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The many government, institutional and agency interventions in urban agriculture documented here are but a fraction of the global activity in this area. This volume does not even consider the organization of urban agriculture in North America and Europe, even though urban agriculture is particularly well organized, especially in Europe.

Lamentably, there has been little collaboration to date among organizations active in the field. Our hope is that in the not-too-distant future, there will be strong, mutually beneficial links between urban farmers in the south and those in the north, and that all concerned institutions can help bring about a new day of cooperation and sharing. The possibilities for such interactions are explored in chapter 10.

Notes

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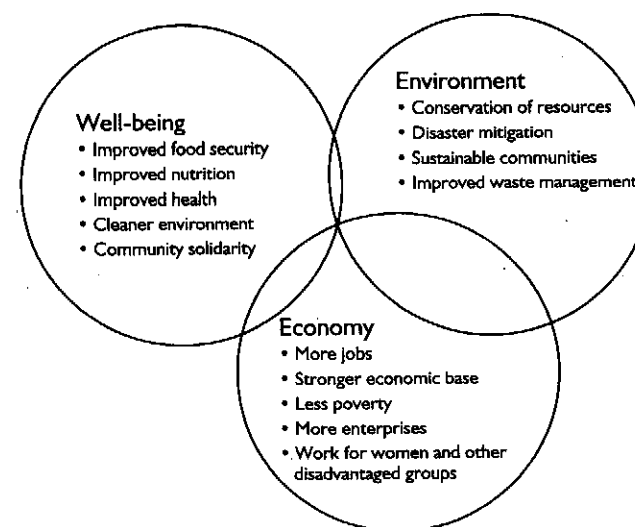
Benefits, problems and constraints

The benefits of urban agriculture

Urban agriculture provides benefits to the economy, the environment and the well-being of both those active in the industry and to residents of the town or city (figure 7.1). It has a role to play in programmes and projects that target health and nutrition, the environment, enterprise development, income generation, water and sanitation, youth and women and food production and supply.

The current and potential role of urban agriculture differs from country to country and depends on the particular country's circumstances. In countries that must export agricultural products to earn foreign exchange, urban agriculture can feed the cities while rural

Figure 7.1 Main contributions of urban agriculture



farmers concentrate on exports. In countries with a fragile ecology, urban agriculture's intensive production technology and its capacity to absorb urban wastes may be essential to averting environmental disasters around urban regions.

Health, nutrition and food security

Factors that influence the health and well-being of individuals include the quantity, quality, regularity and nutritional balance of their food intake, as well as the quality of their living environment. Urban agriculture contributes to the health and well-being of a community by reducing hunger, improving nutrition and improving environmental conditions that affect health (table 7.1).

The World Bank and others have developed "healthy days of life" and other quality-of-life indicators to measure a society's health and well-being. Studies indicate that 40–75% of adults and children living in low-income urban areas in poorer cities have diseases that limit their capacity to learn and work.¹ By reducing hunger and malnutrition, urban farming makes the urban poor healthier, more productive and more resistant to diseases. In addition, farming activity cleans and greens the living environment, reducing pollution and disease-causing pathogens and vectors in the environment. Household waste and refuse can be recycled for agricultural uses, providing additional environmental benefits.

The benefits offered by urban agriculture are both quantitative and qualitative: enhancing the quantity of food available reduces hunger, while improving the quality of food fosters better health and nutrition. Nutritionists have determined that the dietary intake of preschool children is an important factor for healthy mental and physical development. Hunger and nutritional deficiencies can lower productivity, reduce health and shorten life. Hunger can occur as a result of poverty or as a result of inadequate food supply and a distribution system that both increases the cost of, and reduces the physical availability of, food. In some social groups, women and female infants may be given less food than male members of the family, making them particularly prone to hunger and malnutrition.

For the poorest with unstable incomes, daily dietary intake varies depending on that day's income and on prices in the market. They may thus suffer from hunger for part of the year. Urban poor, far

Table 7.1 Examples of the impact of urban agriculture on health, nutrition and food security

Country	Impact
AFRICA	
Kenya	Twenty-five percent of the country's urban population is dependent on self-produced food for nutritional survival.
Uganda	In Kampala, children of low-income farming families are as healthy as children of wealthy families and healthier than children of non-farming low-income families. Save the Children Fund recommended that supplementary feeding programmes in low-income areas of Kampala were not needed and noted that urban food production was a factor in Uganda in the late 1980s.
Zambia	Severe economic crisis led to increased food production in Lusaka. By 1977, 43% of one low-income community was farming home gardens and 57% was farming other city farms—saving 10–15% on food costs. According to a 1994 report, 80% of families farm in some low-income neighbourhoods.
ASIA	
China	In Shanghai, vegetables grown in the metropolitan area reach market within ten to 15 hours of harvest.
Indonesia	In Java, home gardens supply about 18% of caloric consumption and 14% of proteins for residents.
Nepal	In Kathmandu, 37% of households polled in a survey reported that they met plant food needs through household production. In the 1980s the average plant food production consumed directly by households was 72%, and the average animal food was 86%. Forty-one percent of average daily food intake was derived from household production.
Philippines	On the island of Negros, malnutrition among urban and rural children dropped from 40% in 1988 to 25% in 1990 after the start of biointensive gardens. In Cebu City, horticulture combined with public health interventions increased vitamin A levels significantly among children and provided other nutritional benefits that supplementation and fortification interventions alone did not provide.
SOUTH AMERICA	
Argentina	In Buenos Aires, 20% of the nutritional need of the city is produced by part-time farmers. Urban farmers consume 70 kilos of vegetables per person each year, while their non-farming neighbours consume only 30 kilos.

Source: Compiled by The Urban Agriculture Network from various sources.

more than rural poor, are dependent on cash income to purchase food. Moreover, the poor often pay more for food than richer urban residents because they purchase small quantities rather than bulk and pay more in transportation and time to reach cheaper sale points.²

The locus of poverty is fast shifting to urban areas. By 2000, close to 2.5 billion people will be living in cities, more than half of them in poverty.³ Persistent and chronic hunger are increasingly more urban than rural problems. In most low-income cities, expenditures on food take a substantial bite out of household income. The poorest households spend 60–90% of their income on food—and face hunger as a result.

Urban agriculture can contribute significantly to combating urban hunger and malnutrition in the following ways:

- ▼ Self-production and barter increase the food security of the poor by making it possible to obtain food they could not otherwise afford—even during bad financial times. Because daily food intake does not depend on their unstable daily income, poor families gain control over the quantity, quality and stability of their diet.
- ▼ Urban agriculture provides the poor with control over the nutritional balance of the family diet. More expensive food items, like fruit, vegetables and meat, are supplied through home production. The improved nutritional balance reduces protein and energy malnutrition as well as deficiencies of essential micronutrients and vitamins.
- ▼ It provides fresher food. Food from outside the city—especially perishables like fruit, vegetables and fish—loses much of its nutritional value in transit and storage.
- ▼ Local production may bring down food prices due to the savings resulting from fewer middlemen and less transportation and storage. Local production makes food available in the neighbourhood and thus improves physical access.
- ▼ By reducing the cost of food, urban farming makes income available for other expenditures, including health and education.
- ▼ In many countries, urban farmers are more likely to be female than male. Thus urban agriculture helps ensure children's access to food and contributes to empowering women.

Governments and development agencies have used various strategies to address the problems of hunger and malnutrition, including food subsidies; food stamps; school children and mother feeding programmes; and targeted distribution of iron, vitamin A supplements and iodine tablets. Most imply high and continuous costs to the state. As a strategy to combat hunger, promoting farming in poor urban neighbourhoods is more cost-effective and more empowering than providing food aid.

Producing their own food is a food security strategy for millions of urban poor around the world. A majority of urban farmers (70% in Kenya) are low-income agriculturalists, producing for home consumption.⁴ In Jakarta, almost one-fifth of the food consumed by squatters is self-produced; in Lusaka, one-third.

In the city of Shanghai, production and supply of vegetables is managed so that the vegetables reach the market within ten to 15 hours of being harvested (see case 6.2). A striking example of the nutritional impact of urban farming is provided by a study in Kampala, which found that children of low-income farming families were as healthy as children of high-income families and healthier than children of non-farming poor families.⁵

Where farming by the poor has been systematically supported by development agencies, long-term and sustainable benefits are reported, as shown in two Philippine cases. In Negros, malnutrition was reduced in two years from 40% to 25% among families of participants in a programme that promoted biointensive home gardens.⁶ In Cebu City, horticulture, as a public health intervention, provided more significant increases in vitamin A levels among children (as well as other nutritional benefits) than other, more standard supplementation and fortification interventions (for example, targeted supply of iron, vitamin A, iodine tablets).⁷

In Haiti, CARE International has a project to assist the poorest urban residents to grow food for consumption and sale. Also in Haiti, Educational Concerns for Hunger Organization of Florida is assisting poor residents to grow vegetables intensively in shallow beds on rooftops (see case 5.4). In Kenya, the Undugu Society is helping poor families grow vegetables and fruit and raise livestock to improve the nutritional self-reliance of poor communities (see case 6.1). In Lima, Peru, families are experiencing nutritional and other benefits from urban farming (case 7.1).

Home gardens as nutritional solutions have been promoted by several international agencies—including UNICEF, Save the Children, the Mennonite Christian Committee, the American Friends Service Committee and Oxfam—especially to increase the vitamin and micronutrient intake of mothers and growing children. The US Agency for International Development's Vitamin A Field Support Project (VITAL) reports several studies that found a significant increase in vitamin A consumption is related to home gardens.⁸ However, most of these programmes target only the rural poor, in

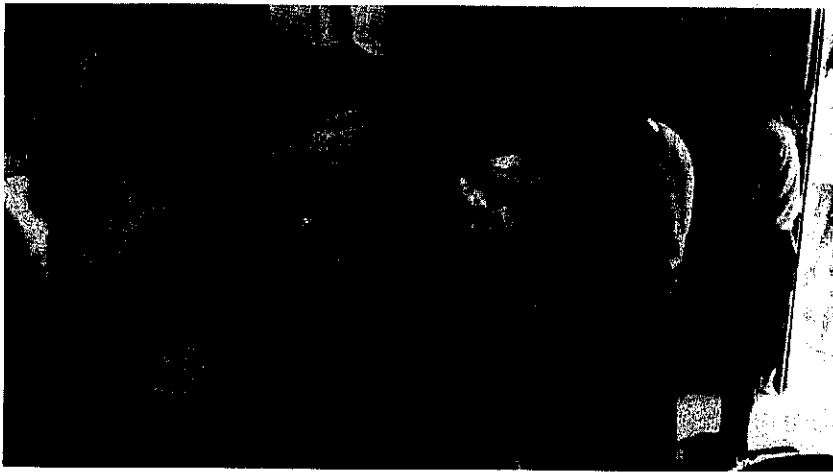


Photo 7.1 Community kitchen in Lima that uses produce grown in community gardens to improve the nutritional quality of meals

many countries leaving out the majority of food-insecure poor—the urban poor.

Case 7.1 Growing food for community kitchens in Lima

Community kitchens (*comedores populares*) in Lima, Peru, run mainly by women, serve cooked food to their members, who are predominantly from poor communities. Traditionally, rice, beans and oil are subsidized by the government and international aid; kitchen members raise small livestock at home for use in the kitchen.

In recent years, CARE International has collaborated with HUFACAM (the division of the Ministry of Agriculture that promotes urban farming) and the Ministry of Health to promote community gardens for the *comedores*, which grow vegetables and fruits to improve the nutritional quality of the food served. These gardens, typically 100 square metres, are on government land—in small parks and at health centres and playgrounds, for example. CARE provides seeds and a technical expert. The government provides a social worker who helps organize the farming activity. In some cases, CARE and the government assist with access to water. The farmers use household and street waste, as well as the manure from their home livestock, to enrich the soil. Facilitating health workers report that the gardens have immense nutritional benefits and help create self-reliance and empowerment within the communities.

Contact: Manuel Orozco Ramos, P.E., HUFACAM, Ministry of Agriculture, Lima; Lucila Alegre de la Cruz, Microenterprise Director, CARE International, Psje. Estados Unidos 131-A, 3er. Piso, Comas, Peru.

The benefits of fresher food from local production are available not just to farmers' families but to the entire city. Too often, market

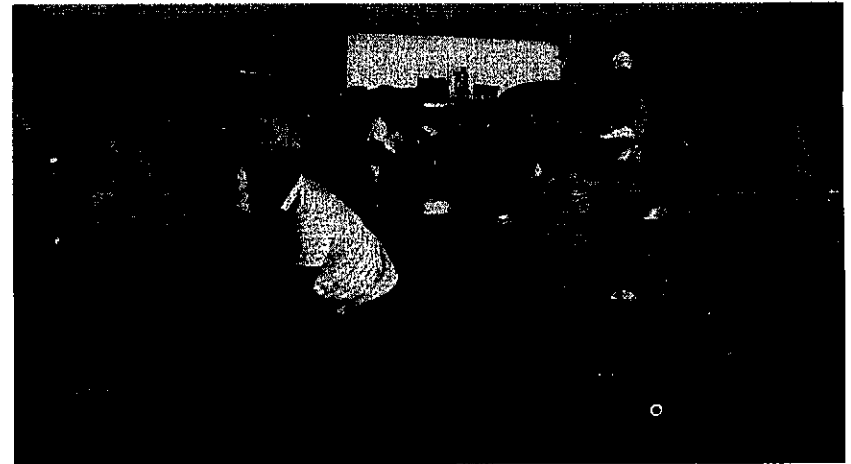


Photo 7.2 Fresh meat being sold at a farmers market in Managua

fruits, vegetables and meats go bad due to long journeys to market and lack of proper storage. Urban agriculture helps make available fresher produce and meat. Middle-income kitchen gardens, a common sight throughout the world, contribute to improving the nutritional status of middle- and higher-income families.

Nutritionists have been surprised that in some cities, even civil war or economic crisis has produced relatively little additional urban hunger. In Kampala, Uganda, in 1981 (after the civil war), UNICEF found that urban agriculture, a virtually undocumented phenomenon, was substantially feeding the city in non-cereal foods.⁹ Similarly, in Kinshasa in 1991, after Zaire's economic collapse, malnutrition was less prevalent than might have been expected.¹⁰ In Baghdad and Sarajevo in the 1990s, residents have turned to gardening to provide for their nutritional needs.

Social benefits

Urban agriculture's benefits for farmers and their families are a springboard for its benefits to society. Urban farming improves social equity by improving the health and productivity of poorer populations and by providing them an opportunity to earn additional income. The health, income, environmental and other benefits of urban agriculture for low-income farmers all make strong positive social contributions.

Urban agriculture helps reduce urban poverty in a number of ways. First, it provides fungible income. Since food is by far the largest component of household expenditures, any saving on food makes a significant portion of income available for non-food purchases. Second, because it is entrepreneurial, it produces profits and jobs. Third, the nutritional and environmental benefits result in more productive individuals, capable of enhancing their own well-being and that of their families. Finally, children, who are most prone to malnutrition, get an increased and improved diet, especially when the farmers are women.

The poor are not one large, shapeless, vulnerable group. Some are more vulnerable than others. Urban agriculture often helps the weakest members of poorer communities disproportionately; this group includes women, migrants, immigrants, refugees and people in long-term civil crises (see chapter 3). The work opportunities provided by urban agriculture generate employment and income for those who have the fewest employment opportunities in urban areas. Urban agriculture is a way for people in these groups, and for day-wage earners and the unemployed, to become entrepreneurial. Women growing hydroponic vegetables in the slums of Bogotá, for example, typically produce incomes that exceed their husbands' salaries (see case 5.5). Youth have learned through urban agriculture projects, such as the Peace Corps project in the Dominican Republic, not only to achieve

stable income but to become accountable for their communities' environmental well-being and food security.¹¹

Urban cultivation is frequently undertaken through community organizations, in other words, by collective entrepreneurs. When successful, such community efforts in urban agriculture are an effective means of empowerment, as the International Food Policy Research Institute found through a home gardening project it studied in Guatemala.¹²

Urban agriculture also contributes to a community's well-being by improving its aesthetics and solidarity. Neighbourhoods that include urban agriculture have a higher level of social interaction and better security, in part because the activity is on the streets rather than behind closed doors. Neighbours tend to share a concern for the success of the enterprise and often the fruits of its labour as well.

Finally, to the benefits already identified must be added a less tangible, less direct one: individual empowerment. Peru Mujer's experience shows the improvements that urban agriculture can bring to women's lives beyond nutrition and income: better self-image, higher standing within the family and elevated social and economic position within their community (case 7.2). This benefit is especially important since a high percentage of urban farmers are women.

Case 7.2 Social benefits of urban farming supported by Peru Mujer in Lima

Peru Mujer, a non-governmental organization (NGO) working with low- and middle-income women in Lima, Peru, and a few up-country towns, administers a comprehensive and well-planned community gardening programme that contributes to improving the food security, nutrition and health of 5,000 families.

On average, the community gardens consist of 40 plots of 60 to 200 square metres. Most are farmed by women, who grow biointensive vegetables mainly for consumption. Peru Mujer provides training and extension as well as marketing and processing support. It also creates organization and leadership structures among the farmers. The NGO has been particularly successful in negotiating access to land and water and arranging for the land to be fenced to protect the gardens from theft and free-grazing cattle. At some sites, watchmen are engaged.

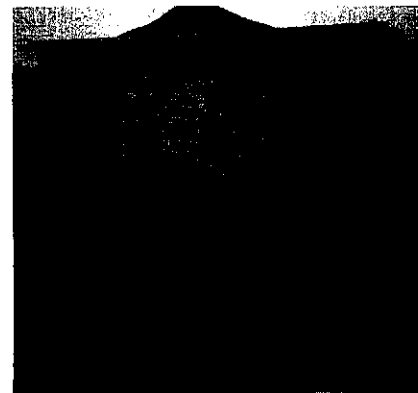


Photo 7.4 Training facility operated by Peru Mujer on hospital grounds in Lima



Photo 7.3 Community gathering in Sagbe, Abidjan, for the smoking of locally caught fish

Peru Mujer develops its own training manuals, covering not only the technical aspects of farming but also nutrition and health issues. It has a good relationship with the government: one training facility is on the grounds of a government hospital, and several community gardens are on public land.

The activities of Peru Mujer are funded by local and international organizations, including Oxfam and the Ford Foundation.

Contact: José A. Dasso, Peru Mujer, Lima, Peru (see appendix F for complete address).

Economic benefits

The economic importance of urban agriculture has received little attention to date. Scholars have tended to regard it as a subset of either rural agriculture or the informal sector, or as a temporary phenomenon. The available data suggest, however, that the economic benefits of urban agriculture are at least as great as the nutritional and environmental benefits.¹³

Urban agriculture strengthens the economies of towns and cities by adding a substantial industry that supplies a basic demand item—food, especially vegetables, poultry, milk, fish, fruit and livestock. The input, production, processing and marketing activities linked to urban farming create considerable economic activity in the city.

Urban farming is a competitive economic activity and the industry of choice of millions of urban entrepreneurs. It also provides income-generating opportunities for people with low skills and little capital, as well as for people with limited mobility, including women with children and aged persons. For many private and public entities—including port authorities, hotels, restaurants, airports, municipalities and electric and water utilities—it provides opportunities for secondary incomes.

Urban agriculture often utilizes unused resources in the city—wastewater, solid waste, vacant lots, bodies of water and rooftops. It puts idle land to productive use, either by paying competitive rent or through usufruct use, and maintains the land in good condition for the owner. For countries with foreign exchange problems, urban agriculture can be an import-substituting industry.

The economic benefits of urban agriculture can be discussed in terms of its role in three areas: (a) employment, income generation and enterprise development; (b) the national agriculture sector and urban food supply and (c) land use economics.

Employment, income generation and enterprise development

It is not surprising that both low- and high-income entrepreneurs choose urban farming as their industry. Because food is the most basic consumption item—the industry with the most stable and dependable demand, even during economic downturn—it reduces the risk of the enterprise. Because they are close to the market, urban farmers can tailor their production to market demand and supply high-value and perishable items. Closeness to the market also gives farmers a competitive advantage through savings in transportation and storage costs.

Whether small or large, legal or illegal, informal or formally recognized, urban farmers around the world are producing competitive incomes through farming (table 7.2). In Jakarta, a group of farmers runs a profitable vegetable farm on land allotted in return for services inside the grounds of a racetrack. Poultry farms holding a few thousand birds are a common sight at the outskirts of many cities.

Urban food production has a significant multiplier effect on the city economy; it generates economic activity in related industries, including those that supply agricultural inputs (such as fertilizer, seeds, feed and extension services), as well as storage, transportation, canning, marketing and food processing industries. Street food vendors in



Photo 7.5 Small-scale ornamental horticulture production and retail at a roadside near Dakar.



Photo 7.6 Large ornamental horticulture enterprise in Bogotá

Table 7.2 Examples of the impact of urban agriculture on job and income generation

Country	Impact
AFRICA	
Tanzania	In Dar es Salaam, urban agriculture was the second-largest employer in 1988, after petty trading and labour. Twenty percent of working-age adults participate in urban agriculture.
Zambia	The average annual income of participants in a programme to expand and improve food gardens in Matete nearly doubled in two years.
ASIA	
India	Intensive farming on 800 hectares of garbage dumps in Calcutta employs about 20,000 people. Fisheries in sewage-fed lagoons employ 4,000 families and produce 6,000 tons of fish every year.
Thailand	In Bangkok, a poultry conglomerate contracts to approximately 10,000 outgrowers.
NORTH AMERICA	
United States	Kona Kai Farms in Berkeley, California, made \$238,000 in 1988 through sale of organic specialty greens grown on a half acre. Three employees are starting their own garden farms.
SOUTH AMERICA	
Argentina	In Buenos Aires, backyard gardens can provide 10–30% of the cost of a nutritious diet.
Colombia	Urban hydroponics supported by UNDP generate approximately US\$30 per month on 10 square metres and require only one hour of daily care. Up to two monthly minimum salaries (US\$90–\$180) can be made on 30–60 square metres of planting.

Source: Compiled by The Urban Agriculture Network from various sources.

Bangkok and elsewhere grow their own food and cook it for sale every morning.¹⁴ In Bamako, Mali, entrepreneurs supply compost excavated from garbage dumps to meet farmers' demand for fertilizer.

Urban farming provides secure jobs to many in the city. In some cities, as many as one-fifth to one-third of all families are engaged in agriculture, with as many as a third of these having no other source of income.¹⁵ Tanzania's 1988 census found that urban agriculture was the second-largest employer in the district of Dar es Salaam, with a population of about two million. (The first source of jobs was "petty trading and labour".) One in five adults of working age in Dar es Salaam is a farmer.¹⁶

But urban agriculture is frequently not recognized in labour statistics or included in economic data collection. Urban farming often goes unreported; individuals may not count their self-employment

in farming as a job, and statistical surveys may ignore the money a family saves by growing food at home.

In greater Bangkok, the Choroe Polphord conglomerate has contracts with no less than 10,000 poultry outgrowers. A great many of the outgrowers are small-scale entrepreneurs who provide employment to others. In Manila, the Urban Food Foundation farmers cooperative includes 500 small-livestock producers. Thousands of such examples exist globally (case 7.3).

The urban farmer has a competitive advantage in specialty crops and specialty markets such as the export market. Food processing and marketing corporations benefit from purchasing from urban farmers; the proximity ensures better contact and control over supply and quality as well as lower transportation costs, especially for perishable food items such as mushrooms. Del Monte Corporation purchases fruits and vegetables from more than 100 small outgrowers in Manila (see case 3.4).

Case 7.3 Integrated urban farming in Pikine, Dakar

In the community of Pikine in Dakar, Senegal, a cooperative of small entrepreneurs has succeeded in farming in an unbuildable, wetland area of tribal land. The farmers, who are mostly men, grow vegetables under trees and raise livestock, primarily for the market. The marketing is done by women. Both men and women process and market related products such as dried fish, tanned leather and handicrafts made of palm frond. In addition, the marshier parts are leased to rural itinerant rice farmers and the rent used for common projects.

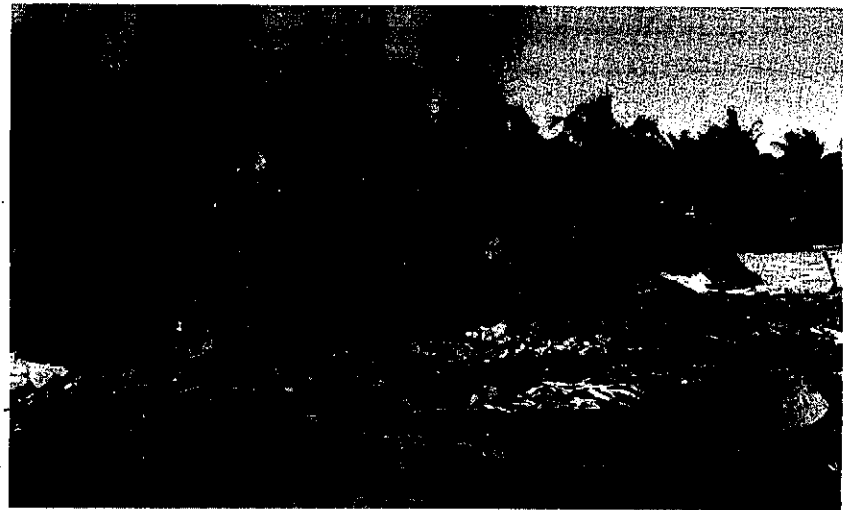


Photo 7.7 Drying fish in Pikine, Dakar. The waste is reused as compost for vegetables.

The farmers follow sustainable agricultural practices, using waste from households, markets and animals to fertilize the soil. In some cases, wastewater is deflected from sewage pipes to irrigate the crops; in most cases, water for irrigation is lifted by hand from shallow wells.

The animals are raised in the home compounds and grazed in turn by tribe members on roadsides and vacant land. The women marketers buy fish from fishermen, process the fish and barter the waste to the farmers for fertilizer.

The farmers cooperative operates under the leadership of an elected president, who is also their tribal chief (photo 5.4). The farmers receive political support from the city mayor and technical assistance from the Centre pour le Développement de l'Horticulture, a government research institution working on horticultural techniques such as raised-bed monocropping. The institution is partly funded by the Food and Agriculture Organization.

The success of the farming activity stems from a strong organizational structure and the integration of marketing, processing and land management.

Contact: Dr. Amadou Mochtar Diop, Rodale International, B.P. A237, Thies, Senegal.

Large enterprises employing farmers or maintaining outgrower contract relationships with them bring to the farmers the benefits of organization and scale economies. The agribusiness organizes marketing, financing and technical assistance, allowing the farmer to concentrate on production. The farmer is also ensured the purchase of all his produce so long as it fulfills the quality-control requirements. The large enterprises utilize their size to gain access to markets and market information as well as credit—difficult for small, individual farmers to obtain.

Urban agriculture is an easy industry to enter. It can be started on a small scale, on informally accessed land (paying no or little rent), with few and inexpensive inputs and limited technical knowledge and skills. The output at this stage is usually low and inefficient, but an enterprising farmer can, over time, improve the inputs, increase skills and knowledge, enhance the efficiency of production and widen the scale of the activity—all with small incremental investments. However, poor farmers have little or no financial capacity to absorb economic shocks, especially when they have little official support.

Urban agriculture provides opportunity for unskilled youth, homebound mothers and the aged to participate in commercial activity. In Lusaka, for example, urban agriculture provides jobs for those whose skills do not qualify them for formal sector jobs—including women, teenagers and retirees—at a higher rate than other informal sector activities.¹⁷ Much urban agriculture work can be done at any time of the day; there may even be certain advantages to working outside busi-

ness hours (butchering, harvesting for later the same day or next-day sale). Many tasks can be done on weekends.

In Maipú, Chile, on plots as small as ten square metres, gardeners produce herbs and spices, which they process and package at home. The most dramatic example of enterprise development is probably that of a multi-millionaire urban agriculturist who began by selling eggs door-to-door, from chickens he raised on his parents' back porch in Jakarta (case 7.4).

Case 7.4 Income generation and enterprise development in Jakarta

In the early 1970s, Bob Sadino, a young high-school graduate in Jakarta, Indonesia, recognized the market for specialty food products and began a business that has turned into a multimillion-dollar urban agriculture success story. He began by importing chicks from the Netherlands, raising them in his parents' backyard and selling the eggs door-to-door to neighbours.

Sadino expanded his business activity rapidly, selling chicks to other poultry farmers and dressed chicken to luxury hotels while continuing the door-to-door sale of eggs. In about four years, he had established a retail sale outlet in his family home and then purchased a meat processing plant, where he processed chicken as well as other meats.

Within a few years, Kem Chicks concentrated on processing, wholesaling and retailing. The enterprise produces specialty products for which there is less competition; high quality and reliability allow the company to command higher-than-market prices. A national or international expert is generally called in to set up production and train staff in new products. Kem Chicks also provides support to its medium- and small-scale outgrowers.

Kem Chicks now also includes a hydroponic vegetable farm, established with the help of a Japanese expert, and field farms of vegetables in the peri-urban area. High-value, rare vegetables are grown for the market and distributed overnight after harvesting to maintain freshness.

Kem Chicks exports several food products, including dried fruit, to Singapore. The company currently employs about 800 people in addition to the outgrowers.

Contact: Bob Sadino, Kem Chicks Homeshopping Centre, Kebayoran-Jakarta Selatan, Jakarta, Indonesia.

The economic base of cities is particularly strengthened because urban agriculture is counter-cyclical in nature. Food is a basic consumption item with a fairly inelastic demand. Thus even when the economy is depressed, urban farming can still sell its products.

The national agriculture sector and urban food supply

Urban agriculture not only contributes to improved economic conditions for individuals and families; it offers a variety of macroeconomic

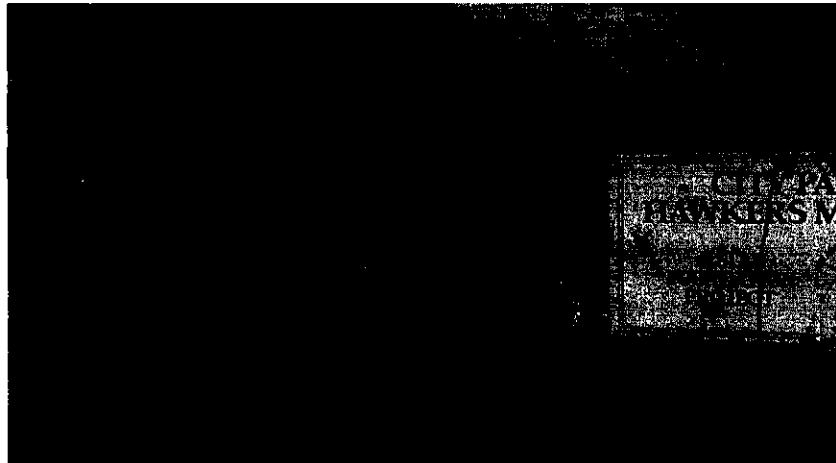


Photo 7.8 Hawkers market in Nairobi. Such markets, whether organized formally (here with support from the Asian Foundation) or informally, provide crucial outlets for the products of small producers, improving the access of urban residents to fresh food.

benefits as well. In most countries, food is among the largest industries. In many places, a significant portion of food production occurs within urban regions, and urban farming is a well-established and extensive industry (see table 2.2). In addition to being the main source for non-cereal nutrition of a large proportion of the urban poor, in many countries urban farming satisfies a significant percentage of the urban food demand, comprising a fair share of the nation's agricultural industry.

The US Department of Agriculture found that one-third of the US agricultural product (in dollar value) is produced within urban metropolitan areas, on one-ninth of the agricultural land.¹⁸ Eighteen large cities in China produce 90% or more of their vegetable demand and a significant portion of their fish and small-livestock protein demand within their metropolitan regions,¹⁹ while Hong Kong supplies 45% of its vegetable demand. Urban agriculture is a major industry in these countries, in part through a policy decision to pursue urban food self-sufficiency.

In countries where food and fuel represent an even larger share of the total economy, urban agriculture may have an even more important economic share. Russia's small farmers produce 30% of its agricultural product on 3% of the land, and two of three families in greater Moscow farm on a small scale, up from one-fifth in 1970.²⁰ Kampala produces most of the poultry consumed by its residents. Bamako,

Mali, produces all of its vegetables, as does Ouagadougou, Burkina Faso.

In the urban areas of low-income countries, 40–70% of the family budget is spent on food and fuel (table 7.3), with the poorest people in those cities paying 60–90% of their budgets. Thus urban agriculture can make a substantial contribution to the economic activity of a community or city.

Urban farming is an integral part of the urban food supply in most lower-income countries. It tends to provide products that rural farming cannot supply as well—perishables that suffer in transport,

Table 7.3 Cities among the world's 100 largest metropolitan areas that spend 50% or more of household income by all income groups on food.

City	Country	Spending on food as percentage of income
Ho Chi Minh City	Viet Nam	80
Lima	Peru	70
Katowice-Bytom-Gliwice	Poland	67
Dhaka	Bangladesh	63
Kinshasa	Zaire	63
Bangalore	India	62
Calcutta	India	60
Guangzhou	China	60
Istanbul	Turkey	60
Lagos	Nigeria	58
Bombay	India	57
Pune	India	56
Algiers	Algeria	55
Nanjing	China	55
Shanghai	China	55
Wuhan	China	55
Harbin	China	54
Recife	Brazil	54
Beijing	China	52
Shenyang	China	52
Tianjin	China	52
Alexandria	Egypt	51
São Paulo	Brazil	50

Note: In a comparable number of cities, 40–49% percent of household income is spent on food. Source: Population Action International, *Cities: Life in the World's 100 Largest Metropolitan Areas* (Washington, D.C.: Population Action International, 1990).

high-value crops that need close monitoring of the market and certain export crops that require rapid delivery when ready. It is thus complementary rather than competitive with rural farming. It contributes to the national economy and increases the efficiency of the food supply.

Urban farming is particularly important in countries where the national agricultural marketing infrastructure has failed to catch up with the growth in urbanization, in order to feed the cities. This is true in most rapidly growing cities in Africa. The importance of urban farming also increases when the rural food supply or the national agricultural marketing infrastructure is disrupted, as happened due to civil strife in several cities, including Baghdad and Sarajevo.

In addition to contributing to the city's food supply, urban agriculture helps low-income farmers produce food they cannot afford to buy. This, too, does not displace rural supply, as the poor have limited financial resources to purchase food from the market.

Most developing-country food imports are undertaken to feed the cities. Egypt and Tanzania are two well-documented examples of countries that import food with a priority for their urban population. Urban agriculture can substitute for some of the imported food and provide the benefit of saving foreign exchange.

Many developing countries face the late 1990s deeply in debt and with a poor foreign trade balance. For some of them, it is possible and appropriate to put their good rural agricultural land into export crops and to let the cities provide for their food and fuel needs as much as possible through urban agriculture (case 7.5). Self-reliant cities thus advance rural agriculture's export goals. Nicaragua's government, for example, has made a decision to earn foreign exchange in the next few years through agricultural exports.

Case 7.5 Urban farming for import substitution in Sri Lanka and Ghana

The economic consequences of the structural adjustment programmes of the 1980s are well known. In some countries, economic conditions had been worsening since the mid-1970s. One common response was to earn foreign exchange by exporting rural crops—the same crops consumed by urban areas. Policies were also instituted to encourage urban residents to grow their own food to save money and ease the economic situation (these efforts in Papua New Guinea and Zambia are described in cases 5.8 and 9.1).

Sri Lanka found itself in a balance-of-payments' crunch because of the need to import rice, wheat and other foods. Import restrictions imposed to save foreign exchange resulted in price increases and a short supply of food. To ease the problems, the government encouraged the consumption of indigenous staple crops

including manioc, yams and dry grains, which urban residents farmed in school gardens and in their backyards.

In Ghana, Operation Feed Yourself had considerable success during its four-year life (1972–76) in reducing imports for manufacturing and feeding the cities. Plantain crops increased from 202,000 to 840,000 acres; for okra, the increase was from 18,000 to 42,000 acres. Urban farmers associations operating today date to this period and still focus on urban farming for self-consumption.

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Finally, in a world that is facing the possibility of food shortages, an expansion in urban agriculture can reduce the pressure on rural land, especially the push onto new agricultural land. Intensified production methods mean that more people can be fed on existing cultivated land without putting additional stress on marginal lands.

Economic use of land

Urban agriculture is thriving in a variety of settings, from rich Tokyo to poor Kampala and from high-density Hong Kong to low-density Managua. Still, a common skepticism exists that agriculture cannot pay urban land rent and that it is inappropriate to provide urban infrastructure for agriculture. However, as discussed in chapter 4, legality of tenure, rather than the availability of land or the competitiveness of farming land use, is the main problem.

Urban agriculture is an economical use of land for a number of reasons:

- ▼ It generates income from temporarily available land at the growing periphery and at the renewing core.
- ▼ It puts idle water bodies, wetlands and steep slopes to productive use and maintains the land.
- ▼ It generates income from idle, unbuilt parts of oversized facilities (hospitals, factories, military bases, airports and so on).
- ▼ It is a compatible open-space use in parks, sports facilities, universities, roadside verges, utility rights-of-way, riparian and floodplains along rivers and bays, cemeteries and other locations.
- ▼ It is a competitive land use in many cases (for example, poultry farms and horticulture on the outskirts of cities).

