



GROWING

GREENER

CITIES



The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations (FAO) concerning the legal or development status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by FAO in preference to others of a similar nature that are not mentioned.

All rights reserved. FAO encourages the reproduction and dissemination of material in this information product. Non-commercial uses will be authorized free of charge, upon request. Reproduction for resale or other commercial purposes, including educational purposes, may incur fees. Applications for permission to reproduce or disseminate FAO copyright materials, and all queries concerning rights and licences, should be addressed by e-mail to copyright@fao.org or to the Chief, Publishing Policy and Support Branch, Office of Knowledge Exchange, Research and Extension, FAO, Viale delle Terme di Caracalla, 00153 Rome, Italy.



Cities of despair – or opportunity?

Challenge: to steer urbanization from its current, unsustainable path and towards greener cities that offer choice, opportunity and hope

These pages are illustrated with designs from the Kigali Conceptual Master Plan, a long-term framework for sustainable development of Rwanda's capital. The plan envisions a city set amid greenbelts and zones reserved for urban agriculture, and open spaces with community gardens.

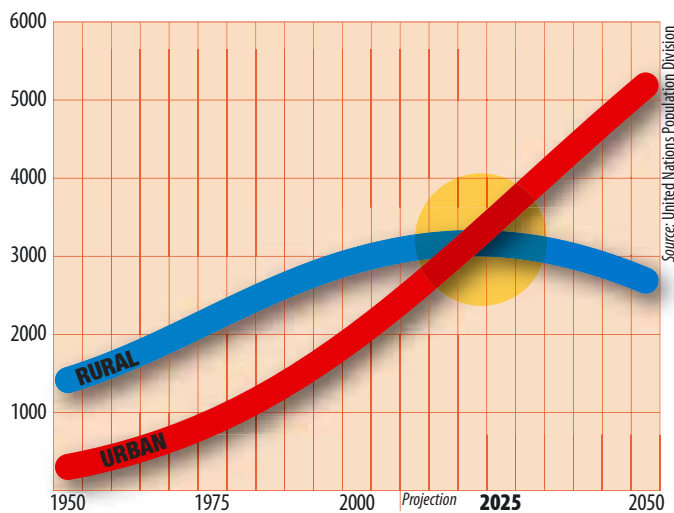
Towns and cities in the world's developing countries are growing on an unprecedented scale. Ten years ago, an estimated 40 percent of the developing world's population – or 2 billion people – lived in urban areas. Since then, their numbers have expanded almost twice as fast as total population growth, to more than 2.5 billion. That is the equivalent to almost five new cities the size of Beijing, every 12 months. By 2025, more than half the developing world's population – 3.5 billion people – will be urban.

While urbanization in Europe and North America took centuries, spurred on by industrialization and steady increases in per capita income, in the developing world it will occur in the space of two or three generations. In many developing countries, urban growth is being driven not by economic opportunity but by high birth rates and a mass influx of rural people seeking to escape hunger, poverty and insecurity.

Most of the world's fastest growing cities are found in low-income countries of Asia and Africa with young populations. Over the next 10 years, the current number of urban dwellers in sub-Saharan Africa is expected to grow by almost 45 percent, from 320 million to 460 million. Kinshasa, capital of one of the world's poorest countries, is now the world's fastest growing future megacity. By 2025, the urban population of least-developed countries in Asia will have grown from 90 million to a projected

Figure 1. Population growth in the developing world, 1950-2050 (millions)

By 2025, more than half the developing world's population will be urban



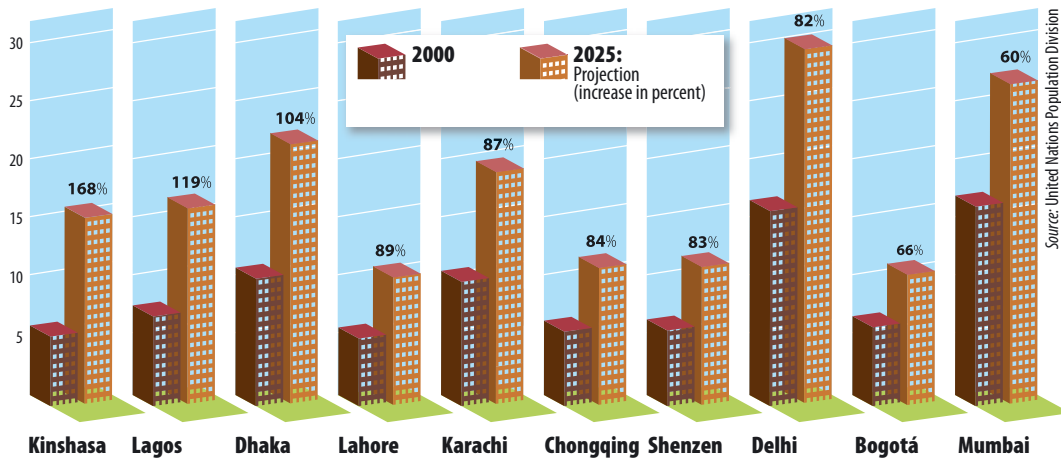


150 million, and Dhaka is expected to be the world’s fifth largest city, with 21 million inhabitants.

Urbanization in low-income countries is accompanied by high levels of poverty, unemployment and food insecurity. Worldwide, an estimated one billion people live in crowded slums, without access to basic health, water and sanitation services. Around 30 percent of the developing world’s urban population – 770 million people – are unemployed or “working poor”, with incomes below official poverty lines.

Those urban poor spend most of their income just to feed themselves. Yet

Figure 2. Population growth in selected cities, 2000-2025 (millions)
Megacities of the future are growing fastest in Africa and Asia



their children suffer levels of malnutrition that are often as high as those found in rural areas. To survive, millions of slum dwellers have resorted to growing their own food on every piece of available land: in backyards, along rivers, roads and railways, and under power lines.

The growth of urban slums outpaces urban growth by a wide margin. By 2020, the proportion of the urban population living in poverty could reach 45 percent, or 1.4 billion people. By then,

85 percent of poor people in Latin

America, and almost half of those in Africa and Asia, will be concentrated in towns and cities.

That prospect has been described as “the new population bomb” and a nightmare for governance: sprawling, degraded and impoverished cities with large, vulnerable populations that are socially excluded, young and unemployed.



The promise of greener cities

Urban development that provides food security, decent work and income, a clean environment and good governance for all citizens

A brighter future for the world's developing cities is both imperative and possible. Historically, cities have been places not of misery and despair but of opportunity – for economies of scale, employment and improved living standards, especially for rural people seeking a better life. They have served as engines of social progress and national economic development.

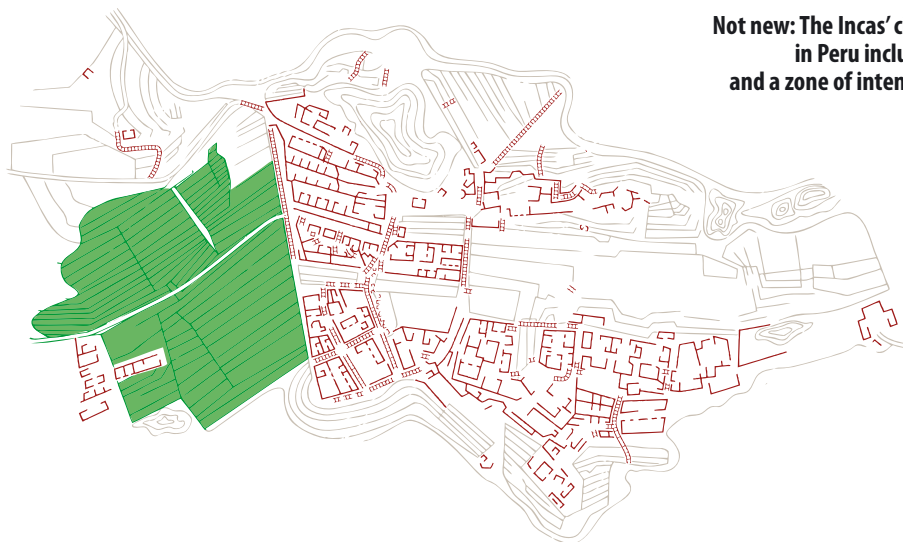
Creating the conditions to realize that potential – in Kinshasa, Dhaka and other growing towns and cities across the developing world – is crucial *now* and will be more so in the decades ahead. The challenge is to steer urbanization from its current, unsustainable path, towards sustainable, *greener* cities that offer their inhabitants choice, opportunity and hope.

The concept of “green cities” – designed for resilience, self-reliance, and social, economic and environmental sustainability –

is usually associated with urban planning in more developed countries. It suggests high-tech eco-architecture, bicycle greenways and zero-waste, “closed loop” industries.

However, it has a special application, and significantly different social and economic dimensions, in low-income developing countries. There, the core principles of greener cities can guide urban development that fosters food security, decent work and income, a clean environment and good governance for all citizens.

A starting point for *growing greener cities* is to recognize and integrate into urban policy and planning many of the creative solutions that the urban poor themselves have developed to strengthen their communities and improve their lives. One of those solutions – and an essential feature of green city planning in developed, and a growing number of developing, countries – is urban and peri-urban horticulture.



Not new: The Incas' citadel of Machu Picchu in Peru included a residential area and a zone of intensively farmed terraces



How horticulture helps grow greener cities

Urban and peri-urban horticulture (or UPH) is the cultivation of a wide range of crops – including fruit, vegetables, roots, tubers and ornamental plants – within cities and towns and in their surrounding areas.

It is estimated that 130 million urban residents in Africa and 230 million in Latin America engage in agriculture, mainly horticulture, to provide food for their families or to earn income from sales.

While the urban poor, particularly those arriving from rural areas, have long practised horticulture as a livelihood and survival strategy, in many countries the sector is still largely informal, usually precarious and sometimes illegal.

But that is changing rapidly.

Over the past decade, governments in 20 countries have sought FAO's assistance in removing barriers and providing incentives, inputs and training to low-income "city farmers", from the burgeoning metropolises of West and Central Africa to the low-income barrios of Managua, Caracas and Bogotá.

Through multidisciplinary projects, FAO has helped governments and city administrations to optimize policies,*

institutional frameworks and support services for UPH, and to improve horticultural production systems. It has promoted irrigated commercial market gardening on urban peripheries, simple hydroponic micro-gardens in slum areas, and green rooftops in densely populated city centres.

The FAO programme, and similar initiatives by partner organizations, have demonstrated how horticulture helps empower the urban poor, and contributes to their food security and nutrition. But it can also help grow greener cities that are better able to cope with social and environmental challenges, from slum improvement and management of urban wastes to job creation and community development.

* FAO-assisted projects for UPH development have been funded by Belgium, Canada, Colombia, France, Italy, Norway, Spain and Venezuela



Food and nutrition security

Growing fruit and vegetables in and around cities increases the supply of fresh, nutritious produce and improves the urban poor's economic access to food

People have food security when they are able to grow enough food, or buy enough food, to meet their daily needs for an active, healthy life. In many of the 21st century's developing cities, all of those conditions of food security are threatened.

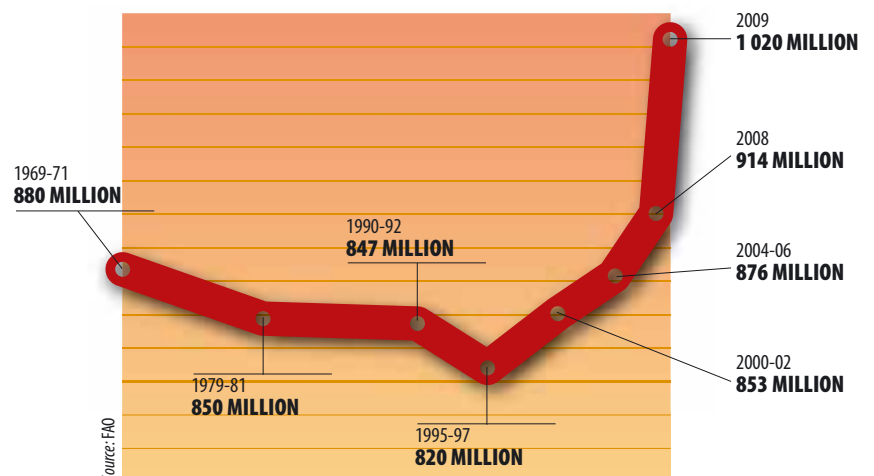
Poor urban households spend up to 80 percent of their income on food. That makes them highly vulnerable when food prices rise or their incomes fall. FAO estimates that in the wake of global food price inflation in 2007/2008, and the subsequent economic recession, the number of chronically hungry in the world has risen by at least 100 million to more than one billion people. The greatest increase has been among the urban poor, women and children.

Access to *nutritious* food is a key dimension of food security. In Africa and Asia, urban households spend up to 50 percent of their food budgets on cheap "convenience" foods often deficient in the vitamins and minerals essential for health. One study found that vitamin A deficiency, a cause of blindness, was more severe among Dhaka slum dwellers than among even the rural poor.

Fruit and vegetables are the richest natural sources of micronutrients. But in developing countries, daily fruit and vegetable consumption is just 20-50 percent of FAO/World Health Organization (WHO) recommendations. Urban meals rich in low-cost fats and sugars are also responsible for rising levels of obesity and overweight. In India, diet-related chronic diseases, such as diabetes, are a growing health problem, and mainly in urban areas.

Figure 3. Number of undernourished, 1969-71 to 2009

The greatest increase has been among the urban poor, women and children





Urban and peri-urban horticulture helps developing cities meet all those challenges. First, it boosts the physical supply of fresh, nutritious produce, available year round. Second, it improves the urban poor's *economic* access to food when their household production of fruit and vegetables reduces their food bills, and when growers earn a living from sales (see *Sustainable livelihoods*, page 8).

Urban food security. Intensive horticulture production on urban peripheries makes sense. But as cities grow, valuable agricultural land is lost to housing, industry and infrastructure (Accra eats up an

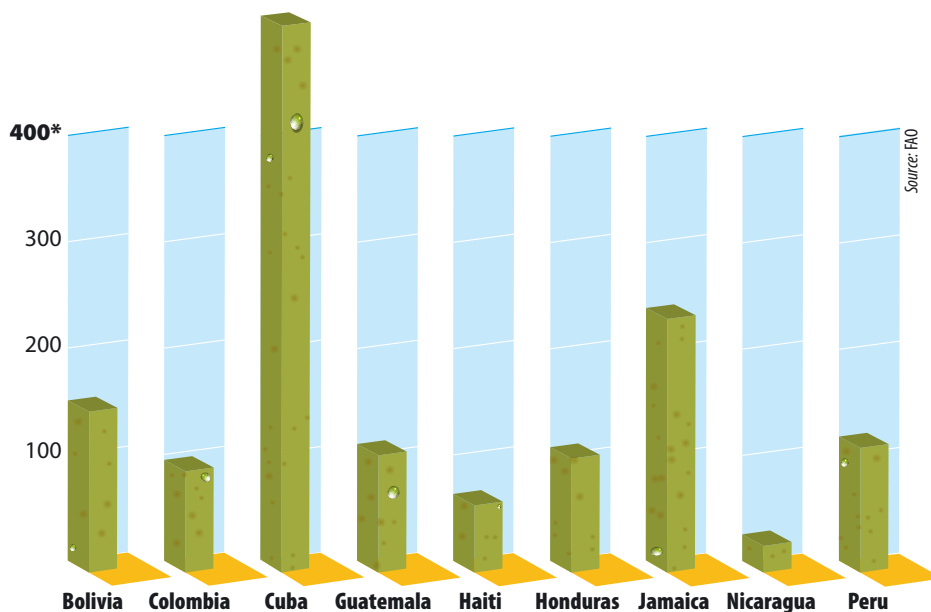
estimated 2 600 hectares of farm land every year). Result: production of fresh food is being pushed further into rural areas. The cost of transport, packing and refrigeration, the poor state of rural roads, and heavy losses in transit add to the scarcity and cost of fruit and vegetables in urban markets.

That is why China has integrated food production into urban development since the 1960s. Today, more than half of Beijing's vegetable supply comes from the city's own market gardens, and it costs less than produce trucked from more distant areas. Horticulture in and around Hanoi produces more than 150 000 tonnes of fruit and vegetables a year. In Cuba, which has promoted intensive UPH since the early 1990s, the sector accounts for 60 percent of horticultural production – and Cubans' per capita intake of fruit and vegetables exceeds the FAO/WHO recommended minimum.

As urbanization accelerates in sub-Saharan Africa, many countries are seeking to develop their commercial horticulture sectors to ensure urban food security. Often the first step is to legalize and protect long established small-scale market gardens that have sprung up without planning or permits.

In the Democratic Republic of the Congo, FAO advised on measures that regularized titles to 1 600 ha of garden areas operated by some 20 000 full-time growers in five cities. The project introduced improved vegetable varieties and installed or upgraded 40 irrigation structures, which extended water availability throughout the year.

Figure 4. Daily fruit and vegetable consumption in selected countries of Latin America and the Caribbean, 2005 (grams/capita/day)
Guess which country has promoted intensive urban horticulture since the early 1990s



* FAO/WHO recommended minimum



In Bolivia, FAO helped train slum dwellers to grow fruit and vegetables in low-cost greenhouses

To ensure the quality and safety of produce, 450 growers' associations were trained in good agricultural practices, including the use of organic fertilizer and bio-pesticides. Market gardens in the capital, Kinshasa, now produce an estimated 75 000 to 85 000 tonnes of vegetables a year, or 65 percent of the city's supply.

Household food security. FAO's programme for UPH also promotes home, school and community gardens, where the urban poor grow their own fruit and vegetables and earn income from the sale of surpluses. In the Plurinational State of Bolivia, FAO helped to introduce community greenhouses and micro-gardens in the municipality of El Alto, where 70 percent of residents live in poverty and 40 percent of children under five are malnourished.

Some 1 500 families were trained to grow a wide variety of vegetables, herbs, medicinal plants and fruits in small, low-cost greenhouses. The result was a general improvement in child nutrition and family savings (averaging \$US30 a month), which were spent on eggs and meat. Similar benefits were reported in Caracas after the

government installed 4 000 micro-gardens in the city's poor *barrios*. In Ecuador, vegetable micro-gardens at 54 child development centres feed 2 500 children and earn enough from sales to be self-supporting.

FAO helped women in poor neighbourhoods of Dakar to start micro-gardens in their backyards and on patios and rooftops. Per square metre, the gardens produce each year up to 30 kg of tomatoes, lettuce and beans, which has led to a doubling of vegetable consumption among participating families.

School gardens are a proven means of promoting child nutrition. They familiarize children with horticulture, provide fresh fruit and vegetables for healthy school meals, help teachers develop nutrition courses and, when replicated at home, improve family nutrition as well. Over the past 10 years, FAO has provided tools, seeds and training to establish thousands of school gardens in more than 30 countries.



Sustainable livelihoods

Urban and peri-urban horticulture provides livelihoods that are resilient to economic downturns and food price hikes, and contribute to cities' economic development

The International Labour Organization estimates that 180 million of the developing world's urban population are jobless and another 550 million earn just enough to survive in the informal economy. Over the next 10 years, almost 500 million people, many of them from rural areas, will enter the jobs market. Unless developing countries create more decent, productive work opportunities, the number of unemployed and working poor could reach 45 percent

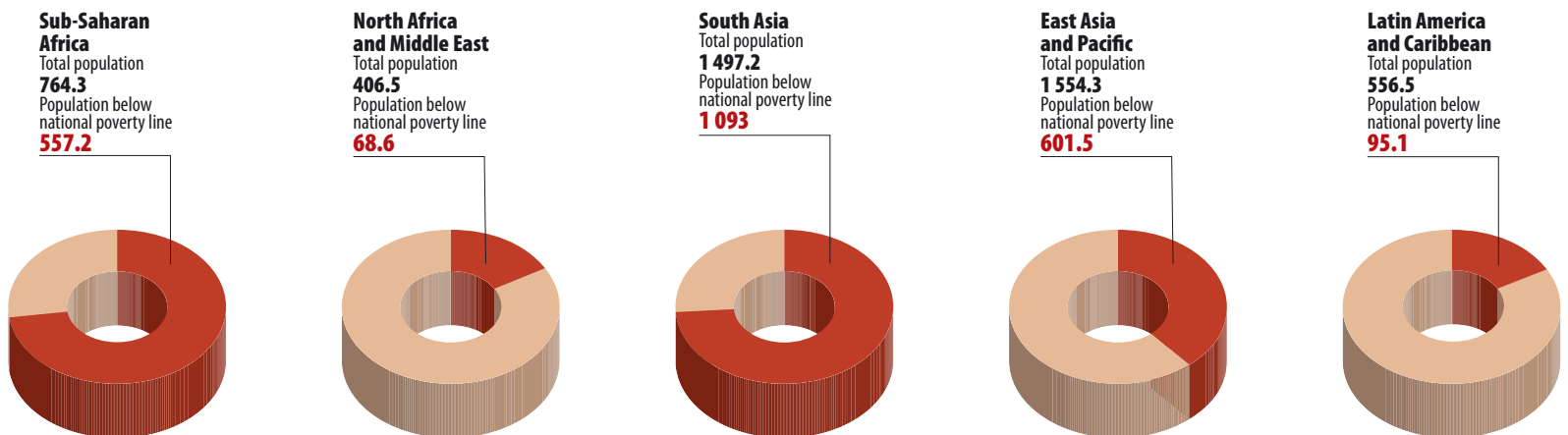
of their urban populations by 2020.

Urban and peri-urban horticulture offers a pathway out of poverty. It has low start-up costs, short production cycles, and high yields per unit of time and unit of land and water. Its produce has high market value. Because it is very labour intensive, horticulture creates employment for the jobless, particularly people newly arrived from rural areas.

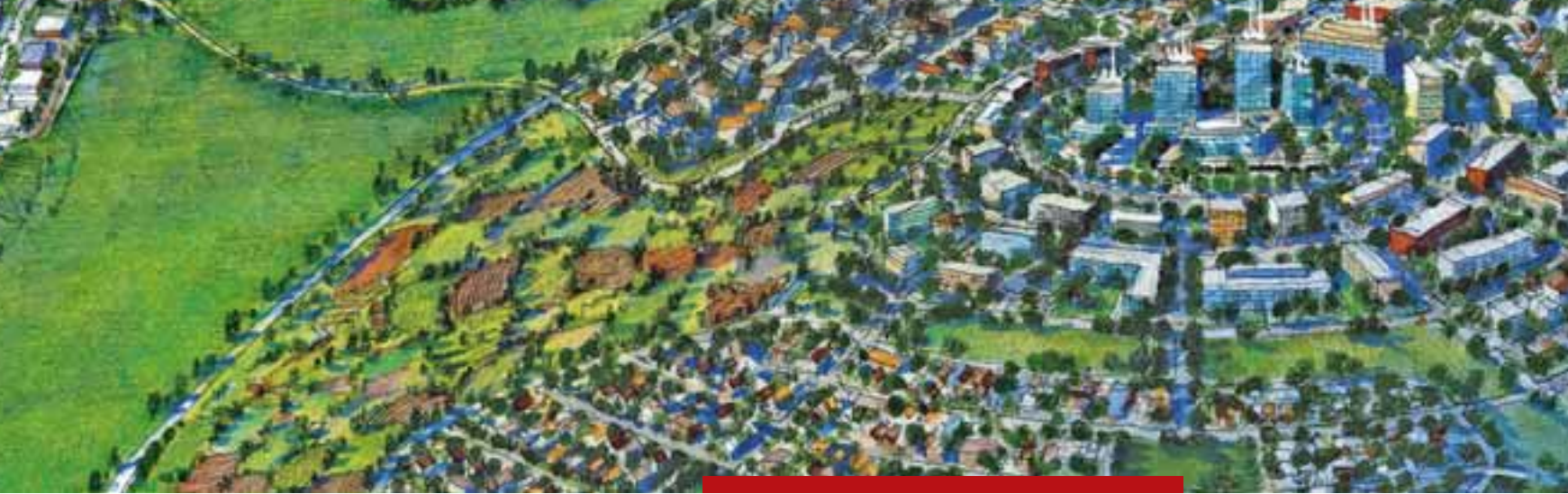
Of the estimated 800 million people engaged worldwide in urban and peri-urban

Figure 5. Population with incomes below national poverty line, 2005 (millions)

By 2020, the proportion of the urban population living in poverty could reach 45 percent



Source: World Bank



agriculture, 200 million produce for the market and employ another 150 million people full-time. The sector provides directly an estimated 117 000 jobs in Havana and income for 150 000 low-income families, or 24 percent of all households, in Hanoi. FAO calculates that the UPH programme in the Democratic Republic of the Congo has created about 40 jobs for every hectare cultivated, or 66 000 jobs, benefiting indirectly some 330 000 people.

Gardening can be profitable even on a very small scale. In Dakar, women kept 30 percent of the vegetables grown in their micro-gardens for home consumption, and sold surpluses through family kiosks, earning the equivalent of a labourer's wages. In the slum areas of Lima, women practise UPH part-time to earn extra income, and still have time for household tasks and child care.

FAO encourages the use of micro-credit to help growers expand production and start new enterprises. In Lubumbashi, in the Democratic Republic of the Congo, 6 000 female gardeners used loans to buy inputs and equipment. As their incomes grew, they invested savings in small-scale livestock, vegetable processing and dress-making. The children of Lubumbashi market gardeners now eat on average three meals a day, compared to "less than two" before the project began.

Because the horticulture commodity chain is long and complex, it generates employment in production, input supply, marketing and value-addition from producer

The horticulture commodity chain generates employment in production, input supply, marketing and value-addition from producer to consumer

to consumer. About 10 percent of Hanoi's skilled labour force is directly engaged in agriculture, while thousands of labourers find work in production of inputs (for example, in seedling nurseries), and food processing and distribution. In Argentina, Brazil and Uruguay, UPH has created jobs in a variety of marketing systems, including community and farmers' markets and door-to-door delivery of food baskets.

UPH can play an important role in strategies for Local Economic Development (LED). On urban peripheries and in other areas with land suitable for crop production, horticulture provides a focus for LED programmes, which build on the comparative advantages of local areas to promote economic growth, employment and poverty reduction.



Safe, clean environment

Linking waste management to horticulture helps to keep the urban environment clean, reduce health hazards and boost production of fresh food

Pollution in rapidly expanding cities poses a serious threat to public health. Lacking adequate sewerage systems and treatment plants, many cities discharge daily huge volumes of raw human wastes and industrial effluent into the environment. In slums, diarrhoea caused by

contaminated drinking water is a major cause of child deaths.

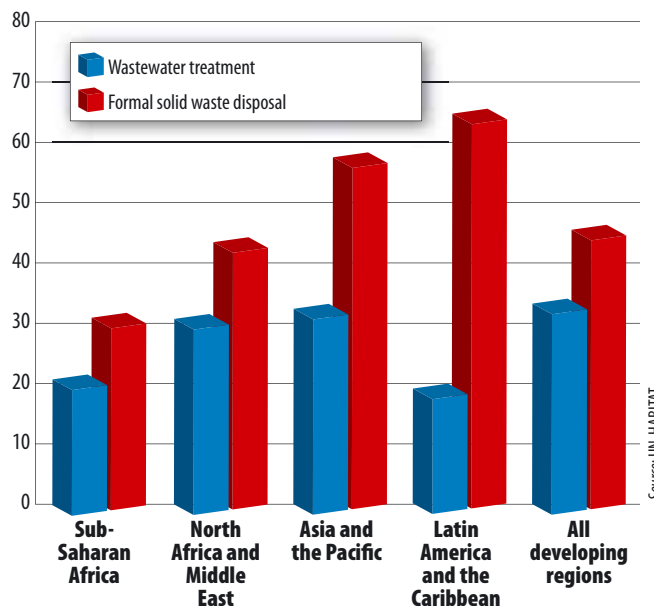
Garbage is left to rot in the streets or dumped unsorted into landfills, adding to ground water contamination. Industry and traffic produce air pollution, responsible in Jakarta for a third of all respiratory illnesses. The urban poor face other environmental hazards: settlements built on marginal land are vulnerable to landslides and flash floods.

Urban and peri-urban horticulture can turn waste into a productive resource. In North America, cities routinely recycle organic waste and offer it to citizens as compost for home gardens. In Addis Ababa, a private company collects each day some 3.5 tonnes of organic waste and converts it into almost two tonnes of high-quality fertilizer. Cuba's national programme for UPH prohibits chemical fertilizer in cities and encourages instead organic composting.

Using wastewater for horticulture is more problematic: pathogens on vegetables grown with untreated wastewater can cause gastrointestinal ailments and even cholera. But, when appropriately treated for agricultural re-use, wastewater from domestic sources can supply most of the

Figure 6. Urban waste management, by region (percent)

Only one third of wastewater is treated in the world's developing cities





In Cairo, rooftops planted with vegetables are 7° C cooler than those next door

nutrients needed to grow fruit trees, vegetables and ornamental plants.

To reduce the risk of contamination, FAO helps train vegetable growers in the safe handling of wastewater and selection of suitable crops. In Gaza and the West Bank, it introduced low-cost treatment units that allowed residents to irrigate gardens and orchards with the greywater discharged from kitchens and showers.

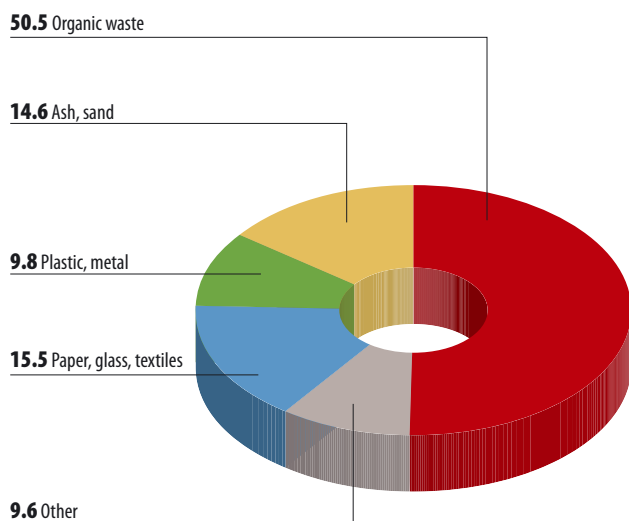
As competition for urban water intensifies, wastewater recycling for horticulture needs to be incorporated in urban planning. One promising option for developing cities is shallow stabilization ponds that use algae

and bacteria to eliminate pathogens while retaining nutrients.

UPH has other environmental benefits. It reduces the need to transport produce into cities from distant rural areas, generating fuel savings, fewer carbon dioxide emissions and less air pollution. It lowers city temperatures – in Cairo, rooftops planted with vegetables are 7° C cooler than those next door – and, when practised on greenbelts, improves landscapes and citizens’ quality of life. On Peru’s arid coast, horticulture has helped to “green” many municipalities.

Greenbelts also stabilize environmentally fragile land, such as hillsides and river banks, and protect them from being used for unsafe residential development. In Bogotá, Hanoi and Sao Paulo in Brazil, city gardens help maintain good soil structure and porosity, which improves aquifer recharging and reduces runoff, thus preventing landslides and flooding.

Figure 7. Solid waste produced by the city of Thiruvananthapuram, India (percent)
Plenty of raw material. Organic waste can be converted into high quality bio-compost



Source: Nair and Sridhar, *Cleaning up Kerala*, Danish Books, Delhi (2005)



Good governance

Building a sustainable UPH sector provides a laboratory for innovative approaches to urban development, and examples of good governance in action

The United Nations Human Settlements Programme says the “unmanageability” of urban areas is due more to failures of governance and urban planning than city size. It calls for action to strengthen the capacity of local government to plan for future growth, and for integrated governance that improves coordination among public services at all levels.

In many countries, UPH goes unrecognized in agricultural policies and urban planning. Growers often operate without permits from municipal authorities, or on land granted under customary law. Since it is officially “invisible”, the sector receives no public assistance or oversight. Growers with insecure title to their plots and limited or no access to inputs and extension services have little incentive to invest in increased production.

FAO’s approach to urban and peri-urban horticulture underscores the need to transform UPH into a fully acknowledged commercial and professional activity, integrated into national agricultural development strategies, food and nutrition programmes, and urban planning.

In Latin America, Argentina, Brazil and Cuba have adopted national plans and policies to actively promote UPH. Brazil’s Ministry for Social Development and Combating Hunger sets urban agriculture guidelines. In Egypt, FAO helped the government launch a “Green food from green roofs” programme that encouraged Cairo residents to grow their own vegetables in beds of rice husks, sand and peat moss.

Figure 8. Kigali Conceptual Master Plan (detail)

In Rwanda, the city of Kigali has sought FAO advice on measures aimed at integrating UPH into the city’s master development plan





Brazil's Ministry for Social Development and Combating Hunger sets urban agriculture guidelines

The Democratic Republic of the Congo has created an effective institutional structure for national UPH development. Municipal committees chaired by city mayors manage the process of regularizing titles to land for horticulture and integrating UPH into urban planning, while the country's national UPH support service provides technical advice to growers through a network of offices in 11 provincial capitals.

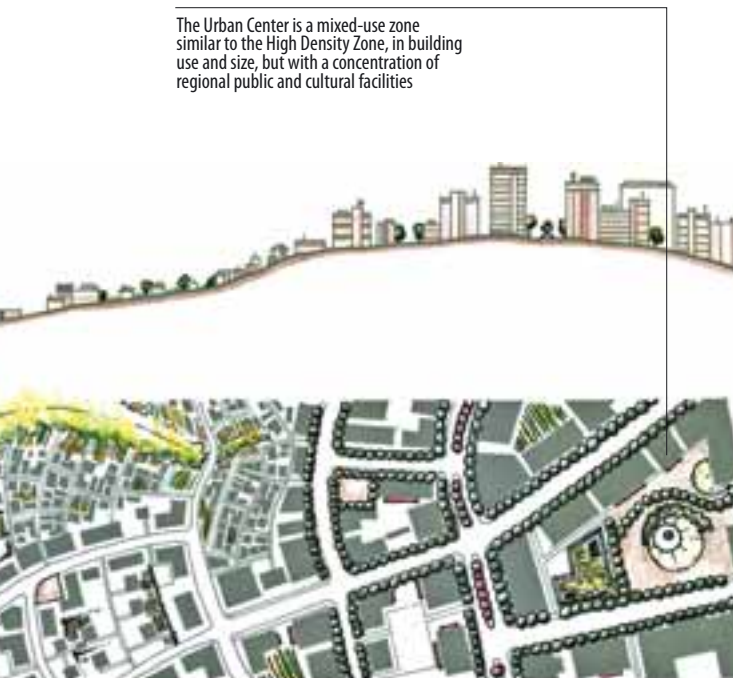
Formal, government-recognized programmes for urban agriculture now also exist in most cities of South Africa. The municipality of Cape Town supplies community gardening groups with “start-up kits” – tools, seeds and compost – and access to skills training. Nairobi and Accra have both created municipal agricultural

departments. In Hanoi, a range of public services, including 100 plant protection and extension staff, support the city's thriving urban agriculture sector.

UPH development fosters closer collaboration among government and municipal departments. In Windhoek, FAO worked with the ministries for youth, local government and gender equality on a project for young unemployed. In Kampala, specialists in health, agriculture and town planning worked together in framing new ordinances that removed old barriers to “city farming”.

As part of Bolivia's national poverty reduction strategy, the municipality of El Alto, near La Paz, launched a “green plan” which assigned 3 700 ha for parks, gardens and horticulture, and created a UPH unit within the municipality's environment department. In Rwanda, the city of Kigali has sought FAO advice on measures aimed at integrating UPH into the city's master development plan.

The Urban Center is a mixed-use zone similar to the High Density Zone, in building use and size, but with a concentration of regional public and cultural facilities





Healthy communities

Orchards and vegetable gardens provide excluded groups with food, income, a focus for shared enterprise and a constructive channel for young people's energy

Hunger, poverty, exploitation and lack of hope can lead to high rates of crime, prostitution, child neglect and drug abuse in developing cities. The young are particularly vulnerable. In the developing world as a whole, almost half the population is under 25 years old; in sub-Saharan Africa, 43 percent is under 15. As high birth rates and rural migration add millions to the youth population over the coming decade, urban frustration could reach boiling point.

By providing food, income and a focus for shared enterprise, urban and peri-urban horticulture helps build happier, healthier communities. It integrates excluded and

vulnerable groups into the urban social fabric, and offers a constructive channel for young people's energy.

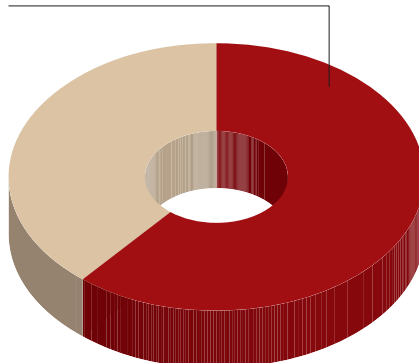
In Colombia, for example, the "Bogotá without indifference" community gardening programme extends the benefits of vegetable gardening to former combatants, the elderly, female prison inmates, the disabled and people affected by HIV/AIDS.

In the Nairobi slum of Mathare, young men with a past as petty thieves now earn a decent living growing and selling vegetables to their community. Income helps pay for fees to attend night school. Community gardens in Buenos Aires are described as "symbols of vitality and growth" in

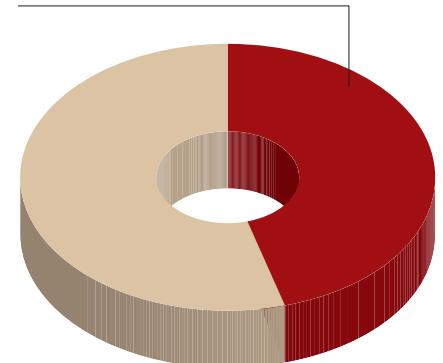
Figure 9. World population age structure, 2007
(millions)

In the developing world, almost half the population is aged under 25 years

Africa
Under 25 years
590.8



Asia
Under 25 years
1 837.8





neighbourhoods long known for crime and poverty.

Evidence from cities around the world underscores the positive impact of urban and peri-urban horticulture on women, youth and children. Among the benefits cited by participants in a community micro-gardens project in Senegal was social networking among previously isolated housewives.

In outlying areas of Mexico City, women employed as domestic servants in the city centre were leaving home at 4 a.m. and returning at night. During their absence many of their children frequented street gangs. By switching to horticulture, they not only found a new source of livelihood, but were able to dedicate more time to child care.

In Port Elizabeth, South Africa, where an entire generation of parents has been lost to AIDS, an NGO has started school gardens and backyard plots for orphan-headed households, linked to a health clinic. Grandmothers have formed a tightly knit social circle that provides care and support,

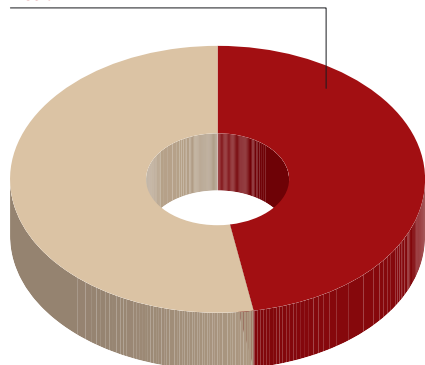
Young men with a past as petty thieves now earn a decent living growing and selling vegetables to their community

and school attendance has increased by 25 percent.

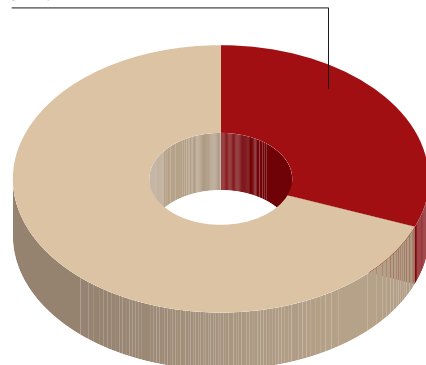
In Namibia's dusty Katatura township, FAO helped a gardening group, called "Hope", to establish a horticulture training centre for others in their community.

FAO says urban and peri-urban horticulture should have an important place in slum upgrading schemes and the design of new neighbourhoods for the urban poor. As well as income and food, orchards and vegetable gardens offer a healthy urban living environment, a connection to the rural and the natural – and the pleasure derived from hands in soil and watering green plants round sunset.

Latin America and Caribbean
Under 25 years
269.7



North America, Europe, Oceania
Under 25 years
344.2



Source: United Nations Statistics Division

FAO's Programme for Urban and Peri-urban Horticulture (UPH)

To help developing countries meet the challenges of massive and rapid urbanization, FAO launched in 2001 a multidisciplinary initiative, Food for the Cities, which aims at ensuring the access of urban populations to safe food and to healthy and secure environments. FAO's Programme for Urban and Peri-urban Horticulture is a key component of the Food for the Cities initiative. It helps governments and city administrations to optimize policies, institutional frameworks and support services for UPH, to improve production and marketing systems, and to enhance the horticulture value chain.

Contact:

Programme for Urban and Peri-urban Horticulture
Plant Production and Protection Division (AGP)
Food and Agriculture Organization of the United Nations
Viale delle Terme di Caracalla
00153 Rome, Italy

email: greenercities@fao.org

web: www.fao.org/ag/agp/greenercities/



Produced with a contribution from the Belgian Development Cooperation. Belgium is a primary partner of FAO's Programme for Urban and Peri-urban Horticulture. It has provided funding for FAO projects in the Plurinational State of Bolivia, Burundi, the Democratic Republic of the Congo, Côte d'Ivoire and Namibia and for an ongoing global initiative aimed at disseminating lessons learned.

*Illustrations from the Kigali Conceptual Master Plan provided by OZ Architecture – www.ozarch.com
Text/Design: Graeme Thomas and Giulio Sansonetti • Cover by Giancarlo de Pol*



**GROWING
GREENER
CITIES**

FAO's Programme for Urban
and Peri-urban Horticulture

*How urban and peri-urban
horticulture contributes to:*

*✿ food and nutrition security
✿ sustainable livelihoods ✿ safe,
clean environment ✿ good
governance ✿ healthy communities*



Food and Agriculture Organization
of the United Nations (FAO)
Viale delle Terme di Caracalla
00153 Rome, Italy
www.fao.org