, but also of their associated risks. Food safety is a serious concern in many urban areas in developing countries, where poor conditions of transformation can lead to contaminated food. Other concerns are also reported such as sanitation problems (waste accumulation in the streets and congestion of waste water drains); traffic congestion in the city including for pedestrians (occupation of sidewalks by street vendors and traffic accidents); illegal occupation of public or private space; and social problems (child labor, unfair competition to formal trade, etc...).

The risk of serious food poisoning outbreaks linked to street foods remains a threat in many parts of the world, with microbiological contamination being one of the most significant problems. Food-borne pathogens are recognized as a major health hazard associated with street foods, the risk being dependent primarily on the type of food, and the method of preparation and conservation. A lack of knowledge among street food vendors about the

causes of food-borne disease is a major risk factor. Poor hygiene, inadequate access to potable water supply and garbage disposal, and unsanitary environmental conditions (such as proximity to sewers and garbage dumps) further exacerbate the public health risks associated with street foods. Improper use of additives (often unauthorized coloring agents), mycotoxins, heavy metals and other contaminants (such as pesticide residues) are additional hazards in street foods. Although many consumers attach importance to hygiene in selecting a street food vendor, consumers are often unaware of the health hazards associated with street vended foods.

As with all food preparation activities, the basic food hygiene rules must be applied. As most street food vendors are untrained in food hygiene or sanitation, and have to work under very poor and unsanitary conditions, FAO has been dedicating great attention to sensitization and training of the different actors of this complex system. Attention is being given to realistically adapting the guidelines of Codex Alimentarius regarding the General Principles of Food Hygiene and the HACCP system to the street food context. The Codex Regional Coordinating Committees have elaborated respective codes of hygienic practices for street vended foods which take into account the local conditions and the special nature of street foods.

FAO has developed guidelines for nutrition education and, most recently, a detailed curriculum for nutrition education in schools. Effective nutrition education programs for school children and other key community groups are essential means of equipping street food customers with the knowledge necessary for making healthy food choices. In addition, any training and awareness raising program is made more difficult by the fact that most vendors are individual operators: there are still very few organized associations of vendors and therefore no mechanism for accessing credit, nutrition information or ingredients of better nutritional quality, or for interacting with food quality control agencies.

Unfortunately, some of the food safety knowledge of the vendors in many cities can not be translated into practice due to the absence of basic facilities, such as water and toilets, at their vending sites. Most of the operators live in an unstable and precarious state because the sector lacks full legal recognition: they are therefore not in a position to make investments in their activity, nor to plan some development of it over time.

The commercial peri-urban production of livestock is an extremely fast-growing sector, representing 34 percent of total meat production and nearly 70 percent of egg production worldwide. With it comes expansion in food processing activities in the peri-urban zones, which, while providing employment, does raise issues related to pollution and food safety. Individual access to food in urban areas very much depends on the ability to generate income. In this context, governments should recognize the role played by UPA and street food in making food available to poor families in urban areas and in generating income for women. These key sectors, dominated by women need to be assisted in the fight against increasing urban poverty, inequity, and food insecurity in cities. A specific approach including capacity building for food quality control activities has to be developed by municipalities, as this sector is usually addressed at the decentralized level.

4.5 Urban Food supply and marketing

UPA offers the comparative advantage of its location close to important consumers' concentrations: the urban population. The proximity allows for saving on energy at various levels of the food chain, which is on packaging, transport, storage, and distribution, that will affect the final retail price of the food commodities. The costs of supplying and distributing

food from rural areas to the urban areas (increase in fuel cost, deteriorating transport and storage infrastructure...) or to import food to the cities are rising continuously. In developing countries, long distances, bad roads, poorly maintained trucks, lack in cold storage, and urban crowding cause spoilage of 10 to 30 percent or more of post-harvest produce in transit (FAO, 2005). The maintenance of good road network and resistance of infrastructures during extreme weather events are closely dependent on the watershed management. In addition, cities are expanding by increasing the distance between fringe and centre, resulting in reduced food availability in some areas of expanding cities. Food supply to the cities and related logistics depend very much on the location of the city as well. Coastal cities can benefit from seaports; while inland cities or landlocked countries are more vulnerable as they depend on available transport facilities and their maintenance. Cultivation of food crops within and around the cities will help to offset excessive dependency on higher priced external supplies as well as buffering from transport-related problems.

Cutting down the ecological footprint

Urban farming also cuts back on “food miles” — the energy required to get food to your plate, which is a big factor especially where most packaged food is imported. “Our data show that the average food item found in a supermarket or food shop in Ghana’s capital, Accra, travels by air 3700 km before it is on the shelf, nearly twice as far as in New York”, says Pay Drechsel from IWMI’s Africa office. In Canada, with an average transport distance between farm and fork of 2400 km, the David Suzuki Foundation estimated that the production of the food needed to feed a family of four, including packaging and distribution, releases up to eight tons of carbon dioxide annually.

Poor urban households are likely to reside in slums. The distance to markets offering the greatest variety of products poses a problem, i.e. either accept the long travel (time, cost and inconvenience), or go to the small local stores which charge a much higher price for sometimes lower quality produce as noted by De Langen (1994) in the city of Dar es Salaam. In order to address such and other challenges, FAO’s Right to Food Guidelines urge States to promote “as appropriate, [...] The development of small-scale local and regional markets and border trade to reduce poverty and increase food security, particularly in ... urban areas” (Guideline 4.5).

UPA in Germany: learning from the past

Conditions of hunger and poverty were widespread in Germany and other European countries nearly 200 years ago when the first "gardens for the poor" emerged. Rapid industrialization, accompanied by urbanization and migration, forced large numbers of people into dismal living conditions. In Germany and other parts of Europe, food riots were widespread, reaching a peak around 1850 (Gailus 1994). Urban allotment gardens were one response to this food crisis. Allotment gardens consist of a piece of land between 200 and 400 square meters, most of them with a little shed for storing gardening tools. Allotment gardens formed a buffer for food security, especially in times of crisis. Shortly after WW II, Berlin contained 200.000 allotment gardens. Many more people would have suffered from hunger if there were not gardens and open spaces in the cities able to be used for food production. Today there are still about 80.000, and nearly every German city has some areas designated to this type of urban and peri-urban agriculture. The basis for a successful and permanent establishment of allotment gardens was laid through the creation of associations of small scale gardeners in the cities (Kleingartenvereine). The council provides the land, establishes a water system and eventually fences the area. New developments in most German cities heavily promote organic farming and the banning of pesticide use in public owned urban allotment gardens. In Germany today more than 1.4 Million organized allotment gardens exist. All together they occupy an area of nearly 47.000 ha (BVGF 2000). Additionally we find millions of private home gardens. Allotment gardens play an important role for the production of fresh fruits and vegetables but also for recreation and conservation of nature in cities. The latter became the most important reason for the conservation of those gardens in cities. Many of the members of the associations are pensioners. Recent developments in Germany show a shift in ownership of gardens from German owners to migrants from other countries - e.g. Russia and other Eastern European Countries.

[Source: Axel Drescher]

Marketing of UPA production is facilitated by the proximity of producers to consumers but the availability of simple selling places (shaded structures) should be promoted. Easy access of UPA producers to local market places is also an issue that needs to be addressed. In some countries, UPA farmers have grouped together to facilitate direct marketing to consumers e.g. Sacolao in Brazil and are able to offer cheaper produce to low income consumers. In cities like Dakar, Bamako, Accra and Kumasi, depending on crop and season, between 60 and 100% of the consumed leafy vegetables are produced within the respective cities with employment figures ranging from 1000 to 15,000 jobs.

Tanzania

Dar Es Salaam' Contribution of UA production to urban employment, income and food expense savings, 1990's: 90% of leafy vegetables produced in the city, 60% of milk (16% intra, 44% peri-urban), 20-30% of food consumption produced in 50% of households (MOUGEOT 2005: 9, based on Stevenson et al. 1996, Jacobi 2000, Sawio, 1993).

"UA has received attention and support on various policy levels and is accepted as a land use in the city. In the *Strategic Urban Development Plan* (SUDP), special land-use zones have been designated for agriculture". Poultry rearing in 1993: 1.9 million, pigs: 33,564, goats: 40,930 (UA Magazine Special Edition – World Food Summit, Five Years Later 2002, 17).

In 1993, the city's policy makers found that agriculture in the city contributed substantially (almost 30%) in household food supplies and that it had become integral part of urban livelihood strategies. These finding led to the *SUDP* (KITILLA & MLAMBO 2001). 74% of urban farmers keep livestock (SCHIERE et al. 2006).

"Urban agriculture forms at least 60% of the informal sector and urban agriculture is the second largest urban employer (20% of those employed). In 1993, urban fresh milk production was worth an estimated USD 7 million. The annual gross output of over ten thousand urban agricultural enterprises in the city of Dar es Salaam totaled more than 25 million USD" [Source: COFIE et al. 2003: 5]



The Philippines

"44,7% of Cagayan de Oro City's area is used for agriculture (...) daily consumption of vegetables is highest among farmers (...) and 73% of vendors of agricultural products are women" (UA Magazine Special Edition – World Food Summit, Five Years Later 2002, 19)

"44% of farmers surveyed in Cagayan de Oro indicated vegetable production as their main source of livelihood (MOUSTIER&DANSO 2006: 177).

Agriculture employs 9% of the economically active population, there are 13,000 farmers in the peri-urban area and 40% (95,000) of all households maintain backyard gardens. 70% of city's demand for fish is produced within the city (POTUTAN 2000).

Through the Europe Aid's AsiaUrbs Programme, pilot allotment gardens were established in different parts of the city. 55% of the household waste can be used for composting and further 10% is recyclable and marketed by a garbage picker's organization (HOLMER et al. 29-31).

Nine self-sustaining gardens including school gardens (each with six to twenty land parcels of about 300m² enabling a total of more than 100 urban poor families to get legal land for vegetable production established between 2002 and 2006. Two of them have been sponsored by private donors from Germany. [Source: TIXIER & DE BON 2006, Drescher et al. 2007].

Democratic Republic of Congo

Urban and Peri-urban Horticulture in Democratic Republic of Congo

A city like Kinshasa needs daily some 500 tons of fruits and vegetables for a weak consumption level of 50 grams per capita. Besides providing essential food for a balanced diet of the family, UPH has developed into a real commercial activity providing, according to certain sources, more jobs than in any other sector of the informal or formal economy. It is estimated that employment rate is 1 to 50 inhabitants. From a small plot of 100 to 250 People get a net income up to 200 US dollars per month, which exceeds the wage of a public employee. However unlike rural horticulture, urban and peri-urban horticulture is at risk if no adequate planning and conservation measures are put in place. Land and water are key resources that are scarcely available and are in competition for other uses. Uncontrolled application of pesticides and organic waste will result in soil and water table pollution.

900 hectares are legally protected and documented for UPH activities. Infrastructure and equipment are in place to secure irrigation and drainage for 1500 hectares allowing for 45,000 direct and indirect jobs to the benefit of 225 000 people. A micro-credit scheme is operational and has empowered so far 15,500 farmers and entrepreneurs. 255 farmer's organizations have benefited from the technical assistance of SENAHUP. Marketing collection and sales points have been constructed in 12 neighborhoods. UPH has been introduced in 25 schools through educational school gardens and has provided training for 9500 students and 80 school teachers

The farmers field school has been adopted as a training and extension methodology to ensure disseminate Good Agriculture Practices, product safety and environment preservation.



[Source FAO]

4.6 Vulnerability of the Urban Environment

4.6.1. Security of tenure and land use

A major challenge to the viability of UPA is land availability coupled with water access. UPA is influenced by rapidly changing land rights, uses, and values. To urban, and even some peri-urban farmers steady access to land, at affordable prices, is almost unknown. Looming over many urban farmers, both men and women, is the constant threat of losing access to their plot and being forced to stop production activities. In many areas non-farming households' inability to access land in the city is the major reason given for not farming.

As urban areas expand the increased demand for land and the change in land use puts pressure on land tenure arrangements which are often customary or informal with no link to formal

legal institutions. The rural poor in peri-urban areas are vulnerable to having their lands appropriated by others while migrants who carry out urban and peri-urban agriculture may have weak tenure security to the land they use.

Local governments can promote UPA on publicly-owned land, in congested slum and squatter areas, and on environmentally degraded land. Analyses have shown that there is a surprising amount of open spaces and usable land which could be allocated or leased for UPA/UG. Inventories and mapping need to be addressed, coupled with research on status and ownerships and potential use for UPA.

Land tenure is thus potentially a major constraint for UPA. The trend of land use conversion could impact the livelihoods of many urban poor. For example, at least 20 million people are engaged in different forms of urban and peri-urban agriculture in West Africa, and in many cities, 60-100 percent of the consumed perishable vegetables are produced within and around cities (Drechsel *et al.*, 2006). Many of these people will be kicked out from agricultural production in and around cities because of urbanization, which could increase the number of unemployed in cities. (FAO, 2008)

Around the majority of cities there is no real shortage of land but there is lack of pro-active management policies for land towards food security and sustainable urbanization. Since land is so valuable in both urban and rural areas, combinations of different land use approaches, in order to safeguard land for different purposes in the context of a long term and sustainable urban-agro balanced system is required.

In six cities in the LAC Region, the percentage of vacant land ranges from under 5 percent in San Salvador to nearly 44 percent in Rio de Janeiro. If all of San Salvador's "latent" vacant areas were included, the percentage of vacant land could increase to 40 percent of the total metropolitan area. On the whole, vacant land in the cities accounts for a significant percentage of serviced areas that could potentially house considerable numbers of people who currently have no access to serviced urban land. The majority of Latin American cities have no explicit policies or legal framework regarding vacant land. In those cities where some legislation does exist, such as Rio de Janeiro, it is basically limited to recommendations and lacks real initiatives. In Santiago, recent legislation has promoted increased density in urban areas, yet it is too soon to know the implications of these measures. References to the environment are also generally lacking in "urban" legislation. Vacant land could play an important role in urban sustainability. However, reaching this potential would depend on better articulation between environmental and planning actions, especially at the local level (Clichevsky 1999).

Open-space area within city limits in four cities of Latin America

City (population)	Open-space area	Observations
Quito, Ecuador (1.4 million in 2001)	35% in 2001	Suitability not assessed
Rosario, Argentina (0.9 million in 2001)	80% in 2003	Largely suitable
Santiago de los Caballeros, Dominican Republic (0.5 million in 2002)	33% in 1998	Plus another 16% used for UA
Cienfuegos, Cuba (141 000 in 2002)	10% in 2003	Plus another 8% used for UA

Source: Mougeot 2006

The use of land under power lines for urban and peri-urban agriculture offers a great opportunity for people needing productive land and for the power companies to keep the space open and clean. Public private partnerships are already ongoing for example in Lima. In *Dar es Salaam*, Tanzania, it was calculated that a strip of 4, 2 km length and a widths of 35-40 m can provide 350 families with land for gardening with average plot sizes of 400 m².

4.6.2. *Water scarcity and management*

Water scarcity is a globally significant and accelerating phenomenon for 1-2 billion people worldwide. This phenomenon is exacerbated in the urban and peri-urban environment, where the demand for water is increasing with the rapidly growing population and the improvements of living standards. Urban centers place increased pressure on the quality and quantity of local water resources.

Demographic growth and economic development are putting unprecedented pressure on the finite fresh water resources, particularly in arid regions. By 2025, 1.8 billion people are expected to be living in countries or regions with less than 500 m³ of renewable water per year per capita, and two-thirds of the world population would be under “*stress*” conditions (between 500 and 1000 m³ per year per capita). These concerns are also reflected in the Right to Food Guidelines which call upon States to, among other, improve access to, and promote sustainable use of, water resources and their allocation among users (Guideline 8C).

Both absolute scarcity of renewable water resources (in watercourses and aquifers) and relative scarcity of reliable water services are on the rise and this leads to a serious acute challenge for water scarcity in the 21st century. Under water scarcity conditions, water reuse can be a solution in optimizing water resources and can ensure a dependable and year round supply that would be available in urban areas for various beneficial uses such as supporting urban and peri-urban agriculture, when safety concerns are adequately addressed. Other ways to increase water availability is to take full advantage of rainwater harvesting, the improvement of on-farm water management: producing more with less water such as using drip and micro-irrigation systems as well as hydroponics systems.

As water shortage is becoming a problem for many cities in the world, urban and periurban agriculture is resorting to the use of untreated wastewater with its associated health risks. Through FAO’s Farmer Field School Training, safe reuse of untreated wastewater for agriculture production has been tested in Ghana where various options at farm, markets, and food-vendor levels were operationally monitored, farming adjustments and management measures trained and verified on the effectiveness in reducing health risks.



Population is only one driver of the increasing needs for freshwater resources, and its expected stabilization will not diminish water needs as dietary patterns change, ecosystem, domestic and industrial needs will continue to increase the total demand for water. Yet, the quality of water continues to be reduced by severe pollution from anthropogenic sources and erosion from land use changes, impacting on the capacity to manage water resources effectively in many parts of the world.

The world's food production depends heavily on the availability of water. Today, irrigation covers about 20 percent of the world's cropland, and it contributes 40 percent of total food production. Irrigated agriculture is responsible for approximately 70 percent of all the freshwater withdrawal in the world, and more water will be used for irrigation in the future to meet world food demand. After nature, agriculture is by far the second largest user of water on earth.

Agricultural water use and management contribute to sustainable urban and rural development and food security that include improved management of aquatic and terrestrial systems and improved productivity of crop, livestock, fishery and forestry sub sectors where water and land are critical prerequisites.

According to the environment, cities rely on water supply from ground water and surface water from lakes and reservoirs. Surface water, which in many cases is less expensive, is often the predominant water source; however, both ground water and surface water face the challenge of not only supply but water quality.

As African cities are growing fast, so are their water needs, thereby increasing the competition with agricultural use of water withdrawals. Infrastructure development for water distribution has often not kept pace with the rate of urbanization and has resulted in water access problems and high water prices.

The question is how can "Multiple Uses of Water Systems" be managed sustainably in cities for the various users domestic water supply, water for food, environment, energy, transport, tourism, etc.? And how can the concept of "multiple uses" be more recognized and further strengthened in their governance and quality to support the various intended uses?

The concept of multiple uses of water is attracting increased attention of decision makers and water professionals from different perspectives, of course domestic water and irrigation, but also power generation, environment and tourism, etc. Many water systems although designed to serve only one use have become de facto a multiple use system, serving much more uses and users than initially thought.

In this potentially win-win situation important questions on management remain unanswered to date: How to properly assess the various uses? How to value them? How to govern multiple use systems in the cities and surrounding areas? How to operate them? How to define, produce, deliver and remunerate the water services?

There are many different aspects of sustainable water management:

- emergence of conflicts among different water users (e.g. domestic versus agriculture, hydropower and fishing activities)
- increased need to improve management efficiency and to introduce water accounting mechanisms
- introduction of Integrated Water Resources Management (IWRM)

- introduction of water pricing mechanisms
- increasing concerns on water quality
- consideration of natural ecosystem services (including aquatic ecosystems such as wetlands)
- increasing pressure to deal with pollution and preserve the environment from untreated cities' wastewaters – industrial and domestic
- pressure to internalize the externalities (water quality and pollution, water born diseases and health in cities and rural areas and their linkages)
- basin management approach, upstream and downstream impacts.

All these aspects of water management are to illustrate the intricacies in the uses and functions at the system level where water trickles down throughout the landscape following complex pathways from the source to a number of users and beneficiaries.

Water resource allocation strategies are being developed for a more economically efficient and sustainable water utilization with special regard to reuse of poor quality water in agriculture. The beneficial impacts resulting from reuse of water in agriculture or for groundwater recharge, whilst conserving quality water for domestic consumption, foster a more rational water use and play a central role in developing cost-efficient strategies and effective water pricing.

One way to increase water availability is to take full advantage of rainwater harvesting and secondly to establish water treatment plants in order to meet the FAO-WHO quality standards for irrigation. The quality and quantity of water supplied to the city also depends on its connectivity with its surrounding environment, requiring adequate watershed and ecosystem management.

A direct effect of urban trees on human health is in reducing air pollution. Urban trees as elements of beautification and recreational space also contribute to reduce stress, improve social ties, as well as physiological and mental health. The economic benefits from these environmental functions have been demonstrated around the world, such as in terms of i) significant savings in energy for cooling and heating; ii) savings in rehabilitation works by mitigating storm impacts (wind and water runoff); and, iii) increasing property values.

Farming with Wastewater Irrigation in Hyderabad, India

“In Hyderabad, about 600 million liters per day of wastewater enters Musi River which is subsequently used for irrigating para grass (used as a fodder grass), leafy vegetables and paddy along the ‘Musi River Corridor’. A number of small and medium scale industries also release their untreated effluents. According to the Landsat image February 2005, about 2108 ha para grass in and around Hyderabad and approx 10,000 ha of paddy along the ‘Musi River Corridor’ is irrigated with wastewater. Preliminary studies conducted by IWMI show that there is a very small area under wastewater irrigated peri-urban vegetable production mainly by women farmers. However, fodder and vegetable production contributes significantly to livelihoods and food security of resource-poor urban and peri-urban women and men. In and around Hyderabad, women constitute the majority of both vegetable producers (they rent the land) and vendors. Women tend the buffaloes and men harvest or purchase the fodder. Livestock rearing is on the rise in these regions. The use of wastewater in fodder and vegetable cropping systems has been shown to be beneficial for farmers as a result of the reliability and fertilizer value of wastewater that may result in considerable savings in inputs translating into higher incomes. Furthermore, there is a chain of beneficiaries who depend indirectly on wastewater for their livelihoods (and who are usually not

accounted for in the value attributed to wastewater such as landless laborers who work in agriculture or in animal husbandry. In Hyderabad, it was found that households that produce vegetables saved 20% of their total food expenditures by retaining part of the produce for household consumption (Buechler and Devi, 2003). Further, Para grass production and sale contributes about an estimated annual income of US\$ 4.5 Million or Rs 202 Million to the local economy of Hyderabad (IRDAS, 2005)” RUA Foundation, <http://www.ruaf.org/node/507>.



Vegetables gardens.

[Source: <http://www.ruaf.org/node/507>]

The good practices of design, selection and management of the tree resources systems need to respond to these environmental issues. For instance:

- The use of waste water for tree systems irrigation, should be in line with safety and health guidelines;
- The maintenance of greenbelts, hedgerows and windbreak plantations for wind and temperature control (e.g. reducing sand encroachment and regulating the microclimate).
- The selection of species resistant to air pollution.
- The protection of forest and tree cover surrounding the cities against degradation and land use change due to the urban pressure for wood material, fuel-wood and built-up land.
- The protection of biodiversity.

The art of developing a sound network of trees, tree lines through residential, industrial, private and public areas, is not only that of the “urban architecture landscape”, but also that of the “integrated forest and agriculture landscape”. The resulting mosaic of agro-forestry systems, street trees, gardens, forests and recreational parks, is a challenge for the cities to respond to the environmental and health needs of the cities, communities and people.

4.6.3 Health and sanitation

The safety of urban and peri-urban agricultural products is heavily determined by the implementation of good agricultural practices (GAPs) aiming at reducing the contamination from soil, agricultural inputs, manipulation, tools, harvesting and storage etc. GAPs include practices improving conventional production and produce handling methods - starting from the selection of the soil to be cultivated, which is indeed an issue in urban contexts, and even more in peri-urban contexts where industries can heavily contaminate soil and environment- and activities related to production and handling of fresh products in the field, always stressing safety. GAP in primary (i.e. agricultural) production, relies on hazard identification and detection of appropriate prevention and control practices, which involve an awareness of the different food safety hazards and their root causes, often lacking with farmers. However, product safety modules are now integrated in farmer field schools training curricula, and this will certainly help in empowering urban farmers to analyze themselves the conditions in which they work and their impact on the safety of their products.

Applying GAP includes identifying different production hazards, selection of recommended practices avoiding produce contamination, protecting the environment and workers health. It is therefore important that the following elements be carefully taken into consideration:

- soil history (is there or was there an industry on this location or around? is it subject to floods by contaminated waters?);
- water resources and irrigation practices (quality of water used, to which extent is this water in contact with the edible parts of the agricultural products etc); associated water sources (surface waters, reservoirs etc);
- pesticides choices and use (respect of doses, formulation, calendar of application);
- types of fertilizers used (in particular when applying animal manure- use the right composting method; storage location and modalities) Sometimes unprocessed liquid waste (e.g. pig slurry, flush waters) or semi-processed waste is used for fertilization. Raw chicken and cattle manure is often used to enhance soil fertility and structure.

These practices imply some health risk, but when properly managed, the risk can be minimized and the wastes be used as a valuable nutrient;

- (domestic and farm) animal access to the fields: can be a source of contamination; should be monitored;
- training of workers, and access to toilets.

Ideally, applying GAP relies on the previous implementation of Integrated Crop Management (ICM) and Integrated Pest Management (IPM) programs, pointing to practices producing economically and viable foods, not affecting natural resources. Main components for these systems are:

- applying soil conservation and minimum tillage techniques;
- using self-fixing Nitrogen plants, green fertilizers and soil agro-forestry conservation techniques;
- integrated pests and diseases control methods (involving cultural, physical, chemical and biological controls);
- crop rotation;
- productive use of plants and animals waste;
- preserving biodiversity;
- minimal use of external inputs and non-renewable energy resources.

A growing city will produce increasing amounts of wastewater and organic wastes. For most cities the disposal of wastes has become a serious problem. Urban and peri-urban agriculture can help to solve such problems by turning urban wastes into productive resources.

In many cities, local or municipal initiatives exist to collect household waste and organic refuse from vegetable markets and agro-industries in order to produce compost or animal feed. However, farmers also use fresh organic waste (which may cause environmental and health problems).

WHO/FAO's Safe Guidelines for the Safe Use of Wastewater for Agricultural Production includes FAO's field tested capacity building modules for training in non treatment options via Farmer Field Schools and Extension Trainings. FAO has conducted field implementation and developed Farmer Field School modules of various non-treatment options of wastewater at farms, markets and food-vendors levels and measured the effectiveness of different combinations of measures in reducing health risks and quantification of the risk reduction. Through field programs, FAO assisted UPA monitoring and institutional frameworks and assessed institutional capacity needs with gender balance to effectively implement and monitor non-treatment measures as well as treated wastewaters in Sub Sahara Africa.

4.6.4 Waste management, contamination

Due to a lack of awareness or decision making, and inadequate infrastructure solid waste, without previous segregation, is disposed of by dumping in open spaces and surface drains. Pollution from the rapidly expanding cities poses major threats to the environment and public health. Between 20 and 80 percent of the solid waste in African cities is disposed of by dumping in open spaces. In Asian countries, open dumping is the most common practice at least until the early 2000, 75% in the Philippines, 70% in Vietnam, 80% in Myanmar (UNEP 2004). Growing cities will produce more and more wastewater and organic wastes. For most cities the disposal of wastes has become a serious problem. Urban and peri-urban agriculture is part of the urban ecological system and can play an important role in the urban environmental management system, actively preventing waste dumping, absorbing urban waste and turning illegal waste dumping sites into productive open spaces, while transforming the organic waste materials into compost for sustainable soil fertility management.



Lima, Peru

According to the situational assessment of urban agriculture in Villa Maria del Triunfo (one of 43 districts that make up the capital of Peru) carried out within the framework of the Cities Farming for the Future Program (CFF), the most common urban agriculture practices are: Producing inputs, like organic fertilizer (compost) and seedlings; Growing crops and livestock, 83% of the farmers produce vegetables, 45% fruit, 31% aromatic plants, 18% ornamental plants and 52% raise small animals, mostly to contribute to household food security; Product transformation, 20% of the farmers occasionally process their products (jellies, jams, sweets); Commercializing products, 20% of farmers sell their products within the district itself. (MERZTHAL & SOTO 2006)



Available spaces, e. g. land under high-tension wires, can be used for urban agriculture (left) otherwise used as an illegal dumping site (right). (Photos Drescher, June 2008)

The municipality of Lima has developed a City Agenda for Urban Agriculture (2007-2011):

<http://www.ipes.org/au/pdfs/publicaciones/folleto%20villamaria.pdf>

[Source: RUAF Foundation]

Rosario, Argentina

Rosario in Argentina is a lead city of Urban agriculture. Through the Social Promotion Secretariat, the city has aided the development of the urban agriculture sector by creating four city farmers markets for urban agriculture produce, funding the construction of two small agro-industries and also by employing an entrepreneur who has strengthened links between farmers groups and the municipal government. It is an integrated strategy and includes researchers, practitioners and policy makers.

“Vermiculture training and environmental education have resulted in a local ability to convert organic waste into biofertilizer, as well as an appreciation of the environmental problems of the neighborhood and the establishment of a project to create an urban-hygiene cooperative. The most important result (of the research project) is the increase in self-esteem of the participants (mostly women)” (SPIAGGI 2005: 199).

The City of Rosario created the *Urban Agriculture Program* in 2006, which assists urban farmers in securing and protecting agricultural spaces, taking advantage of value-added agricultural products, and establishing new markets and market systems. There are currently 600 groups of producers involved, each of around 10 persons (TERRILE & LATTUCA 2006).

In Rosario, in the province of Santa Fe in Argentina, the Urban Agriculture Programme has been implementing an urban kitchen gardens project that has helped improve food security in the city, generated income for urban poor families and transformed uncultivated land into productive spaces (...) Since the programme started in 2001, 791 urban kitchen gardens have been set up, providing employment to over 5,000 families. An additional 10,000 farmers are directly linked to the production of chemical-free vegetables that feed over 40,000 people in this city with a population of 1.3 million. The programme has also led to the creation of a network of 350 groups that participate in local fairs where the produce is marketed and sold [UN-HABITAT 2006: 107].

5. Major issues for sustainable UPA

5.1 Awareness raising and advocacy

There is a growing awareness of the need for city and local authorities - i.e. regional, metropolitan, municipal and other local government institutions directly concerned with urban development - to play a proactive and coordinating role in alleviating urban food insecurity, as confirmed by various declarations.

The number one endeavor of FAO is geared towards creating awareness for policy makers about the risks and opportunities of UPA and the need to integrate it in agriculture development strategies, national food and nutrition programs and into urban planning and resources management. This effort is supported and enhanced through the Food for the Cities working group (FCIT) with a specific objective to facilitate knowledge sharing not only within FAO but also among countries and institutions worldwide.

FAO has produced various publications, such as the “*Food for the Cities. Food Supply and Distribution Policies to Reduce Urban Food Insecurity. A Briefing Guide for Mayors, City Executives and Urban Planners in Developing Countries and Countries in Transition*”, aimed to assist city and local authorities, to formulate urban food supply and distribution policies. The goal is to facilitate the right to adequate food for all. It is often a matter of city and local authorities doing what they already do but in a better way.

The need exists for a proper understanding of local conditions combined with a perspective of urban development. Cities are urged to apply an interdisciplinary, multi-sectoral and participatory approach to find sustainable solutions. The direct involvement of the private sector in planning decisions and their implementation is an essential requirement for sustainable impact. FAO is ready to share its experience with local decision makers and actors from public and private sector, including NGO’s, growers’ representatives aiming at establishing a multi-stakeholder consultative platform (<http://www.fao.org/docrep/003/X8296E/x8296e00.HTM>).

Dakar Declaration

“We recognize the important role which African cities and local authorities can play in ensuring urban food security. We stand ready to undertake, in partnership with all concerned stakeholders:
the identification of institutional responsibilities to facilitate stable food access to urban households;
the promotion of required research to improve the efficiency of food supply and distribution systems;
the adequate maintenance of market infrastructure;
the promotion of cooperation and partnerships with rural and periurban areas;
the availability of market information.”

DECLARATION BY THE AFRICAN MAYORS PARTICIPATING AT THE FAO-ISRA SUB REGIONAL SEMINAR “FOOD SUPPLY AND DISTRIBUTION TO FRANCOPHONE AFRICAN CITIES”.

DAKAR, SENEGAL, 14-17 APRIL, 1997

Medellín Declaration

“The need to increase access of all consumers, and low-income consumers in particular, to healthy food through participatory and intersectoral programmes designed to strengthen the efficiency of private systems for the supply and distribution of low-cost food and employment creation.”

DECLARATION OF THE MAYORS AND MUNICIPAL HEALTH OFFICERS AT THE
3RD CONGRESS OF THE AMERICAS OF MUNICIPALITIES AND HEALTHY COMMUNITIES.
MEDELLIN, COLOMBIA, 8-12 MARCH, 1999

Barcelona Declaration

“We recognize the importance of ensuring access to food by low-income constituencies in low-income countries as a main objective of local development policies and programmes, following the recommendations of the World Food Summit, held in Rome in 1996.”

DECLARATION BY THE MAYORS, CITY EXECUTIVES AND REPRESENTATIVES OF CITY AND
LOCAL GOVERNMENTS AT THE 34TH WORLD CONGRESS OF THE INTERNATIONAL UNION OF
LOCAL AUTHORITIES.

BARCELONA, SPAIN, 20-24 MARCH, 1999

Several international organizations came together in the mid-1990s to support the inclusion of urban agriculture (UA) initiatives in local development strategies. An Action Plan for urban agriculture (UA) development in Quito has been developed and discussed in a multi-stakeholder forum and a Quito Declaration on UA was formulated and signed by 40 member-cities in the framework of an IDRC project, which formed part of a regional initiative to develop participatory processes of local planning in ten municipalities throughout Latin America and the Caribbean.

Besides FAO, other UN Agencies which have traditionally targeted renewable natural resources and put emphasis on rural environments are now investigating the relation between the urban and rural and introducing in their programs, the urban and urbanization issues. Some example are: the Mayors’ Meeting on the Contribution of Cities to the Achievement of the 2010 Biodiversity Target on Biodiversity and Urban Issues held in Curitiba (Brazil) on the occasion of the Eighth Conference of the Parties to the CBD⁹; the current work undertaken in the framework of the Multi-Year Programme of Work of the United Nations Forum on Forests (UNFF) toward the session UNFF 10 in 2013, where the sub-theme “Benefits of Forests and Trees to Urban Communities” will be addressed under the Forests and Economic Development theme¹⁰. UN-Habitat, ICLEI¹¹ and UCLG are integrating programs and activities on climate change and disaster management programmed which are opening the door for the optimization of tree cover.

⁹ COP-8, 20-31 March 2007 <http://www.cbd.int/meetings/cop8mop3/>

¹⁰ <http://www.un.org/esa/forests/multi-year-work.html>

¹¹ “Talking Trees – Urban Forestry Toolkit for Local Governments” by Local Governments for Sustainability (ICLEI), November 2006.

UNDP; URBAN MANAGEMENT PROGRAM (UMP- LAC); UN-HABITAT; FAO of the UN; IDRC; IPES; and Quito Metropolitano organized the “URBAN AGRICULTURE IN 21ST CENTURY CITIES” workshop.

The cities gathered in Quito, Ecuador, on April 16-20, 2000, on the occasion of the “Urban Agriculture in 21st Century Cities” workshop, have agreed to the following:

“DECLARATION OF QUITO”

WHEREAS,

Our cities are faced with severe problems of poverty, food insecurity and environmental degradation; Several Urban Agriculture experiences have been recently and progressively developed in Latin America and the Caribbean with the aim of increasing the intake of food, generating income and jobs for vulnerable urban populations, and improving food security and the environment; These experiences have limitations, but the trend is towards their consolidation and sustainability; and they deserve a broader support in view of their impacts on the standards and the quality of life of the populations in our cities.

ACKNOWLEDGING that

Urban Agriculture experiences in Latin American and Caribbean cities have limitations, but this is not an obstacle to acknowledge their significant contributions to the production of cities under precepts of equity, health and food security. These experiences reveal that it is possible to use local resources and technologies to help reduce the costs of urban economies and improve the standards and the quality of life of the population. The consensus reached by local and national actors is a strong incentive for Urban Agriculture. It is necessary to execute training programs for local governments and for urban farmers themselves in order to increase the efficiency of Urban Agriculture. It is necessary to disseminate and exchange these experiences in the Region in order to improve and strengthen efforts and reduce the costs of these programs.

ENCOURAGING

Cities to recognize the significance of the contribution of Urban Agriculture to social development approaches, generation of jobs and income, self-esteem, environmental improvement and particularly food safety, and to add them to their key development goals in a transparent and concerted way.

Local governments to become strongly committed with the development of Urban Agriculture, mobilizing existing local resources, institutionalizing Urban Agriculture and procuring its extension at national level; and to allocate municipal budget items to the execution of Urban Agriculture practices.

The execution of training programs for technicians and the community in general and encouraging local stakeholders by promoting exchanges between municipalities on regional, national and international experiences related to municipal Urban Agriculture policies, and to establish criteria and indicators that allow the systematization of experiences and facilitate decision making.

The inclusion of Urban Agriculture within territorial planning processes as an element for the multiple-use of land and environmental protection.

The development of Urban Agriculture for self-consumption as well as commercial purposes, via research, health and certification of organic products, the promotion of small agricultural business, and raising the awareness of consumers by UA sponsors.

The development of credit and financial policies and instruments for Urban Agriculture, with special emphasis on the most vulnerable producers, to supplement technical assistance programs. Research, dissemination, awareness raising and training in the alternative and efficient use of water; and regulations and agreements on the sanitary use of household waste water. To enhance and validate techniques for the use of solid waste in Urban Agriculture; training urban producers in techniques of reuse and recycling of waste; educating the community in the selection of waste at the source (formal and informal education), and fostering policymaking at local and national government levels to promote and regulate the sorting and use of solid waste.

RECOMMENDING

That new, broader and more frequent gatherings and exchanges are organized between our cities in order to develop linkages with other cities within our countries and to address municipal policies related to Urban Agriculture and Food Security. The execution of follow-up and assessments of existing experiences as well as of others that may arise in the Region.

URGING

Local governments to promote Urban Agriculture in their cities, develop tax incentives and other policies, and promote the collection of information on Urban Agriculture activities in their territorial planning processes. State and national governments to include Urban Agriculture in their programs to alleviate poverty, food safety, promotion of local development and environmental and health improvement. Technical and financial cooperation agencies to accord to Urban Agriculture the significance and specificity deserved by the promotion of sustained and sustainable development. The Urban Management Program for Latin America and the Caribbean, the IDRC, the FAO, the PAHO and the IPES to continue supporting Urban Agriculture experiences in the region.

WE REAFFIRM

Our commitment to improve urban management through the promotion of Urban Agriculture experiences in our cities, establishing the Working Group “Cities and Urban Agriculture in Latin America and the Caribbean”, with the goal of replicating and improving Urban Agriculture municipal policies and actions developed in Latin American and Caribbean cities as to enhance food security, address urban poverty, improve urban environment and health management, and develop more participatory and less excluding governance processes, as well as to protect urban biodiversity with the support of the Urban Management Program for Latin America and the Caribbean.

Our determination to produce and disseminate, at least once a year, methodology tools, guidelines and mechanisms that collect regional experiences and report on the formulation and execution of urban planning and land use, reuse of waste water and organic solid waste, credits for Urban Agriculture, transformation and marketing. Our will to jointly support the execution of City Consultations on Urban Agriculture, with the support of the Urban Management Program for Latin America and the Caribbean, the IDRC and IPES.

WE INVITE

All public and private actors of Latin American and Caribbean cities to embrace the practice, promotion and support of Urban Agriculture. All Latin American and Caribbean cities to join the Working Group on Urban Agriculture and to assume the ownership of this Declaration.

Quito, April 20, 2000

Further to Declaration of Quito, the cities and civil organization and cooperation agencies reaffirmed the principles and prepared a concrete list of activities as follow that were endorsed in the Declaration of La Paz signed on November, 23rd 2007.

The Ministry of Agriculture, Environment and Rural Development of Bolivia, Belgium Cooperation Agency, IPES, Government of El Alto Bolivia and FAO organized the “INTERNATIONAL SEMINAR ON URBAN AND PERI-URBAN AGRICULTURE ”.

The cities gathered in La Paz, Bolivia, on November 20 - 23, 2007, on the occasion of the “International Seminar of Urban and Periurban Agriculture” workshop, have agreed to the following:

“DECLARATION OF LA PAZ”

The main recommendations for direct enrolment at the municipal level were: to systematize the knowledge on UPA available at different countries and cities of LAC; to promote technological innovation and application regards UPA for food security and income generation; to develop training nutrition education to take advantage of useful cases of UPA applications; to promote the formulation and implementation of public policy for UPA at local and national level; to consider the promotion of the sustainable use of natural resources among the programmes, projects and policy for UPA.

[Source: FAO]

FAO Urban and Periurban Forestry International Meeting

“Trees Connecting People: In Action Together” - Bogotá, Colombia, 29 July - 1st August 2008

From 29 July to 1st August 2008, in Bogotá, Colombia, FAO convened an international meeting on urban and peri-urban forestry (UPF) entitled: “Trees Connecting People: In Action Together” (hereafter called the “FAO UPF Bogotá Meeting”).

The meeting gathered more than 50 experts from agencies and institutions worldwide, mainly coming from urban forestry, urban agriculture and urban development, governmental, NGOs and private sector. Representative from UN-Habitat and United Cities and Local Government (UCLG) were also present. Participants came from countries including Brazil, Canada, Colombia, Cuba, Denmark, France, Haiti, India, Italy, Malaysia, Mali, The Netherlands, Panama, Peru, Spain, United Kingdom, Uruguay and USA.

The main objective of this international meeting on urban and peri-urban forestry – with the theme “Trees Connecting People: In Action Together” – was to achieve a better understanding of the overall institutional, policy and networking framework, develop strategic advice to raise the profile of forests and trees on national, regional and global urban agendas, and define strategic opportunities to implement an adaptable and efficient Urban and Peri-urban Forestry Programme.

This first international meeting on urban and peri-urban forestry has promoted worldwide networking and action with special emphasis to poverty alleviation and food security in developing countries. It was concluded that there was a need for the development of International Guidelines for UPF in a collaborative and participatory process with international and national stakeholders as a pillar activity for international, regional and national networking, technology and knowledge transfer, as well as planning based on the inclusion of beneficiaries and promoters of UPF.

5.2 UPA in urban planning

Urban and peri-urban agriculture still largely remains an informal sector that is not being integrated in agriculture policies or urban planning. This makes it vulnerable and also unreliable and risky. Vulnerable because most producers have no secured tenure status which precludes any substantial investment in terms of infrastructure or soil fertility. Unreliable and risky, because it is often not supervised and exposed to the “innocent” use of pesticides and polluted water. In many instances the role of UPA is not yet fully acknowledged and not part of any public policy or intervention. Thus, there is a clear lack of agricultural extension services provided to the urban producers.

Conversion of agricultural land to urban uses is a particular concern, as rapid growth and escalating land values threaten farming on prime soils. Existing farmland conversion patterns often discourage farmers from adopting sustainable practices and a long-term perspective on the value of land. At the same time, the close proximity of newly developed residential areas to farms increases public demand for environmentally safe farming practices. Comprehensive new policies to protect prime soils and regulate development are needed. By helping farmers to adopt practices that reduce use of chemicals and conserve scarce resources, sustainable agriculture research and education can play a key role in building public support for agricultural land preservation (Drescher 2003). In the same way city councils create green zones for parks, botanical gardens and golf courses within the city boundaries. Equally they could integrate urban agriculture into the planning, leaving any option open to modify the land use in the future but at the same time maintain a buffer space for urban food production.

Urban forestry in the city of Curitiba

Curitiba is known beyond Brazil's national borders for its policies in favor of well-ordered urban development, a sophisticated public transportation system and environmental conservation. Curitiba has thus earned the status of a modern model city in Latin America. For the last 30 years, Curitiba has focused on its urban planning. A master plan for an orderly urban development was implemented in the beginning of 1971. The development of the master plan was supported by the IPPUC ("Research and Urban Planning Institute of Curitiba") and on-going discussions throughout society ("Tomorrow's Curitiba" seminars). Today, the city is moving forward to extend its solutions to the whole metropolitan area through, for example, "zoning and land use" with time lines for execution. A significant part of the population is involved in Curitiba's environmental programs, with most success booked in the communal planting project "Plantios Comunitários". In this project, people in a given locality plant native (fruit) trees with the support of the Environmental Education Department. When suitable areas are found, the Department contacts local representatives and involves them in the planning process. The areas designated for planting are always public areas, usually steep slopes or riparian zones threatened by erosion or inundation. The people are also provided with information about the tree or shrub species to be planted. . In a project called "Cesta Metropolitana" fruits are sold 30% below market price especially for poor people from peri-urban areas. These activities are not restricted to the city centre but have an emphasis especially on the periphery of the urban agglomeration.

[Source FAO, 2002. Expert consultation on enhancing the contribution of trees outside forests to sustainable livelihoods. Rome, 26-28 November 2001, Proceedings. FAO, Rome].

5.2.1. Mapping worldwide UPA status

So far much quantitative and qualitative production data on UPA are inexistent, or scattered and inconsistent. However, the following tables indicate the importance of this production type for all continents.

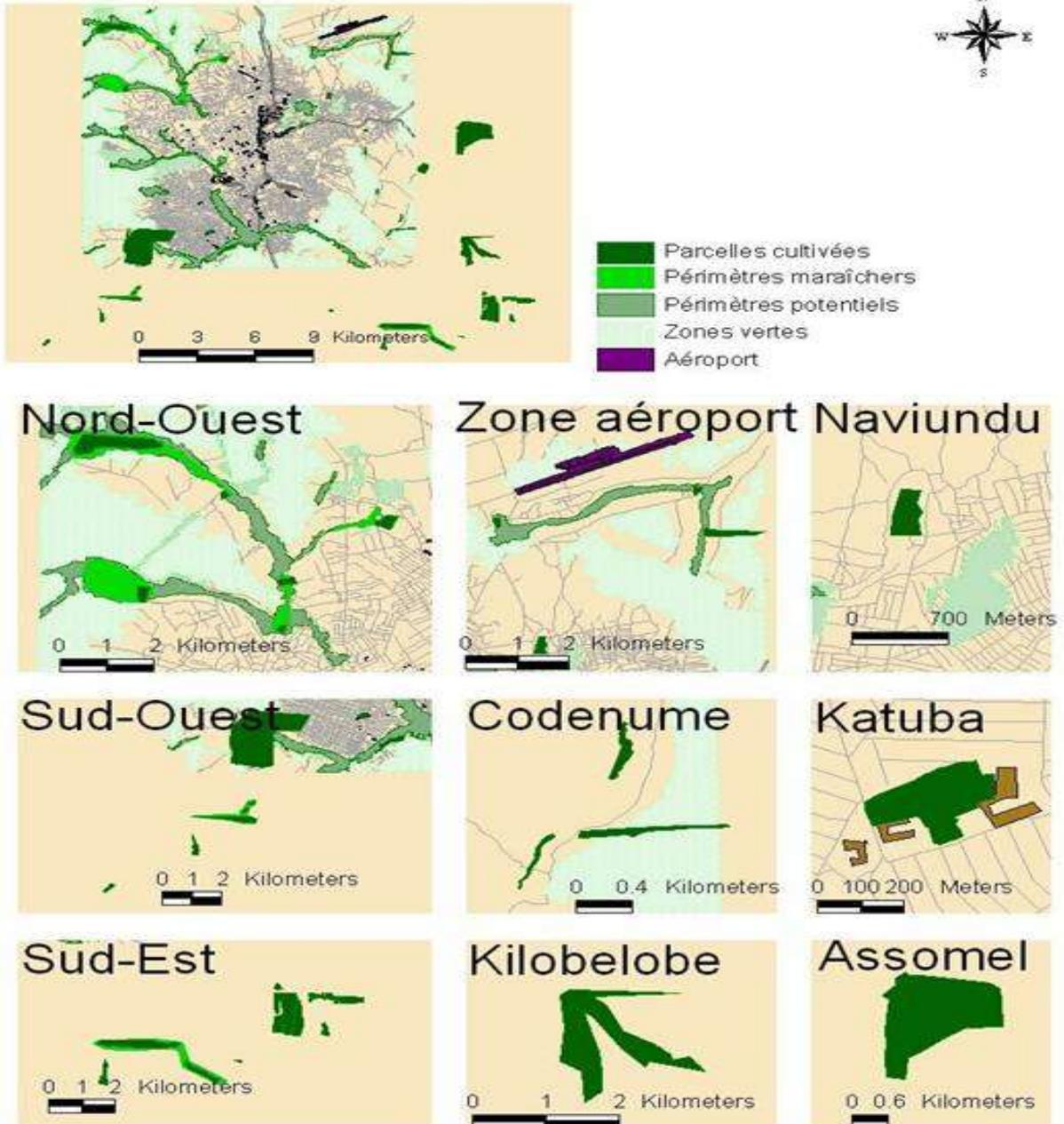
Selection	Number of Urban Farmers	Crop and Livestock Production	Area Cultivated	Average Plot Size
AFRICA				
Harare (Zimbabwe) Population: 1.9 million	Private property plots: 80% of all households in summer, 60% in winter ¹⁴	over one-third of households surveyed in Harare keep livestock, mainly chickens but also rabbits, pigeons, ducks and turkeys ^{24, 12}	4.900 ha open space cultivation in 1990 ³¹ 9.300 ha open space cultivation in 1994 (16% of city area) ³¹	Private property plots: up to 50m ² ; Public (e.g. open spaces): 200m ² ¹⁴ Periurban: 3 acres for smallholders, >5ha large-scale farming ¹⁴ On-plot-production in high density settlements: 2-25m ² , medium density: 15-105m ² , low density: 50-200m ² ²³
Nairobi (Kenya) Population: 2.0 million ¹⁵	25-30% (at least 150.000) of all households involved in UA ^{15,31} 1985: 29% of households growing crops, 17% raising livestock ²³ Agriculture is absorbing 24.4% of Nairobi's formal sector jobs, and provides the highest self-employment earnings in small-scale enterprises ³¹	Estimated: 25.000 cattle, 53.000 sheep and goats, 260.000 poultry, 9.500 pigs, 43.500 rabbits ¹⁵ 5.200 t of annual crop production in the mid 80s ¹⁶ 50% of food consumed by low-income households is produced within the city ¹⁵		99 m ² (mid 80s; including backyard farming) ¹⁵
Dar es Salaam (Tanzania) Population: 3.0 million ⁶	4000 (on urban open spaces) ¹ 35.000 families depending on income from UA in peri-urban areas (including part-time farmers) ⁵ 11% of population aged 10 or more, and 20% of all people in working age engaged in UA, thus UA second largest employer after small traders and laborers(1988) ^{4,31} 37% of families involved in UA ²⁵ urban agriculture forms at least 60% of the informal sector ¹¹ UA is second largest urban employer (20% of employees) ¹¹	agriculture in the city contributed substantially (almost 30 percent) in household food supplies3 74% of urban farmers keep livestock12 urban farming is the second largest employer after petty trade and labour12 10 000 UA enterprises11 90% of vegetables and 60 % of milk given to urban production in urban supply4, 27 incomes generated from urban agriculture were larger than regular salaries of 67 percent of the respondents4 100.000 t of food crops annually in whole city region (1988) 22 90% of all leafy vegetables appearing on urban markets come from urban open spaces and homegardens5 Urban animal production in 1999: 34.000 cattle, 12.500 goats, 6.500.000 chicken, 5.000 pigs 7,8 16% of urban milk consumption originates from urban production, 44% from peri-urban production 8	whole city region: 34,000 ha under crops in 1988 (23% of the area) ^{8,25} urban area: 650 ha on open spaces (4% of urban area) ¹	One farmer on irrigated plots: 700-950 m ² ¹ One farmer on rainfed plots: 4.000-5.000 m ² ¹ farm size periurban area: 2 ha (= 20.000 m ²) ⁸

LATIN AMERICA				
Havana (Cuba) Population: 2.2 million ³	117.000 people working in urban agriculture (overall government estimation) ³ >30.000 farmers on >8000 officially recognized production units in 1998, 80% of farmers are male ³	1998: 113.500 t altogether ² ; 25.000 tons of food/year from popular gardens ³ 14 kg/m ² on organoponic and intensive garden units (= 54.000 t) ³ 63.000 pigs, 170.000 birds, 3.500 female rabbits ³ 58% of vegetables produced nationwide are produced in Havana ²⁶	41%of total area of Havana is used for agricultural production (299 km ² of 721 km ²) ³ Other data says: 15.100 ha (151 km ²) under agricultural production ²⁶ >26.000 popular gardens on 2440 ha ³ 773 organoponic and intensive garden units on 386 ha ³	1200 m ² (community orchards) ²
Mexico City (Mexico) Population: 22 million (Metropolitan Zone) ¹⁷	20.000 farmers in the Federal District (0.7% of population) formally employed in UA ¹⁷	whole Metropolitan Zone: Livestock production on 3750 ha: 16.500 cattle, 19.300 sheep and goats, 583.000 poultry, 22.600 pigs ¹⁷ urban area (official census): 3.000 cattle, 1.550 pigs, 133.000 chicken, 4.300 rabbits ²²	303.000 ha of spring-summer crops in the urban area (official census) ²² 100% of the city's wastewater is used for irrigation ³⁰	
Montevideo (Uruguay) Population: 1.4 million ²⁹		15.000 – 20.000 pigs (6% of national production) ²⁹		
La Paz/EI Alto (Bolivia) Population: 1.5 million (La Paz); 1.0 million in EI Alto ¹⁸	4.000 farmers formally working in UA (La Paz), 2.000 formally in EI Alto ¹⁸ 1985: up to 55% of EI Alto's households raised small livestock for self consumption, and up to 68% grew food crops ³¹	30% (2.150 t) of La Paz's agricultural requirements are produced in UA ¹⁸	2.950 ha used for UA in La Paz ¹⁸	home gardens: 8-30 m ² ¹⁸
ASIA				
Cagayan de Oro (Philippines) Population: 0.5 million ⁹	Agriculture employs 9% of the economically active population ⁹ 13.000 farmers in the peri-urban area ⁹ 40% (95.000) of all households maintain backyard gardens	1995: 18.000 t of crop production on 2.280 ha (=0.8 kg per sqm) ⁹ 1995: 4.000 cattle, 3.250 goats, 135.000 chicken, 12.400 pigs ⁹ 70% of city's demand for fish is produced within the city ⁹	22.000 ha allocated by the city for agriculture (45% of total city area) ⁹ 2.280 ha under crop production (4.7% of total city area) ⁹ 55 ha under vegetable production ⁹	1.7 ha (average farm size), of which 0.5 ha are used for growing vegetables ⁹ 500-1.000 sqm in school gardens ⁹
Hubli-Dharwad (India) Population: 0.8 million ¹⁹		16.500 cattle and buffalo, 3.700 pigs officially (estimated no. of pigs: 20.000), 5.700 sheep and goats ¹⁹		0.6-0.8 ha ¹⁹
Jakarta (Indonesia)	100.000 urban farmers officially (1% of Jakarta's	27.000 t vegetables (9.5% of demand in Jakarta), 13.500 t rice (1.2% of demand), 44.500 t	11.000 ha (including 5.500 ha	

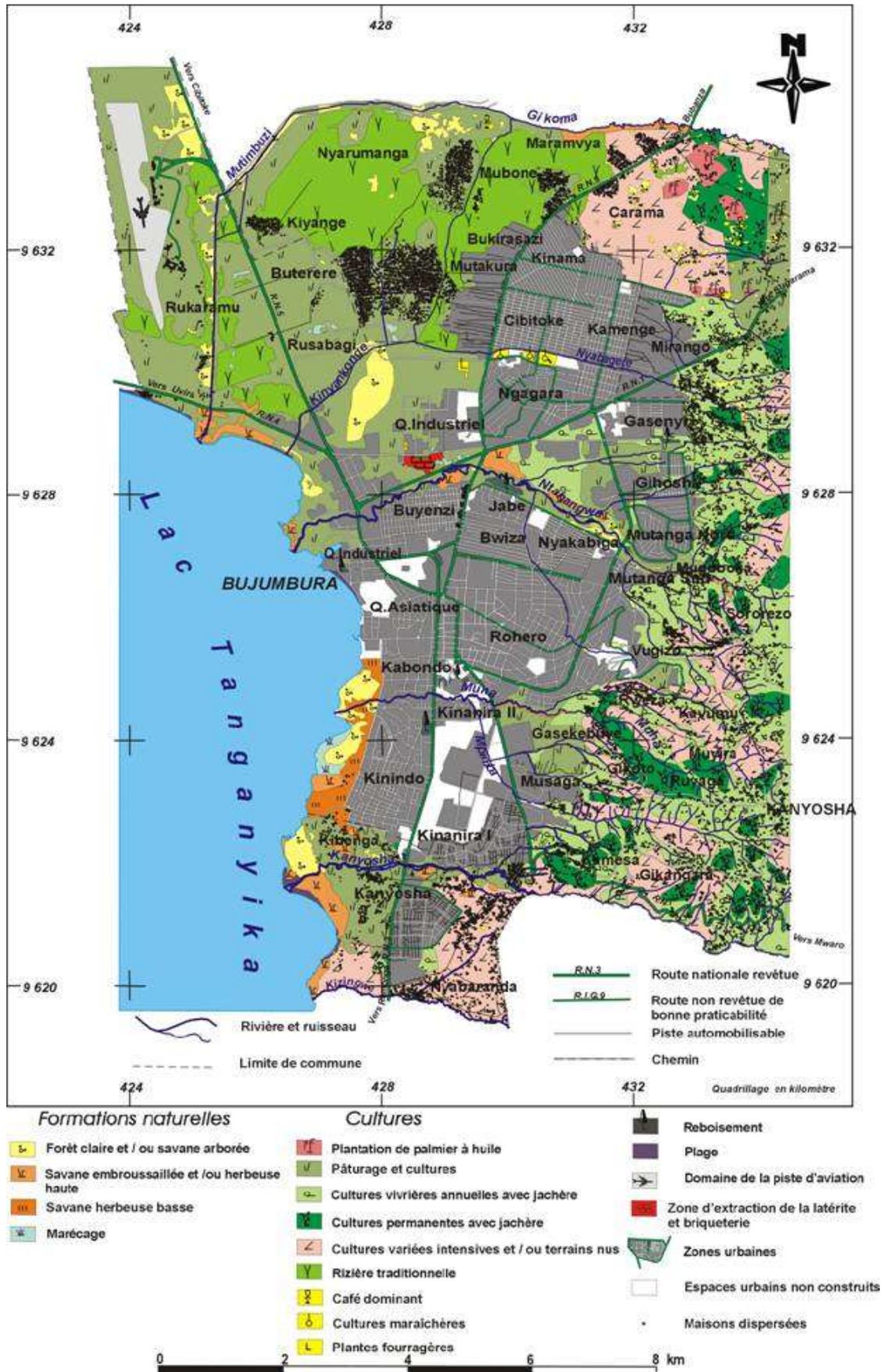
Population: 9.5 million 20	population) 20	fruit (19.6% of demand) 20 18% of food consumption of low-income households is produced within the city 25	home gardens) 20	
Singapore (Singapore) Population: 4.48 million	10.000 farmers licensed in fish, livestock and horticulture 24	100% of demand in meat, 25% of demand in vegetables 24	7.000 ha 24	
Shanghai (China) Population: 13.0 million 21	2.7 million farmers (urban, periurban and rural Shanghai) 21	2.400.000 t cereals, 1.300.000 t vegetables 21 60% of vegetables, 100% of milk and 90% of eggs consumed in Shanghai are produced within the city limits 21	553.000 ha, of which 66.2% (366.000 ha) are used for cereal production), 2.3% (12.700 ha) for vegetable production 21 10% (1270 ha) of vegetable production in urban and periurban area, the rest is 30-60 km from city centre 21 26.7% (3.400 ha) of vegetable production in greenhouses 21	

Compiled by Drescher & Jacobi (2002 and 2008)

Lubumbashi



Urban green zones and UPA areas in the city of Lubumbashi, Democratic Republic of Congo.



Urban green zones and UPA areas in the city of Bujumbura, Burundi.

Urban Farmers in Diverse Cities

AFRICA		
Ouagadoudou (Burkina Faso)	44% of urban population engaged in agriculture ²⁸	
Yaoundé (Cameroon)	35% of residents farming ⁴	
Brazzaville (Congo)	About one third of the Brazzaville households are involved in urban agriculture ²⁹	
Libreville (Gabun)	80% of families in horticulture ⁴	
Maputo (Mozambique)	37% of households in food production ⁴ , 29% in livestock production ⁴	
Dar es Salaam (Tanzania)	37% of families ²⁵	
Kampala (Uganda)	36% of the population involved in UPA ³⁰	20% of staple foods and 70% of the poultry products consumed are produced in the city; more than 50% of municipal area is used for agriculture ³¹
Accra (Ghana)	every second household is engaged in some form of subsistence production ⁴	
Kisangani (Dem. Rep. Congo)	>30% of households in UA ³¹	
Nairobi (Kenya)	25-30% of households in UA ^{15,28}	
Lusaka (Zambia)	45% of families ²⁵	average urban plot size in rainy season: 423 m ² ³¹
ASIA		
Suva (Fiji)	40% of families in horticulture ⁴	
Kathmandu (Nepal)	37% of households in horticulture ⁴ , 11% in livestock production ⁴	30% of vegetable consumption produced in UA ³⁰
Port Moresby (Papua-New Guinea)	80% of households in food production ⁴	
EUROPE		
Moscow (Russia)	1970: 20% of families engaged in agriculture ⁴ 1991: 65% of families engaged in agriculture ⁴	

Compiled by Drescher & Jacobi (2002 and 2008)

City	Urban Area	Peri-urban Area	Average Farm (Plot) Size	Gender Specifics
Latin America				
Santiago (Dominican Republic) ^b	Solares (plots): food crops, tobacco, small scale livestock, Home gardens: vegetables	Food crops, tobacco, livestock	U: 200-600 m ² PU : ca. 2 ha	U: men (crops), women (small scale livestock, home gardens) PU: dito ²⁾
Port-au-Prince (Haiti) ^c	Home gardens: Ornamentals, vegetables, medicinal plants crops, trees	Open spaces: crops, vegetables, trees, ornamentals,	U: 5 m ² - 1 ha PU: 100 m ² - 25 ha and more	U: Women and men PU: Men and women
Mexico City (Mexico) ^d	Home gardens, <i>parcelas familiares</i> , <i>solares</i> : vegetables, flowers, fruits Roof production Pigs	Grain, vegetables, forage, sheep, pig and poultry	Intensive use: 800-1000 m ² Extensive use: 0,5-2 ha	U: Women Whole family
Lima (Peru)	Home gardens, community gardens	Vegetables, tubers, trees, hydroponics, herbs, medicinal plants, livestock (PU)	U: 60 - 200 m ²	U: Women PU: Women and Men
Asia				
Hubli-Dharward (India)	Vegetables, small livestock	Livestock, vegetables, sewage based Farming System	PU: 6000 - 8000 m ²	Vegetables: Women, livestock: men and women
Vientiane City (Laos)	No information	Vegetables,	PU: 5000 m ²	PU: Women and men
Manila (Philippines)	Vegetables, fish, poultry	Rice	no information	U: Women (vegetables) PU: no information
Cagayan de Oro (Philippines)	40 % home gardens/ fish production	Crops and vegetables/ fish production	PU: 1,7 ha, 0,5 ha for vegetables	no information
Ho Chi Minh City (Vietnam)	No information	Crops, vegetables, sugarcane, rubber, gardens, orchards	no information	no information

“Pro Huerta” in Argentina

	1995	1996	1997	1998	1999	2000
Assisted Population	1290000	1901200	2265109	2898900	2615700	2478500
Family Gardens	181300	285500	342474	441496	404680	384400
School Gardens	4400	5600	6077	7033	6494	5832
Community Gardens	1800	2000	2444	2685	2432	2251

5.2.2. Legal framework for UPA

In many cities attention or legal recognition for UPA is growing. However, in most cases UPA is not yet formally recognized and, therefore, not integrated in any urban planning process. In contrast, where UPA is recognized as a legitimate activity by city authorities, it can be inserted into formal development policies and strategies and more easily benefit from the required assistance and monitoring.



Case studies on urban and peri-urban agriculture conducted in Quito (Ecuador), Toronto (Canada) and Harare (Zimbabwe) show that there are no specific regulations concerning urban and peri-urban agriculture within the legal framework of the municipality, despite the existence of laws and regulations on issues influencing urban and peri-urban agriculture, such as land use and water availability. In some North American cities, an examination of suburban development plans and official plan documents revealed that planning for urban and peri-urban agriculture was lacking in suburban development planning (Weckerle, G. R. 2001¹²).

Formal governmental recognized UPA programs exist in most cities of South Africa including the National Urban Greening Fund and the National Urban Greening Strategy of the Department of Water Affairs and Forestry. The final draft of the Public Open Spaces By-law of Johannesburg considers urban agriculture and stipulates the rules under which people may apply for permission to farm in an urban agricultural public space.

¹² Planning for urban and peri-urban agriculture in suburban development, Faculty of Environmental Studies, York University, Canada

Governmental and non-governmental bodies in many regions of the world have adopted several declarations in support of urban and peri-urban agriculture. Examples of these include the declarations of Dakar (Declaration adopted at a city consultation that took place in Dakar in March 2002 and brought together a variety of stakeholders from seven municipalities participating in the Francophone Network for Urban Agriculture in Sub-Saharan Africa) , Hyderabad (This declaration on wastewater use in agriculture is a result of a workshop held in November 2002 and co-sponsored by IDRC and the International Water Management Institute.), Quito (The culmination of activities in sustainable development of UPA led to the signing of the Quito declaration drawn up and supported by the ninety participants at the international seminar “Urban Agriculture in Cities of the 21st Century” that took place in Quito, Ecuador, in April 2000.) and Villa Maria del Triunfo (It was signed during a regional consultation of representatives of local governments, their associations and other stakeholders held in Lima, Peru, in September 2002.). These declarations are a commitment to contribute to the development of urban agriculture (UA). Local governments are now taking a leadership role in deliberating policy directions and action plans to better integrate UA in the urban landscape, e.g. by incorporating UA in their urban development plans.

These declarations affect UPFG to the extent that UPA and UPFG often overlap and interlink with each other. However, the mentioned declarations on UPA, contrast with the lack of specific declarations on UPFG, indicating that policy-makers at an international level are more aware of UPA as a more important issue to be addressed than UPFG.

Generally the legal framework for UPA is either non-existent or institutionally complex and confusing. Although public awareness for farming activities in cities is slowly increasing, agriculture is still in many cases “by definition” not legally practiced in cities, and is often seen as “economically unimportant” or “a temporary phenomenon”. The terms “agriculture” and “urban planning” seem to be incompatible in the minds of many. The reality is that UPA is “de facto” practiced in most cities of the developing countries.

In the past, cities tended to define urban agriculture as a problem (it was perceived as a nuisance and a source of health and environmental risks), often leading to restrictive policies. Nowadays, and in modern planning, the important potentials of urban agriculture receive policy attention and it is increasingly recognized that prohibiting urban agriculture is not the most effective way to reduce the associated risks. More attention is thus given to the identification of effective ways to facilitate the opportunities and overcome the constraints facing urban agriculture and thus to support development of sustainable and safe urban agriculture (RUA 2006).

The World Bank has tackled the question of urban agriculture within the discussion on urban poverty. Urban agriculture can be supported with respect to planning (Baharoglu & Kessides 2000) by:

- Reviewing the land-use planning and zoning decisions and adopting more flexible regulations.
- Regulations may need to be reviewed to see the extent to which they are relevant to urban poor and the city’s current economic and social context. In cities where urban agriculture is a common subsistence strategy, more flexible regulations could be adopted to help the poor develop urban agriculture rather than prohibiting it.
- Developing and disseminating information on land tenure and land capacity.
- Providing basic infrastructure, and developing and implementing environmental/public health measures against parasites and pests.

Additionally, experience gained from successful UPA initiatives in developed countries could be mobilized to benefit developing countries by:

- Lobbying in their respective national donor agencies to become involved in UPA; and
- Building links with non-governmental organizations in developing countries and offering institutional advice and support (Greenhow, 1994).

Some attempts have been made to formally organize UPA, the American Community Garden Association, for example, has developed guidelines to implement allotment gardens (American Community Garden Association, 1998). Part of these guidelines might be useful for developing countries as well. The transferability of the European allotment systems has been propagated at various conferences in developing countries and countries in transition (Drescher, 2001, Chatwin, 1998). In practice this means closer cooperation and new global partnerships between donor agencies, local governments and CBOs involved in urban agriculture on the different levels of support. The key elements to facilitate UPA are the simplification of institutional frameworks and responsibilities, and the proper institutionalization of UPA, as well as a broad-based participation of the different stakeholders.

Within the context of urban and peri-urban agriculture, cities, regions and other local institutions are increasingly recognized as active partners reaching out to their counterparts in poorer countries to help tackle urban poverty and food security. With the initial support of the Italian Government, subsequently followed by France and Spain, FAO started a pioneer Programme of Decentralized Cooperation (FAO DCP) in 2003 to mobilize the social, human and financial resources of Italian local authorities and support their efforts to promote food security. Since then a number of partnerships were established between cities in the north and their counterparts in the south for the joint identification, implementation and co-financing of projects of urban and peri-urban agriculture.

The municipalities of Rosario (Argentina) and Cagayan de Oro (The Philippines) grant tax exemptions to land owners who allow poor urban farmers to use vacant private land. The municipality of Governador Valadares reduced the tariffs for irrigation water and provides incentives for composting and reuse of household wastes. The City of Cape Town provides incentives in the form of the supply of irrigation water, tools and compost to poor urban farmers.

In Cagayan de Oro (The Philippines) a successful integration of UPA in the city could be realized through the formation of allotment garden associations according to a modified European system. 4 allotment gardens have been established through the assistance of an EU AsiaUrbs project, now there are 9. The city council has taken up the idea and supports UA with changes of city legal regulations and tax regulations for citizens owning vacant plots.

A key issue is the provision of land for urban agriculture with a long term perspective that allows sustainability and investment. This problem is currently addressed by several municipalities in different parts of the world.

There is a need to go beyond the reformulation of by-laws and ordinances and to design a comprehensive policy that makes use of various types of policy instruments. Also, much more attention is needed on the design of an adequate institutional and operational framework for the implementation and monitoring of the policy, since that defines to a large extent whether the policy will be effective or not (RUAF 2006).

5.3 UPA stakeholders and partnerships

Joining forces to strengthen urban development: Key stakeholders, Institutions, and networks

In 1999, the 15th Session of COAG recommended that an interdisciplinary and inter-departmental group be established on urban and periurban agriculture (UPA). In response, an Interdepartmental Working Group on Food for the Cities (IDWG-FFC) was established which incorporated technical units involved in the two domains of UPA and Food Supply and Distribution to Cities, to enable the evolution of a fully integrated and coherent programme of work. The Group is addressing activities aimed at providing linkages and developing synergies among FAO units working on urban food security and urban food systems, and linkages between urban and rural food production and distribution.

Partnerships are defined as voluntary and collaborative relationships between various parties, both state and non-state, in which all participants agree to work together to achieve a common purpose or undertake a specific task and to share risks and responsibilities, resources and benefits. (UN General Assembly, 60th session, Report of the Secretary General. UN Doc A/60/214). For urban agriculture this applies to close collaboration between communities, waste and water departments, urban planners, health authorities but also private companies and other stakeholders. A good way to create an environment to achieve mutual agreements and joint forces are multi-stakeholder platforms.

Multi-stakeholder platforms, sometimes called “partnerships” (MSPs) have been widely promoted as a promising means of resolving conflicts over natural resources, first in developed countries and, more recently, as a global good practice (Faysse 2006). These platforms are used and promoted in different sectors of development, e.g. water and catchment’s management, rural development and information and communication management. MSPs are becoming a very popular mode of involving civil society in debates and decision-making on resource management, as they provide a negotiating space for a diversity of interests (Warner 2007).

Multi-stakeholder Platforms on UPA have been developing in recent years. In some metropolitan areas of Brazil, such platforms or loose networks (mainly led by CBOs) do exist and promote UPA. Outstanding are Belo Horizonte and Sao Paulo.

In Villa María del Triunfo and in Governador Valadares (MG, Brasil), platforms exist to promote UPA. In Belo Horizonte and Bogotá they are in the process of development. This happens within the multi-stakeholder process initiated by CFF (Cities farming for the future) project implemented by the RUAF partners. Additionally in Bogotá and all the Brazilian states Food Security and Nutrition Departments exist. In Bogotá this is linked with the program “Bogotá sin Hambre” and in the case of Brazil with the National Policy for Food Security and Nutrition, which includes UPA.

In DR Congo and other African countries that have received FAO assistance to support UPA, municipal consultation platform (MCP) as a multi-stakeholder entity has been established. Its mandate is to moderate and make recommendations on the key issues related to sustainable UPA and more specifically to make decisions in the area of land and water use for UPA activities. In addition, MCP acts as a pressure group with the urban planners to fully integrate green spaces for UPA activities into a city development plan and make best use of available recycled waste materials. Stakeholders include central government authorities, public health and education representatives, municipal authorities, representatives of producer associations, inputs suppliers, land tenure authority, water distribution and use managers, NGOs, and micro-finance operators.

Urban forestry and greening networking, and partnerships

Networking, partnership and capacity building initiatives such as city twinning are essential tools supporting the development of local evidence-based policies and actions, based on research and practical experience. Existing initiatives include the EC COST Action E12 on Urban Forests and Trees, funded by the European Commission's Directorate for Research; the Resource Centre for Urban Agriculture and Food Security (RUAF) (www.ruaf.org); US-based NGO TreeLink (www.treelink.org); and the European Urban Forestry Research and Information Centre (EUFORIC, www.sl.kvl.dk/euforic); the International Union of Forest Research Institutions (IUFRO) working group 6.14.00 on urban forestry; United Cities and Local Governments (UCLG, www.cities-local-governments.org/uclg); the International Development Research Centre (www.idrc.ca) and its Guidelines for policy-making on urban agriculture in support of sustainable municipal development; IPES the Urban Management Programme for Latin America and the Caribbean of UN-Habitat (www.pgual.org); Africities "Building local coalitions for the implementation of the MDG in Africa Local Governments" (www.africities.org); as well as the FAO programme on urban and periurban forestry and the FAO multidisciplinary area group "Food for the Cities".

Some developing countries and countries with economies in transition have held national events on urban and periurban forestry, including for instance Bolivia, Brazil, China, Cuba, Malaysia, Mali, Mexico,

[Source: Adapted from: "Urban forestry and greening: towards achieving the Millennium Development Goals". Article p. 76-79. In: European Tropical Forest Research Network – ETFRN NEWS. "Forests and the Millennium development Goals" No. 47-48/07]

The number and composition of stakeholders directly or indirectly involved in UA differ from city to city, but include:

- different levels of government (national, provincial and local governments),
- relevant municipal departments and professionals (e.g. Parks and Gardens, Health Department and inspectors, Public Works, Urban Planning Department, Water boards, Departments for community development etc.),
- academic organizations and research institutes,
- local leaders and village councils,
- the private sector,
- non-governmental organizations, social movements, grassroots and religious organizations,
- male and female producers and their organizations, who are directly involved in agricultural production and related processing and marketing activities (farmers;
- Local producers of inputs such as grass, compost, equipment; transporters; processors; vendors on streets and local markets).

The following recommendations for a better integration of UPA in urban planning have been elaborated by Mougeot (2006):

- **Municipal governments should start with the right question: What can UA do for my city (not what can my city do for it)?** From composting, to environmental risk management, to community gardens, local governments often support or manage far more UA activities than they realize. There is real potential in making better connections between these activities.
- **Use UA to make suitable vacant space productive for all.** Municipal governments that have mapped their city's open spaces are amazed by how much space sits idle at any given time. Unused urban space is a wasted opportunity — an asset denied to a community's well-being and a brake on the city's development.

- **Include UA as an urban land-use category and as an economic function in your planning system.** UA is a dynamic land use that adjusts quickly to a city's growth and development. But it suffers from an image problem and is seldom recognized as a valid land-use category. To gain the full benefit from UA activities, this must change.
- **Use a participatory policy-making approach.** By involving a broad base of stakeholders, municipal authorities are more likely to develop policies that will meet the needs of both the municipality and its constituents, especially the disadvantaged poor.
- **Experiment with temporary occupancy permits (TOPs) for urban producers using private and public open spaces.** The use of TOPs overcomes a key problem: access to land for the urban poor. TOPs can be granted to groups or individuals, with land lent directly to producers by the landowner or indirectly through the municipal government or an accredited agency.
- **Support the organization of poor urban producers to manage UA in more and better ways.** UA workers and poor producers, in particular, cannot work as effectively as they could if they are not organized and recognized as legitimate. Municipalities have a clear stake in seeing that urban producers are better organized and better represented in local policy processes.
- **Bring the needed research in tune with your policy exercise at the earliest opportunity.** Research and policy steps should alternate one with another: one policy step guiding the next research step, which in turn will inform a new policy step, and so on.

5.4 Rural-urban linkages

Traditionally, development policy and related research have adopted a simplified concept of rural and urban areas, with the words *rural* referring to more "remote farming areas" and *urban* to "crowded cities." To a large extent, this view has facilitated the isolated treatment of issues affecting each space, and it has as a result failed to acknowledge the important poverty-reducing interlinkages that exist between the two spaces and the many variants of the spaces. In reality, farming areas (the very rural) and the megacity (the very urban) coexist along a continuum with multiple types of flows and interactions happening between those two spaces (Von Braun J., 2007).

The challenge of supplying nutritionally adequate and safe food to city dwellers is substantial. Accomplishing this task under conditions of growth and congestion demands that policy-makers seize opportunities for integrating resource management and planning efforts, understanding potential linkages between rural and urban areas, and anticipating the changing needs of a country's citizens - both rural and urban. Part of the reason for the observed growth in UPA is due to its adaptability and mobility compared with rural agriculture. As cities expand physically, and people from rural areas move to cities, the frontiers between urban, peri-urban and rural activity blur and merge, presenting opportunities for beneficial linkages.

Municipalities and governments spend considerable financial resources in restoring infrastructure (roads, industrial infrastructures, housing, etc...) as a result of lack of watershed and landscape management in chronicle or emergency circumstances. This jeopardizes the efficiency of food distribution between urban consumers and rural and peri-urban producers, and maintains it in vulnerable economical conditions. Funds invested in optimum land use and chain productions for small and medium production systems would contribute to mitigate these risks and related expenditures, as well as more reliable food production and distribution system.

Hence, as Africa and parts of Asia will become increasingly urban over the next 25 years, urban poverty and food insecurity will worsen if preventive measures are not taken. Treating "rural" and "urban" poverty as separate and in competition for resources is not only a conceptual mistake, but a remarkably short-sighted view of the problem. We have to overcome the mindset which counterpoises rural and urban development. Poverty knows no boundaries. Rural and urban developments are two sides of the same coin and no sustainable development can take place if rural-urban linkages (migration, land and water resource management...) are not given the appropriate attention.

It is essential to define the cases where UPA has a clear comparative advantage over rural agriculture. Broadly stated, a comparative advantage exists when either supply conditions or demand conditions allow UPA to better serve the urban market by supplying something otherwise unavailable or by producing at a lower cost, including environmental cost. In places where rural infrastructure is poor, or where farm to market systems are inadequate, UPA can fill critical gaps.

However, UPA should not be developed in competition with rural agriculture, but should concentrate on activities in which it has a comparative advantage, such as production of fresh, perishable foods. There is also a need of improvements in infrastructure and logistics of food chains to allow for reliable rural-urban supply linkages. To become effective, policies designed to address urban poverty problems, need to involve rural development policy issues as well. Cities are seen as engines of rural development, and the rural-urban linkage in UPA is increasingly recognized in the overall provision of agricultural produce, markets, and a range of support services essential for the increase of rural productivity.

As a result of its "proximity", UPA has de facto shortened the food chain, allowing for substantial savings in energy and other post-harvest handling expenses. Neighborhood markets, doorstep sales points and door to door marketing are marketing channels that have evolved as a result of traffic jams and restricted access to central markets.

5.5 Natural resources, energy and environment preservation

Doubts have been raised about the contribution of UPA to a city's environmental sustainability - in the sense of the quantity and quality of urban natural resources being maintained. Indeed, basic resources (water, soil) needed for agricultural production are in competition with other priority urban needs (drinking, domestic and industrial water use, infrastructure construction, etc.) There is real risk involved in food production in and near cities, just as there is also the possibility of improving the urban environment if food production and forestry are managed appropriately.

The optimum management of natural resources within and around cities is a sine qua non condition for sustainable urban and peri-urban agriculture. Urban agriculture and urban forestry need to merge their skills and conciliate their objectives in the context of the urban development planning and management. The options to be considered will come from the benefits of agricultural production of food and non-food products, an optimum distribution of the tree and forest component harmonizing the city within its ecosystem, watershed and landscape management. The interrelation between the evolution of land, food and citizens of today and tomorrow needs to be integrated by all stakeholders concerned.

The long-term viability of UPA itself depends on how successful farmers and urban officials are at exploiting the potential environmental benefits, minimizing the problems, and finding ways to secure growers access to land and water. Optimal management of urban and peri-

urban resources requires land use planning which views agriculture as an integral component of the urban natural resources system and balances the competitive and synergistic interactions among the users of the natural resources (water, land, air, wastes).

Although sufficient arable land is still available for agriculture at a global level, urbanization has brought about growing arable land scarcity in the urban environment. It is critical, when planning the expansion of cities, to take due account of the needed agricultural development, integrated natural resources management and rural-urban migration. Land policies should recognize and provide for UPA.

In practice there are several possibilities to safeguard land for UPA. City councils can provide unused open spaces or brown-fields (case of Germany and many other European countries), unused land under power lines (case of Lima and Belo Horizonte) or along railways can be reserved using public private partnerships between cities and companies, private land can be provided using tax exemptions (case of Cagayan de Oro), temporarily flooded areas can be reserved for UPA (case of Dar es Salaam), buffer zones for micro-climate conservation provide another option. Important pre-requisites are a) the political will b) the proper legal integration of UPA in city laws c) the proper organization of city farmers and d) the proper institutional designation of UPA.

Producing food close to its consumption source uses less fuel and should thus have a lesser detrimental environmental impact than traditional agriculture. For example, “When iceberg lettuce is imported to the UK from the USA by plane, 127 calories of energy (aviation fuel) are needed to transport 1 calorie of lettuce across the Atlantic. If the energy consumed during lettuce cultivation, packaging, refrigeration, distribution in the UK and shopping by car were included, the energy needed would be even higher. Similarly, ninety-seven calories of transport energy are needed to import one calorie of asparagus by plane from Chile, and sixty-six units of energy are consumed when flying one unit of carrot energy from South Africa.”¹³ UA is also considered much more efficient with respect to productive land use, in some instances thought to be as much as 10 times as efficient as rural agriculture.

5.5.1. Water resource management in context of increasing demand and climate change

Are rainwater harvesting systems and permeable surfaces lessening the effects of flooding and up-streaming the watershed management? A readily available source of water for urban and peri-urban agriculture would be recycled treated wastewater, provided it is used in accordance with reliable safety standards. The guidelines developed by FAO and WHO describe the levels of treatment needed for agricultural uses. FAO has been involved in promoting the safe use of treated urban wastewater for horticultural crops, i.e. floriculture and fruit crops. FAO has also been involved in projects in cities in arid and semi-arid zones which use waste water to irrigate forest plantations for purposes of combating desertification and providing fuelwood supply.

FAO (1992) estimated that typical wastewater effluent from domestic sources, when appropriately treated for agricultural reuse, could supply all of the nitrogen and much of the phosphorus and potassium that are normally required for agricultural crop production. Duckweed, a floating macrophyte used to clean wastewater, can be transformed into chicken and fish feed of high quality (International Bank for Reconstruction and Development, IBRD). Farmers may use wastewater for irrigating their farms when they lack access to other sources of water or because of its high price. The use of fresh (untreated) wastewater may have the advantage for poor urban farmers that it contains nutrients (although often not in the

¹³ <http://www.resurgence.org/resurgence/issues/jones216.htm>

proportions required by their soils and crops). However, without proper guidance, the use of wastewater may lead to health and environmental problems. Farmers need to be trained in self- protection during handling of the wastewater, proper crop selection and adequate irrigation methods, among other risk reduction measures promoted through FAO Farmer Field Schools. Technologies such as drip irrigation can substantially reduce water needs and health risks.

The treatment and reuse of more urban wastewater in agriculture needs to be promoted as well as the methane conversion to energy benefit recognized and intensified. This necessitates decentralized treatment facilities and low cost (preferably bio-) technologies. In well defined cases, partial treatment will be adequate for agricultural reuse, and FAO has conducted case studies on the economics of wastewater in creating incentives for water use efficiency and conservation. More and more experience is being gained in public-private initiatives involving private enterprises and/or civic organizations in the development and management of municipal wastewater treatment plants. However, in most municipalities, the treatment capacity is still far lower than what is needed and economic appraisal of the opportunity costs of the water resource base where competition between agricultural production and domestic water supply and sanitation is needed. FAO promoted economic instruments in water resource allocation for agriculture analyzes the cost-effectiveness of farmers in their preferred use of nutrient-rich raw wastewater versus the watershed cost-benefit analysis to urge municipalities, policy-makers and other actors to take proper accompanying measures and structured planning and negotiations.

The United Nations Framework Convention on Climate Change (UNFCCC) predicts that temperature may rise by about 3 degrees Celsius by the end of the 21st Century while the sea level could rise as much as 59 centimeters. Heat waves and periods of drought and heavy rainfall are very likely to become more frequent. UPA captures carbon dioxide and helps to lower the temperature through evapotranspiration. This will help to mitigate the effects of the air pollution and rising temperatures as a result of urbanization and climate change.

While almost all cities are exposed to the side effects of climate change, those at sea level are exposed to storm surges and hurricanes, e.g. Dhaka, Alexandria, Cotonou, Mombassa ... and many more in LAC and Asia (China, Bangladesh, Philippines, Havana, etc.). Floods and storms will lead to a rapid increase of urban poor since the floods and storms will be more destructive in the squatter settlements and slums.

It is therefore essential that Governments and Municipalities consider how climate change will affect their cities. Advocacy and capacity building will be required to help the policy and decision makers to understand the effects of climate change and to develop a strategy to meet the requirements for infrastructure and equipment that will allow offsetting the negative impacts. In other words, the productive land earmarked for UPA has to be protected against the extreme weather conditions by the adaptation of the irrigation and drainage facilities.

Urban agriculture is carried out in valleys, plains and hill sides that are prone to flooding (e.g. in Tanzania, Madagascar, Kenya and Nigeria). These areas, if planted with trees could be turned into great 'green lungs' and could be given added value for use as –agro-forestry area, recreational area while creating flood buffers for the existing housing areas. In cities where there is municipal waste treatment systems for both solids and liquids, there are opportunities in capturing methane which in turn can both reduce global warming and provide energy to the treatment system (turning waste into a resource for other sectors). Under Climate Change, land use and river management of cities are important.

Australia

Brisbane addresses climate change with urban agriculture and green roofs

Brisbane (Queensland, Australia) is the first city in the world to include both urban agriculture and green roofs in an action plan to meet predicted global climate change challenges.

The Brisbane City Council (BCC) adopted (May, 2007), unanimously; an action plan based on commissioned reports and its own sustainability studies over the last two years. Major parts of the action plan are aimed at reducing Brisbane's use of energy derived from fossil fuels and encouragement of more efficient use of water. But sensible, practical ways to mesh these aims with creating a new style of built-environment attracted enthusiastic votes for:

- Urban agriculture for greater food security and reduced cost of living.
- Green roofs that provide a built-environment attuned to climate change responses.

Both urban agriculture and green roof developments in their widest context were foreseen by BCC councilors as important for improving both living conditions for people during climate change, and to maintain and develop businesses and employment. In August 2006 Brisbane City Council appointed a Climate Change and Energy Taskforce to ensure that Brisbane is adequately prepared to respond to and address the challenges of climate change, increasing energy consumption, rising petrol prices and peak oil. **Goff Wilson**, President, Green Roofs for Healthy Australian Cities, and President, Urban Agriculture Network Australia. Email: Geoff @nettworx.info

5.5.2. Multipurpose urban forestry and greening

Urban and peri-urban forestry” have critical environmental functions, besides some food and non-food production functions. The intensification and extension of cities without taking into account the land-use capacity and the local need for wood building material and fuelwood, has contributed to a drastic depletion of tree and forest cover in and around cities. Cities consequently suffer from floods, dust encroachment, water shortage, soil erosion, etc. Therefore there is a need for a close dialogue between urban forestry, urban agriculture and urban development to ensure an integrated environmental and resources management approach

Urban and peri-urban forestry has an important potential role in addressing the social and environmental problems associated with rapid and uncontrolled urbanization in many parts of the world. In many countries large parts of the urban population are still heavily dependent upon fuelwood for their domestic energy needs. Fuelwood production is therefore an obvious function that should not be ignored in the design of urban and peri-urban forest systems. Urban plantations and green areas can also provide non-wood forest products.

WISDOM for cities – an Analysis of wood energy and urbanization aspects using WISDOM methodology

FAO's Woodfuel Integrated Supply/Demand Overview Mapping (WISDOM) methodology is being adapted to the context of urbanization and urban environment. The development process initiated shows that “WISDOM for Cities” is a useful tool for the mapping of sustainable resource potential and woodfuel consumption areas, identification of deficit and surplus areas and the pragmatic definition and visualization of areas influenced by the urban/periurban consumption of wood energy and definition of priority areas for intervention. The document discusses the link between urban forestry and wood energy and proposes to policy makers, decision makers and stakeholders the way forward to address the related issues and for the methodology development and application. The methodology is been developed through pilot initiatives such as during the process development of the Strategy and Action Plan for Urban Forestry of Bangui, capital of Central African Republic where fuelwood is considered as an important income activity and major factor of deforestation around the city.

[Source: FAO, 2007. WISDOM for cities – an Analysis of wood energy and urbanization aspects using WISDOM methodology]

To date, in the weak institutional and instable conditions of poor societies, most attempts in decreasing pressure on wood energy (fuel wood and charcoal) by subsidizing gas or electric technologies have not succeeded.

The prognostic for many regions, such as in Africa, is that wood energy will continue to be the main source of energy for cooking and heating of the majority of their population . An in-depth understanding of the relationship between urban, peri-urban and rural areas to guarantee the access of energy to growing urbanized populations is essential.

5.5.3 Disaster and Risk Management

As a result of the current attention to the World Food Crisis, urban and peri-urban agriculture is receiving significant interest and legitimacy in the eyes of municipalities all over the globe. Since the 1970s policy makers have encouraged backyard farming, institutional and school gardens in times of crisis. From La Habana to Lagos to Nigeria and from Freetown to Kinshasa, UPA has become a standard component of emergency agricultural response activities.

MICROGARDENS for TSUNAMI affected areas

Micro-garden technologies are receiving increased attention in the context of small scale horticulture in emergency situations. For their simplicity and adaptability they are spreading in urban environments, refugee camps, schools and health centers. With little or no soil and limited water, micro-gardens can rapidly improve the availability of fresh and nutritious vegetables while providing for an attractive and creative occupation requiring minimal physical efforts.

People with no land and no income can only rely on food distribution for their survival. The micro-garden systems can change their lives.

Starting with 1m2 of space and 1-3 liters of potable water per day, a family can grow a broad range of vegetables including leafy vegetables like: cabbage, lettuce, jute, cut lettuce, amaranth, rosel, basil, as well as root and tuber vegetables like: carrot, potato, red beet, onion, and fruit vegetables like: tomato, hot and sweet pepper, eggplant.

As a first priority, the micro-garden system encourages the families to "save" the little fertile soil and protect it from further erosion and practice "bed culture system". When no soil is available, the cultivation can be successfully performed with natural substrates elaborated from locally available materials such as peanut shells, coconut fibers, rice hulls, coarse sand, pozzolane, etc. In case the substrate is not available then it is also easy to grow the crops as "floating" directly on a nutrient solution.

A major reason why the micro-gardens are very popular for women is because their cultivation requires less physical effort as compared to conventional growing. In addition the system is highly water use efficient which again reduces the burden of carrying irrigation water but also helps to safe water which is expensive and scarcely available.

With the micro-gardens the Tsunami affected population can immediately engage and participate in rebuilding their future and harvest every day fresh, safe and highly nutritious vegetables for improving their diet with vitamins, essential micro-nutrients and vegetable proteins. It is suggested that Training and Demonstration Centers be established in camps, schools and health centers, where beneficiaries could be trained with the help of local NGOs if applicable. Families will be provided with a take-home kit in order to continue vegetable production at their homestead once resettled.



[Source: FAO]

UPA in Switzerland: learning from the past

Switzerland has offered to the world an interesting example of food security and subsistence, based on small scale and home-garden potato production. During the risk and emergency period that prevailed during the second world war 1939-1945. To face the awaited invasion by Nazi troops, the Chief Crop Production Officer of the Swiss Federation, Dr Wahlen, launched a national potato scheme to ensure Swiss self sufficiency for basic food. The plan is known as the « Wahlen » plan, which consisted in promoting potato cultivation in all free plots of home gardens, empty plots and public gardens. In this way Swiss people and individual families could rely on their own production for their survival nutrition during this crisis period.

[Source: Ciparisse G., Draft paper, FAO, Rome, 2005]

5.6 Economic and social sustainability

The sustainability of Urban and Peri-Urban Agriculture can be appraised from two angles; firstly, from a strictly “economic” point of view, and secondly including some humanitarian and social dimensions as a component of the urban food, socio-economic and socio-cultural safety nets. The appraisal of the economic sustainability in sensu strictu of UPA would not differ much from economic sustainability of rural agriculture. Nevertheless, it will depend on the “urban value” of some of the principal resources like: land, water, and labor, which are in competition for other uses in the urban environment. Therefore, the economic sustainability of UPA in the urban environment will depend on the adoption of specialized and intensified technologies that make best use of these resources. The high costs of “urban inputs” may to some extent be compensated for by the better prices obtained at the farm gate and the short marketing chain as compared to rural agriculture.

New York City, USA

The following programs address issues of food security, environmental sustainability and economic development through job creation and training in New York City:

“East NY Farms”: “ENY Farms! began in 1995 as a vision of a community-based food production, economic development and greening initiative. As we start the market season in 2002, participants include gardeners from nine community gardens, three backyard gardeners, nine local craftspeople, and three upstate farmers who supply significant amounts of fresh produce to the East New York Community at reasonable prices. Our gardeners and farmers also contribute to community food access through their participation in the WIC and senior farmers’ market coupon programs. Through this program, coupons that are redeemable for fresh produce only at farmers’ markets are distributed to seniors and women with young children in the community. In 2002, most of our participating farmers are also eligible to accept EBT (electronic benefits transfer), allowing them to serve consumers who are on public assistance”

(<http://www.neighborhoodlink.com/org/enyfarm/>).

“Added Value” in New York City: “Red Hook Community Farm working with the New York City Department of Parks and Recreation, Added Value is transforming a once dilapidated playground into vibrant community resource where young and old work, study and grow together as they sow, nurture and harvest plants on a 2.75 acre urban farm. Operated by our staff, youth leadership team and a dedicated core of volunteers and interns the Farm is a vibrant intergenerational space and experiential educational environment for all. Food grown on the Farm is sold at our Farmers' Markets, to local restaurants and donated to those in need. Today the Farm provides sustenance to residents, creates meaningful work for neighborhood teens, generates economic activity and improves the health and well-being of our community”.

[Source: <http://www.added-value.org/initiatives.php>]

Generally speaking, the economic sustainability will very much depend on the type of activity that is being implemented and its comparative advantage with regard to rural environment. However, the economic sustainability is more easily attained with high value of commodities and the highly efficient use of space, water, and land. This is for example the case for the production of high quality vegetables, condiments, and even ornamental plants, where commonly one third of the yield covers the expenses incurred, leaving the balance for additional income or home consumption. In cities like Bogotá, Colombia the daily production and consumption of a micro-garden of only 4m² can provide an estimated savings of US\$ 1.3 per day. A recent evaluation of the project “Micro-gardens El Alto” of El Alto, Bolivia confirms that families with some form of food production increased their consumption of fresh and fruit and vegetables by 85%, and diversified their basket of consumed species from 6 to 15 species. Leafy vegetables provide a quick return to meet a family’s daily cash requirements for purchasing food. Another example from Cagayan de Oro in the Philippines shows that 25 % of the vegetables produced are consumed by the family, 7 % are given away to friends and relatives while 68 % are sold to walk-in clients, who come mostly from the direct neighborhood (Holmer & Drescher 2005). The UPA sustainability in general includes not only the production, but other activities in the urban food supply chain. The commercial peri-urban production of livestock is an extremely fast-growing sector, representing 34 percent of total meat production and nearly 70 percent of egg production worldwide. With it comes expansion in food processing activities in the peri-urban zones, which, while providing employment, and will add to the overall sustainability of UPA.

On the other hand UPA can play a special role by providing an opportunity to integrate unemployed and resource-less migrants, who have come to live in the suburbs into productive activities. As mentioned earlier in this paper, a large proportion of the urban population increase is living in slums. And, their survival often depends on emergency initiatives and food distribution. In this context UPA activities can be an alternative or a complementary strategy to reduce their dependency on food aid and allow these urban squatters to practice agriculture activities to partially complement their diet and provide a minimum of cash income. At the same time, their involvement in productive activities will help to contain urban violence and social deviance, in a way that people is committed to these activities for improving their access to food and generating income.

In this context, UPA is not only to be appraised for its economic sustainability in *sensu strictu*, but also for its contribution to the social welfare and for the relief it can bring from total dependency on food aid.



6. Conclusions

UPA is as a productive and income generating farming system which should be seen as an integral part of the urban system, providing food and jobs, contributing to the urban ecology and competing for natural resources with other urban functions. UPA can also contribute to urban sanitation by recycling of solid and liquid wastes. Effective participation and capacity-building of UPA actors is essential to poverty alleviation and food security in cities, as well as sustainable urban development.

From lessons learned by working in several countries of the world, in different continents, FAO has derived a so-called **4-S strategy** that can be used as a framework to address the different issues related to sustainable UPA development.

S-1: Securing access to essential resources and inputs (land, water, seeds, agrochemicals, fertilizers ...);

S-2: Securing high product quality and safety (according to international norms and standards and through the implementation of good agricultural practices, including environmental and resources management);

S-3: Securing policy decisions, institutional context and appropriation by all stakeholders from Government officials to growers (including micro-credit ...)

S-4: Securing market outlet (promotion of consumption, nutrition education, distribution and marketing strategies ...)

Urban policies should give full recognition to UPA and develop appropriate strategies to ensure its sustainable development with appropriate measures especially in regard to land tenure, water resources management and pollution prevention. Their actual implementation is also a key component of Disaster Risk Management strategies in cities.

When carried out properly, with a full attention to environmental and food safety issues, UPA can contribute to food security in three ways.

(i) Firstly, the quantity of food available is increased through UPA. Poor urban dwellers often lack the purchasing capacity to acquire adequate amounts of food. Urban agriculture can reduce food insecurity by providing direct access to home-produced food to households and to the informal market. UPA can enhance food security during times of soaring prices and in times of socio-political insecurity. It plays an important role in emergency situation to rapidly restore production capacity and is therefore a component of the food safety net.

(ii) Secondly, UPA enhances overall nutrition security by diversifying the diet of the poor through the consumption of locally produced fresh and nutritious food and allows substantial savings on energy through proximity production with limited packaging, transport and storage requirements.

(iii) Thirdly, UPA offers opportunities for productive employment in a sector with low barriers to entry. UPA is estimated to involve 800 million urban residents worldwide in income-earning and/or food-producing activity. Urban agriculture is often carried out on a part-time basis by women, who can combine food production with child care and other household responsibilities. The intensive horticultural and livestock production that thrives in peri-urban areas employs workers and produces high value-added products that can be expected to yield reasonable incomes and returns. In particular, commercial peri-urban greenhouse production and livestock rearing are extremely fast-growing.

Issues arising in developing urban and peri-urban agriculture are how to:

- provide adequate access to nutritious food for the growing urban populations of the developing world;
- efficiently integrate urban and peri-urban agriculture with rural agriculture (in general they are not substitutes for each other);
- develop land and water policies that account for agricultural production in urban and peri-urban areas; and
- guide dynamic agricultural practices, within and outside cities, towards sustainability goals (economic, social, and environmental).

Institutionalization of urban agriculture: the key element of sustainability.

Issue	Household level	Institutional level	Policy level
Production, processing and marketing (both food and nonfood agricultural products)	<ul style="list-style-type: none"> • Farmer understanding of urban markets, and appropriate selection of farm and nonfarm enterprises. • Competent enterprise management. 	<ul style="list-style-type: none"> • Institutes to develop and monitor standards for agricultural practices and food quality. • Public-private sector collaboration for input supply and market infrastructure. • Technologies to reduce seasonality of supply. • Enable small enterprise integration with emerging food chain structures. 	<ul style="list-style-type: none"> • Recognition of the role of UPUA in urban planning, and appropriate price, trade, and land policies. • Policies for improving farmer access to information.
Livelihoods	<ul style="list-style-type: none"> • Targeted technologies to improve the livelihood of urban poor. 	<ul style="list-style-type: none"> • Recognition of the role of UPUA in economic crises. • Strengthening the backward and forward linkages between rural and urban agriculture. 	<ul style="list-style-type: none"> • Food and trade policies to reduce the impact of high food prices.
Environment, health, and equality	<ul style="list-style-type: none"> • Adoption of sustainable practices. • Monitoring pesticide residues. 	<ul style="list-style-type: none"> • Create awareness about fresh, hygienic, and quality food, and adopting food quality and safety standards. • Institutional arrangements to manage environmental and social externalities of UPUA (e.g. heavy metal and microbial contaminations of the environment and food). • Regulating use of city wastes. 	<ul style="list-style-type: none"> • Policies to encourage people to keep the city green. • Awareness of environmental perspectives of consumers. • Appropriate labor policies.

Source WB: Agricultural Investment Sourcebook
<http://www-esd.worldbank.org/ais/index.cfm?Page=mdisp&m=04&p=5>

In a world with rising food prices confronting climate change, Urban and Peri-Urban Agriculture is an essential element. Local governments can use it for public areas and slum sites, on environmentally degraded areas for promotion of health and improved food security. Alternatively, families that use UPA can obtain low cost, clean and safe sustainable food supply, that allows savings, employment and, with good agriculture practices, income generation.

The visible growth in urban and peri-urban agriculture throughout the world casts a spotlight upon some existing issues in agriculture and food security and raises new ones. These include a need for effective ways to deal with urban food insecurity, for basic infrastructure in urban areas to protect public health and the environment, and for integrated resource management and land use planning. The future habitability, competitiveness, and viability of the cities in developing nations will depend on whether decision makers and urban planners develop and adhere to coherent policies for managing their urban and peri-urban areas. Distinct policies and planning efforts are needed for the management of agriculture, horticulture, forestry and aquaculture in the urban and peri-urban environments. There are few models and little information available to city managers to address these competing demands, and to develop alternative visions of the future. While the interest, potential, and risks of UPA are clearly perceived, it is surprising to note that, in most cases, policy and strategy developments -- as well as technical guidance -- are still absent or only nascent. Strategic ways of dealing with the competition for water and land, as well as other environmental issues, are just emerging.

To ensure that UPA is adequately addressed and can play its role in food security and poverty alleviation programs, it is suggested that all agencies and partners join into a global multi-agency and multi partner initiative in support of UPA with the following framework for interventions: (i) Create awareness for policy and decision makers supported by a concept and methodological toolkit. (ii) Assist member governments and municipalities to develop national programs in the context of their national agriculture policy and city development strategies, supported by technological toolkits. (iii) Provide capacity building at different levels to help the implementation of national programs supported by training toolkits.

The challenge of feeding cities consists of creating the enabling environment for the investments needed to increase agricultural productivity, food processing and access to safe food. Meeting this challenge requires enabling policies to develop UPA with appropriate logistics for rural agriculture to allow for effective rural-urban linkages.

“WMO recommends countries invest more in urban and indoor agriculture that can assist greatly in providing food for the hundreds of millions of people living in the growing cities of Asia. In view of the growing populations in Asia and the need for secure access to food for these populations, indoor and urban agriculture is also receiving special attention to make most efficient use of space using controlled environments”

WMO Secretary-General Mr Michel Jarraud

City authorities should also undertake city-wide strategic planning to design and implement integrated solid and liquid waste management systems (including recycling options) that are responsive to dynamic demographic and industrial growth.

Key challenges:

- **Integration into urban management** — supporting and valuing UPA as an integral part of urban development and an effective tool for urban management;
- **Self-reliant local food systems** — actively supporting UPA through policies and research to develop a more robust urban food supply;
- **Productive green spaces** — helping to purify the air and bridge the inequality of access to such spaces between rich and poor;

- **Resource recovery** — recognizing the efficient treatment and reuse of solid and liquid wastes as a valuable resource for UPA; and
- **Producer access** — organizing formerly marginalized producers into groups that can more effectively negotiate access, utilize research findings, and market their produce at a fair profit. (Source: IDRC Luc Mougeot, Better Cities).
- **Consumer access**—giving consumers/city residents access to fresh locally grown food in their neighborhoods.

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List of key stakeholders on UPA

FAO – Food for the cities

<http://www.fao.org/fcit>

RUAF

<http://www.ruaf.org>

ETC-International

<http://www.etc-international.org/>

IDRC

<http://www.idrc.ca>

CIRAD

<http://www.cirad.fr>

IWMI

<http://www.iwmi.cgiar.org/>

CGIAR

<http://www.cgiar.org/>

CIP

<http://www.cipotato.org>

Urban Harvest

<http://www.cipotato.org/urbanharvest/home.htm>

Selected mile stones on UPA worldwide

FAO - Committee on Agriculture, Fifteenth Session. Urban and peri-urban agriculture, 25 - 29 January 1999
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World Food Summit: five years later (FAO, Rome June 2002) . Feeding an increasingly urban world
<http://www.fao.org/worldfoodsummit/english/newsroom/focus/focus2.htm>

World Urban Forum

<http://www.un-habitat.org/categories.asp?catid=535>

Third Meeting of the Support Group of Urban Agriculture (SGUA)

March 18 - 19, 1996 at the International Development Research Centre, Ottawa, Canada

http://www.crdi.ca/en/ev-2442-201-1-DO_TOPIC.html

The Quito declaration

<http://www.idrc.ca/uploads/user-S/10401380100Declaration-Ingles.pdf>

The La Paz Declaration

<http://www.fao.org/sv/noticias/noticias.php>

High Level Conference on Food Security, Climate change and energy (FAO, Rome 3-5 June 2007)

<http://www.fao.org/foodclimate/hlc-home/en/>