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**The future of  
urban agriculture**

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## Promoting urban agriculture through policy and action

Capturing the many potential benefits of urban farming, solving the problems that often accompany it and overcoming the obstacles to its further development will require policies and programmes to promote and regulate appropriate urban agriculture. This chapter suggests how to accomplish this challenging task.

Field visits and observations, a review of the literature and workshop discussions have revealed that most of the actions required to promote urban agriculture are being practised today in cities and countries across the globe. Much can be learned from the success stories as well as from the cautionary tales.

The next section considers the types of interventions that can be implemented to increase the range and effectiveness of urban agriculture. A second section focuses on which interventions are most appropriate at the community, city, national and international levels.

### **Interventions within and across sectors**

If urban agriculture is to achieve its full potential, interventions are needed to:

- ▼ Increase public knowledge and support
- ▼ Build political will
- ▼ Improve organization and communication among farmers
- ▼ Develop a policy framework and build institutional capacity
- ▼ Expand research and training
- ▼ Improve access to resources, inputs and services
- ▼ Maximize health, nutrition and food security
- ▼ Achieve sound environmental and urban management.

## Increase public knowledge and support

Broad appreciation of the benefits of urban agriculture is urgently needed to overcome both traditional and modern biases. Public information aimed at current and potential service organizations is perhaps the most effective tool to transform the industry from its cottage status into a major instrument in the battle against hunger and poverty. The means will vary with the organization being targeted. Local support organizations (non-governmental organizations (NGOs), community organizations and farmers organizations) can be reached most effectively through articles in newspapers and network newsletters, workshops and national and international networks of similar organizations. Development agencies, government agencies and researchers can be reached through journal articles, well-targeted newsletter articles, conferences and workshops.

Information about the benefits of urban agriculture is beginning to appear regularly in the mainstream news media.<sup>1</sup> But, as with most news reporting, the press pays more attention to bad news than it does to success stories. More balanced and analytical reports are needed.

Educating the next generation is critical to making urban agriculture a broadly understood and accepted industry. Primary agriculture education in schools—perhaps including outdoor environmental/agricultural classrooms—is therefore an essential component of any action plan to educate the public. Vocational training in urban agriculture practices can also be incorporated into the secondary school curriculum.

## Build political will

Even in countries like Chile and the United States, where there are more urban than rural farmers, urban farmers remain invisible to both legislators and government administrators. Without political will, the legislative and policy changes needed for urban agriculture to achieve its potential will not be forthcoming—even if the public understands the benefits.

Political will can be informed and created through “policy training”. For example, one- or two-day leadership forums could be held to give politicians an opportunity to learn more about the contribution of agriculture and the challenges it faces directly from community and city leaders. Such forums could be facilitated by experts in

urban agriculture, environment, health and related topics to ensure full consideration of all critical areas. Field trips to production sites and to cities or countries where urban agriculture is well managed will also go a long way to convince political leaders and government administrators of the benefits of urban farming.

With the support of the United Nations, many cities worldwide have adopted policies and programmes for becoming a “green city”, an ecologically “sustainable city” or a “healthy city”. Such policies and programmes also contribute to building political will. Green cities and healthy cities are empowered by urban agriculture. A programme of “cities that feed themselves” could help build political will for urban agriculture.

Regional and global forums can also produce significant results. During 1994, urban agriculture was discussed by civic leaders, including mayors, at a global forum in Manchester, England, and at an international colloquium of mayors in New York City.<sup>2</sup> The 100 mayors assembled in New York City agreed that urban agriculture (along with job generation and microenterprise development) would be their first action to fight poverty.<sup>3</sup>

In many countries, relevant data can contribute to building political will. In places where politicians respond to appeals to support the farmer (rather than simply the agricultural product), data on the number of urban farmers and their contribution to urban and national well-being will be invaluable. Urban farmers in Italy, Japan and Germany already have a political voice.

Efforts to build political will are needed in all of the sectors in which urban agriculture is effective: food, energy, urbanization, environment, agriculture and health. However, as long as urban agriculture continues to be as unorganized as it is in most countries, the political will to support it is likely to be missing. Organizing farmers will therefore continue to be a front-line intervention.

## Improve organization and communication among farmers

As previously noted, the general lack of organization among farmers—especially lower-income farmers—is partly due to their physical isolation from each other. For this reason, efforts to educate the public about the agriculture sector and its benefits should include farmers as well.

Also important are interventions to help farmers organize into cooperatives and associations and to facilitate the development of existing organizations. Assistance may also be needed to enable some existing NGOs to take on urban agriculture; new NGOs could also be established, with input or direct participation of farmers. All these actions would ultimately create economies of scale, making urban farming more competitive and more profitable.

As communication contributes to an ever-shrinking world, it is increasingly common to borrow forms of organization across national and continental boundaries. Models of ideal organizations and work plans for this "new" urban industry are urgently needed.

A participants network can facilitate communication among farmers as well as information dissemination. The Urban Agriculture Network is one such network, as is the network formed recently in Latin America; a network is also being formed in Asia. Such networks can reach urban farmers; they also can help to coordinate actions with intermediary agencies. Networks in related areas such as nutrition, sustainable agriculture and microenterprise development can be linked.

Finally, improved organization of farmers would have benefits for production as well as improved access to preproduction and post-production facilities.

### **Develop a policy framework and build institutional capacity**

Initiating or significantly increasing the scope of urban agriculture will require changes in government policy as well as in the functions and priorities of some agencies and institutions.

National policy has an important role to play: governmental designation of agriculture as a beneficial urban land use and economic activity is likely to provide critical impetus to the industry's growth and success. In general, if policy addresses urban agriculture at all, it tends to make the practice illegal. More logical policies are needed on the type and location of cultivation and livestock that are permitted. The choice of policy tools available to municipal and national governments include legislation, public education, structured incentives and retrofitting agencies to regulate and support urban agriculture.

Endorsements by high-level public officials—such as those by Zambian President Kaunda in 1977 and Tanzanian Prime Minister

Sokoine in 1980—can have a powerful, positive effect on public officials' view of urban farming. And by including urban agriculture in census and other data collection, governments can send an important signal about the key role the industry plays in the national economy.

In most cities, provinces and countries, urban agriculture does not come under the exclusive agenda of any ministry or government department; it therefore falls between the cracks. The appropriate department to oversee urban agriculture will vary from country to country; possible candidates include the ministries of urban development, agriculture, environment and labour. Where urban agriculture is part of a national government's agenda, it most commonly is part of the agriculture ministry.

None of the studies reviewed during this investigation compared the administrative organizations and regulatory frameworks of cities that support urban agriculture and those that do not. The differences in health codes and enforcement, food regulations, environmental regulations, police accountability, waste management administration and so on should be examined. Comparative studies will provide important input in designing alternative institutional structures needed to manage urban agriculture.

Training is needed to build the institutional capacity to provide effective oversight of the sector's activities. Most crucial will be training for government personnel who will monitor the riskier techniques used in urban agriculture. In particular, the application of solid and liquid waste to farming will need to be managed carefully.

### **Expand research and training**

The most pressing research need is to develop tools to eliminate the constraints that hinder urban agriculture's development and solve the problems associated with current practice.

Studies and data are needed to help urban farmers gain credit ratings from banks, to improve small-scale producers' access to wastewater, to assist agribusiness in serving urban farmers, to give the same urban agriculture opportunities to low-income mothers as are now available to well-financed businessmen and to make food produced within cities consistently safe. Research to increase productivity and improve the environmental, health and urban management record of urban agriculture is also needed.

Urban agriculture is an emerging research field, and its parameters and methods must be defined. Urban agriculture was “discovered” separately by social scientists, urban planners and agronomists. Each discipline brought its own past practice to the “new” field. Research methods used in urban agriculture today are an eclectic mix. A focused, short-term effort is urgently needed to reach agreement on research methods among the small number of urban agriculture researchers so that greater comparability across data sets becomes possible.

**Conduct baseline and farming system surveys**

Surveys are needed to generate data on the current state of urban agriculture as well as projections of its future potential. These data are needed both to convince investors, supporters and promoters of the benefits of urban agriculture and as input into the process of formulating policies and interventions for this sector. The impact of future interventions can be measured against this baseline data. Specifically, data are needed on:

- ▼ The extent of urban agriculture
- ▼ The structure of the sector
- ▼ Demand and supply
- ▼ Input and output markets and links
- ▼ Efficiency of the production activity
- ▼ Technologies and farming system mix
- ▼ Nutritional and health impacts of farming
- ▼ Environmental impacts.

Both baseline surveys and farming system surveys will reveal the current status and extent of farming in a particular city. A baseline survey could include a land survey to establish which parts of the city are currently farmed and which could be farmed. It could also include a market survey and a household survey to establish the percentage and type of residents who are farming as well as details about the farming activity. A number of broad-based surveys have been undertaken in the past few years. It may be feasible to review the best of these surveys with a view to devising an efficient baseline-survey instrument.

Farming system surveys study a particular farming system or sub-system in depth (for example, horticulture and fisheries or, more specifically, hydroponics or wastewater-based lagoons). Farming system surveys identify the production process, producers,

technologies, inputs, markets, linked sectors (input and output industries, credit agencies, extension and research agencies), beneficiaries and ecological, economic and social impacts. Such surveys are needed to define the existing and potential benefits, as well as the needs (research, credit and so on) of each farming system. They should also provide information on the linkages among farming systems; information on any synergy between specific crops and, more broadly, between systems is crucial to the design of successful urban agricultural systems.<sup>4</sup>

**Identify and transfer best practices, models and technologies**

The most appropriate urban agriculture technologies in any city or country often can be found by seeking the local “best practice”, that is, the farmers who produce the greatest output per unit of land or labour. The goal would then be to advance the production level of all farmers to that of the local best practice. Interventions may be needed to document the best practice, to arrange farmer-to-farmer visits and to support the best-practice farmer to become a teacher and coach.

Model or pilot projects are needed to identify for policy-makers, research organizations, bankers and support agencies what the benefits of urban agriculture truly are. Projects are also needed in some countries to provide farmers organizations and government departments with models for investment. (Case 5.3 reports on the success of this approach in Viet Nam.)

Interventions to support technology transfer have many successful examples in some farming systems, particularly aquaculture. Support for these programmes is quite urgent to increase not only yields, but also the number of crops, as well as to advance “safe food” methods. Technology transfers are generally easier to accomplish within a country or region rather than across regions. Thus the last decade’s spread of popular hydroponics from Bogotá has been limited to Latin America.

Four types of training are urgently needed for this burgeoning industry:

- ▼ Policy training for executives and politicians
- ▼ Management training for NGO directors and heads of government agencies
- ▼ Extension training for government and NGO extension agents
- ▼ Production and business training for farmers.

Training in urban agriculture generally is best accomplished by the farmers themselves. In this way, a farmer who is proficient in a best practice passes his skill and knowledge directly to another farmer. Similarly, the leaders of the most effective NGOs should train other NGO leaders within a country.

### Improve access to resources, inputs and services

One of the greatest obstacles for urban farmers is a lack of access to credit. Possible means of increasing the amount of credit available to urban farmers include (a) providing a special line of credit for urban farming entrepreneurs, (b) reserving part of an existing agricultural credit quota for urban farmers and (c) including urban farming among the industries eligible for special small-enterprise support.

Urban farmers often do not achieve maximum yield on a new site for three to five years. Support programmes, or soft loans with possible delay of repayment during the first couple of years, therefore may be desirable in the early years of promoting urban agriculture in a particular town or city.

To improve the access of small- and medium-scale urban farmers to markets and to market information, government departments could (a) create market-places for small farmers, (b) provide incentives for operators in the market to cater to small- and medium-scale urban farmers or (c) help farmers to form marketing cooperatives. In most cities, research will be needed before such programmes can be initiated. Moreover, business and other training for farmers can help them better plan their crop choices and manage their products up to the point of sale.

Finally, urban agriculture requires strong links with other industries to achieve its potential (see chapter 6). Interventions by NGOs, community-based organizations or municipalities may be needed to ensure the timely establishment of these links, especially for small-scale producers and processors.

### Maximize health, nutrition and food security

Safe food is a prime concern of public authorities as well as many families. Dependable year-round access to a well-balanced diet is the prime concern of at least half of urban residents in Asia, Africa and Latin America who live at or below the poverty line. Urban agriculture can contribute to improving both food safety and food security.

In urban and rural areas alike, chemical and organic pollutants are of concern. In urban areas, the controls need to be more stringent because farming is in close proximity to dense human activities. However, enforcement may be easier to carry out because the activities are not dispersed in remote areas and are more accessible to hygiene specialists.

Food safety standards have been published by several international agencies, but these are global and must be adapted to match each city's conditions and farming systems. Regulations are needed to control which crops are grown where and which farming methods are used (for example, peas can sometimes be grown where lettuce is inappropriate).

To some degree, where there is a good information system, the market will assist the regulatory function. In La Paz, Bolivia, vegetables grown above the city sell at a higher price than those grown below it because the market recognizes that polluted irrigation water flows downhill.<sup>5</sup>

The question has been raised whether it is reasonable to expect weak local governments to regulate agriculture within and at the edge of their cities. In general, prohibiting urban agriculture completely has been found to be infeasible, in part because of its extensive nature and farmers' economic need. Some countries, both more and less developed, have regulated urban agriculture successfully for decades. Most countries today have food safety regulations, but there are gaps in enforcement. Assisting municipal and national governments in devising ways to effectively control urban farming practices may be one of the most necessary interventions.

Regulations can be introduced on a step-by-step basis. First, the most dangerous problems and most urgent needs are targeted, for example, prohibiting the use of industrial and hospital waste as agriculture inputs, disallowing certain crops on highway verges and checking irrigation water quality at a few points seasonally. The use of secondary indicators, such as levels of diarrhea, may provide a guide to trouble spots or dangerous processes. Then, gradually, less urgent issues can be addressed.

A case in point is the situation in Asmara, Eritrea. More than one-third of the vegetables consumed in the city in 1994 were produced with sewage irrigation. There is no short-term alternative source of vegetables within the country, and importing vegetables is not financially or physically feasible. A step-by-step programme of enforcing

regulations that ensure adequate wastewater treatment may be appropriate to prevent outbreaks of contagious diseases.

Strategies to achieve a more equitable distribution of food and to increase the food security of the poor include food subsidies, rationing, food stamps and differential pricing. However, subsidies and price controls are costly measures that are difficult to target to needy populations and, like rationing and food stamps, they create dependence on food assistance. Urban agriculture, by contrast, makes the target population nutritionally self-reliant and empowers it. Because urban agriculture is a self-sustaining strategy that can reduce future dependence, it reduces the burden on public resources.

In her analysis of urban nutrition policies, Atkinson identifies the advantages of farming for self-consumption relative to other measures: it "generates independence, makes use of idle resources, improves the quality of the environment, increases the amount of available resources and establishes new bonds between the urban and natural environments which seem increasingly important for the city as a whole."<sup>6</sup>

For low-income residents, urban agriculture-related nutritional support measures might include extension services and access to land on a permit basis. Programmes directed towards the poorest of the poor can additionally include provision of subsidized inputs and water and low-interest credit without collateral requirements. Such interventions to promote community production of food not only cost less than direct food aid; they have the additional advantage of being temporary.

In the case of middle-income residents, interventions could be designed to provide nutrition education, extension support and improved access to needed inputs, resources and markets.

Policies and regulations favoring urban agriculture should recognize the important environmental health benefits of maintaining otherwise derelict land and water, improving physical access to food (in portions of the city poorly served by food outlets) and enhancing the quality of the food produced.

Where malnutrition is endemic, the health care system could promote farming as a strategy to ensure family and community food security and greater family control over the nutritional content of meals. In Lusaka, for example, agencies encourage the poor to produce vegetables for consumption to increase their vitamin and micronutrient intake.<sup>7</sup> School, health clinic and community garden programmes

can also promote community and home farming as a nutritional solution, as illustrated by the case of the *comedores populares* in Peru (see case 7.1).

Development agencies with programmes to help the rural poor improve micronutrient intake through farming vegetables, fruits and livestock in home and community farms include Africare, Save the Children Federation, Plan International, CARE and UNICEF. These international agencies could expand such programmes to include the urban poor.

Poverty reduction and economic development programmes can go a long way towards achieving their objectives by including urban agriculture among their strategies. In some urban communities, families spend more than 80% of their income on food and fuel. Food security frees money for expenditures on other items, thereby promoting economic growth. It also drives entrepreneurship. Any intervention to promote urban agriculture is therefore an economic intervention.

In many cities, more than half of the microenterprises are engaged in food production and food processing. Trickle-Up Program found in 1994 that 60% of its 8,000 very small enterprise projects were food related.<sup>8</sup> Towns and cities with economic development goals can do well with urban agriculture projects in both poor and middle-class communities.

## Achieve sound environmental and urban management

One of the biggest policy changes in government today is the inclusion of environmental policy in urban policy. As described in chapter 1, the goal of replacing open-loop systems with closed-loop systems should lie at the core of environmental policies. Urban agriculture can be an integral part of a set of policies that advocate closed-loop development.

Green spaces improve the living environment, aesthetics and climate. Policies to promote such greening efforts should be based on productive landscape principles: gardens can be a mix of farming and recreation space, and street trees can be fruit- and nut-bearing. Farming reduces and privatizes the maintenance cost of such green spaces because the farmers maintain the land while they farm it. Cities as different as Chicago and Addis Ababa have agroforestry programs to improve the environment and climate and (in the case of Addis Ababa) to provide an improved fuel wood supply.

### Land use management

In most developing countries, farming is not included in urban land use policy. Cities would do well to include urban agriculture as a land use that works towards a more balanced and ecologically sustainable urban development pattern that conserves natural resources. Zoning and building regulations could be used to shift urban development planning towards "productive landscape", thus opening up opportunities for urban agriculture. Transforming polluted land into productive land is a key concept.

When urban land uses include agriculture, city planners have greater leverage; they can place into productive use lands that are unsuitable for built-up uses or those that have a particular natural resource value (for example, aquifers). Thus land rent is increased and natural resources are conserved.

To adopt a policy of urban agriculture as a productive land use, planning departments need to identify public spaces that should be put to farming use as well as unbuildable areas (public or private), such as steep slopes and marshes. Most cities have significant amounts of vacant public land where farming is practical.

The potentially available land can be categorized as government-owned land, land owned by public agencies, privately held land or hazard-prone land. The particular policies needed to make land available for farming depend on the land ownership patterns in the country or city. In cities where the government owns a large share of the land, it may be easier to provide land for farming through policy measures.<sup>9</sup>

Sanyal has suggested five policy measures to provide urban land for farming:

- ▼ Give farmers access to public vacant land
- ▼ Induce owners of private land to allow temporary access for farming
- ▼ Put land around public facilities, such as schools, ports and hospitals, to farming use
- ▼ Improve land for agriculture and aquaculture by dredging, filling, levelling, terracing and so on
- ▼ Design site/service areas for squatters and other low-income residents to provide them with farming space.<sup>10</sup>

In reclaiming derelict land, the government can follow a policy of allotting land to volunteer low-income farmers in return for reclamation

work. Including space for farming in government housing schemes for low-income residents would benefit the government by increasing residents' income and thus their ability to make monthly payments. To keep control over land that may be needed for another use in the future, lease agreements specifying the duration may be appropriate, whether the landowner is public or private.

Other appropriate interventions in land use management and planning include:

- ▼ Cost-benefit analyses of the use of various lands and water bodies for farming, as input into the planning process
- ▼ Legal structures for tenancy agreements and use of land for farming
- ▼ Regulations restricting farming on fragile lands, lands needing conservation, floodplains, steep slopes and land over aquifers.

Most of the arguments made here about access to land apply equally to surface water in ponds, lakes, rivers and estuaries. However, access to water bodies by government permit is usually obtained more easily than access to land that forms part of the public domain.

Urban agriculture can be a beneficial component in many urban projects. In a housing project, for instance, urban agriculture can make productive use of some of the unbuildable portions of the site, thereby improving the rate of return. It may also provide income during the build-out period of the project. Infrastructure projects can benefit when rights-of-way are put to productive use or urban agriculture provides maintenance of open spaces, such as those at an airport. Urban agriculture is also an excellent buffer, for safety or other purposes, between incompatible land uses. Industrial sites with long build-out phases can benefit from urban agriculture for years. Park land acquired for future use can serve to feed the city until it is needed for leisure. Agriculture is also a good interim use of land in urban renewal sites at city centres.

### Disaster management

Urban agriculture can be included as a strategy in a city's disaster management policies. Traditionally, flood disaster management strategies have included damming rivers and leaving floodplains and steep slopes vacant. Urban agriculture is a more sustainable and preventive strategy. By planting crops and trees upstream and on steep slopes, soil erosion and excess runoff can be prevented and disasters avoided.



The planting of crops and trees across a flood path reduces the force of the water.

A partial answer to a drought crisis is to promote urban farming methods that use little water. Finally, economic and political disasters are often mitigated by urban agriculture. Sarajevo is the best known recent example; Baghdad is another.

**Waste management**

Urban agriculture can play an especially vital role in waste management—both waste that is usable in farming and waste created by farming. Transformation of waste into food and fuel is essential if a city is to attain the full benefit of urban agriculture.

Citywide waste management systems are usually centrally managed, making it virtually impossible for farmers to have legal access to the wastewater and solid waste. A new approach is needed in which collection, sorting, treatment and recycling take place at the community level in cooperation with local organizations.

Local waste management systems can be introduced on an incremental basis, beginning in areas with greatest potential to use the waste in farming. Government requests for proposals could produce a range of alternative approaches to handling biological wastes using both traditional and new technologies.

Policy changes are also needed to move towards a wastewater management system based on purification through aquatic plants and animals as well as reuse of the purified water for irrigating urban and peri-urban fields. Well-tested and -established examples of both processes exist and can be gradually implemented, perhaps beginning with sewage lagoons. Biological processing of wastewater and solid waste makes urban agriculture both more affordable and more sustainable.

To prevent food contamination, new standards and procedures need to be instituted for processing and treating wastewater and solid waste, as well as for applying them to farming. Standards developed by the Food and Agriculture Organization, the World Health Organization and some industrial countries can provide a start.

For centuries, provision of water has been recognized as an appropriate function of local government. Once agriculture is again recognized as an appropriate urban industry, policies to provide it with controlled access to wastewater (as well as to surface and groundwater) will also become appropriate.

**Intervening at the most effective level**

This section addresses the four levels at which action is needed—the community, city, national and international levels—and discusses the interventions appropriate for each one (summarized in table 10.1). Many of the interventions can occur at more than one level. Most of the national and international interventions serve to facilitate the interventions at local levels.

**Table 10.1 Community, city, national and international roles in promoting urban agriculture**

Activity	Role			
	Community	City	National	International
<b>Research and information</b>				
Survey and document	▲		▲	
Disseminate information	▲	▲	▲	▲
Conduct research				▲
Create model codes and standards			▲	▲
<b>Projects</b>				
Include urban agriculture in projects	▲			▲
Create model projects				▲
Conduct training	▲			▲
<b>Access to services and resources</b>				
Improve access to inputs and services	▲	▲		
Provide research and extension		▲	▲	
Improve access to credit	▲	▲	▲	
Create and structure markets		▲		
Provide financial incentives			▲	
Provide access to public land, water and waste		▲	▲	
<b>Policy and planning</b>				
Adopt policies linking urban food and nutrition with urban farming		▲	▲	
Integrate urban agriculture into planning (food, energy, waste, land use and environment)		▲	▲	
Enact legislation		▲	▲	
Regulate		▲		
Develop institutional capacity		▲	▲	
<b>Cooperation</b>				
Foster global and regional cooperation		▲	▲	▲
Foster cooperation among involved groups and individuals	▲	▲		
Help farmers to organize	▲			▲

Source: The Urban Agriculture Network.

Because most of these interventions have been discussed in the previous section, they are not detailed here.

## Community-level actions

Community-level interventions that can be carried out by community-based organizations, local NGOs, farmers associations and ad hoc committees include the following:

*Integrate urban agriculture into ongoing projects and activities in education, environment, food, health, housing, community development, waste management and so on.* Urban agriculture flourishes in partnership. In isolation, it has the greatest potential to cause negative impacts.

*Conduct surveys to document the status of urban agriculture, and inform local government, institutions and the public of the survey results.* Typically, the extent and character of urban agriculture in a city are poorly understood. Community leaders may choose to conduct a survey (possibly assisted by secondary school students) and to make a visual record to share with interested groups and individuals.

*Improve access to land, water, credit, extension services, inputs and security.* Action in this area may require interaction with municipal, state, banking, business and other organizations. Survey data and other evidence will help make the case for action.

*Provide training in good practice.* Skills will exist in the community; these skills may need to be upgraded in light of nutrition, health, environment and enterprise concerns and opportunities. Best practices will be found within the community or in nearby communities. Farmers skilled in each best practice should serve as teachers and coaches.

*Establish partnerships with NGOs, the municipality, a university, the media, food and health authorities and rural farmers.* Community organizations have a role to play in facilitating access to technology, market information, technical advice, crop security and so on.

*Assist in organizing urban farmers.* In some cases, farmers will require assistance from community groups to establish an effective affinity or solidarity organization.

## City-level actions

City governments and other citywide organizations can undertake the following actions:

*Initiate a citywide study and discussion programme as background to formulating and adopting a policy of regulating and/or promoting urban agriculture.* This action can be taken in concert with community groups, affinity groups, other cities and national organizations. It can also have input from international organizations.

*Adopt enabling legislation.* Modifying health and land use regulations is the most common way to encourage urban agriculture. National government support may be required.

*Recognize agriculture as an urban industry.* The distinction may vary to include food and fuel production, waste management, environmental and land management and community development. Urban agriculture also should be included in the municipal data collection system.

*Create an institutional structure to promote and regulate urban agriculture.* One possibility is for the municipality to establish a department that provides extension and information.<sup>11</sup> Urban agriculture requires up-to-date information on markets, disease, inputs, security and so on. The municipality can provide such a service independently or in cooperation with other groups. In concert with banks and technical institutions, the city can offer credit and extension services. Municipal policies giving citizens the right to farm idle or "sleeping" land with the permission of a local council would help to secure tenure for many small entrepreneurs.

*Create a city-level food system plan, including both rural and urban supply sources.*<sup>12</sup> A food and energy partnership between a city and its hinterland can be beneficial to both through sharing information as well as resources.

*Integrate the waste management system with the food system.* An integrated system includes collection of waste, treatment, supply to urban agriculture and monitoring of the entire process (see case 9.3).

*Establish a programme and plan for achieving environmental sustainability utilizing urban agriculture.* For most larger cities, urban environmental sustainability should include municipal or metropolitan programmes for food and fuel production. These would include forestry and disaster mitigation.

*Prepare a land use plan and regulation system that provides access to land, water and markets for urban farmers.*

*Establish and regulate a public and worker safety programme.* If poorly practised, urban agriculture is dangerous to its workers and to the public. Regulations, developed in conjunction with farmers and communities, are needed.

*Provide support for disadvantaged citizen groups.* Urban agriculture is particularly effective as a poverty-fighting tool and especially appropriate for women's initiatives. Municipal programs to eliminate poverty and empower women can include urban agriculture.

*Structure the market and create market-places for urban farmers.*

*Provide training in urban farming methods.*

## National-level actions

Institutions that act at the national level include the national government and its various ministries, NGOs, universities and research centres. The kinds of actions they can take include the following:

*Establish an urban agriculture policy. National policy may be more flexible than city-level policy.* The concern for the impact on rural food and fuel producers may be greater at the national level. Moreover, national policy can have a great effect on city policy. Environmental policy can include guidelines for putting environmentally vulnerable and resource-critical land and water areas to conservation uses, including agriculture.

*Create a national food policy that establishes synergy between rural and urban production systems and guides an urban-rural agriculture integration programme.* This would complement food system planning undertaken by individual urban regions, particularly in small cities where planning capabilities tend to be limited. National intervention will also be called for where past national agriculture programmes have been exclusively rural and there is a need to extend research and extension to include urban farming.

*Include urban agriculture and forestry in national energy and forestry plans.* Urbanization is the prime cause of energy and forestry problems and must be included in the solution.

*Provide research and extension services.* Municipal governments generally have little capacity for research. Most national governments have agricultural research and extension facilities that can be expanded to include urban agriculture (see case 9.4). National organizations can facilitate the sharing of information among cities both within and outside the country.

*Provide tax alleviation, or subsidize inputs, for urban agriculture.* It may be appropriate to devise a system of national incentives, at least for an interim period, to realize the full range of benefits.

*Prepare model health and land use codes.* The development of model codes in areas such as public health, land use, waste management

and water conservation could significantly aid small and medium-size towns and cities.

*Conduct surveys and collect and disseminate data.* Beginning with census and employment data, there are many national or sample surveys that can include urban agriculture. National-level efforts to develop data on nutrition, land use, pollution, food systems and energy could make a significant difference.

*Facilitate access to public land and waterways.* Airports, highways, hospitals, military bases, universities, forest parks and many other nationally owned lands can be made available for urban agriculture as an interim or permanent land use. Rivers, estuaries and bays suitable for aquaculture are also typically controlled by the national government.

*Facilitate cooperation between farmers groups and both public authorities and large private corporations.* Electricity, telecommunications, ports, railroads and parks authorities are often established as extensions of national governments. Their partnership with urban farmers associations may be critical in some cities.

*Establish a system of credit.* Existing national schemes for credit to agriculture and small businesses can be extended to include urban farming.

*Establish a system for facilitating cooperation between farmers and local organizations, on one hand, and regional and global agencies that support urban agriculture, on the other.* Global organizations along with their regional branches are beginning to offer assistance in urban agriculture. This assistance can be facilitated by a national ministry that communicates with individual cities or national NGOs.

*Train trainers, leaders and monitors.* The training of trainers and leaders can be carried out on either a national or a regional basis; these leaders/trainers can then organize and oversee farmer-to-farmer exchanges and local training.

## International-level actions

Urban agriculture may not require long-term support. International support, however, is needed on an interim basis. During the next decade, assistance will be needed for start-up efforts by nations, cities and NGOs. During that time, and for a few years thereafter, some support will be needed for technical cooperation among developing countries, for special farming systems and for trouble-shooting on issues such as disease and pollution.

