Urban Agriculture
An Opportunity for Environmentally Sustainable Development in Sub-Saharan Africa

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Which environmental issues make development unsustainable in Sub-Saharan Africa and how do African societies perceive and address these issues? How has the World Bank helped its Africa borrowers to integrate environment into their development strategies and programs? And what must the Bank do to help African countries achieve environmentally sustainable development (ESD)?

Inspired by the 1992 Earth Summit in Rio, the Bank has launched a reflection process to answer these questions. In its reflection the Bank is guided by the message of Rio: without improved environmental management, development will be undermined, and without accelerated development in poor countries — which describes most of Sub-Saharan Africa — the environment will continue to degrade.

This process seeks to define the Bank’s medium-term agenda for helping its Sub-Saharan Africa borrowers attain ESD. It aims at enriching Bank staff’s dialogue with African counterparts about improving the conception and implementation of Bank ESD programs. The process should also gain the interest of a much wider audience, including an array of prominent institutions, African and non-African, public and private, universities and NGOs, and bilateral and multilateral agencies. It should encourage a debate on environmental issues which would forge wide support for new African initiatives toward ESD.

Space and time determine the process. Environmental issues are location-specific and therefore require integrating the geographic dimension. With respect to time, the process has focused on both past and future historical perspectives. The future time horizon is 2025, i.e., 30 years, corresponding roughly to a generation. Backward, the process focuses on the past decade, and the Bank’s association with Africa, in order to measure the full magnitude of environmental issues.

Within this process, about 20 thematic “building blocks” have been compiled, each addressing a specific facet of ESD issues. These “blocks,” prepared by specialists from inside and outside the Bank, fall into five categories: population, environmental knowledge, urban environment, natural resource management, and strategic instruments. The building blocks series has been the basis for the World Bank discussion paper: Toward Environmentally Sustainable Development in Sub-Saharan Africa — a World Bank Perspective.

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Executive Summary

Urban agriculture (UA) should play a key role in achieving environmentally sustainable development in Sub-Sahara African (SSA) cities. Ranging from informal garden plots to large agribusiness corporations, UA supplements rural agriculture in meeting food needs, partially meet energy and wood demands through managed forestry, recycle municipal solid and liquid wastes, and promote urban land use efficiency. UA also presents a means to generate income and improve living conditions in both urban and peri-urban areas. Notwithstanding the actual and potential benefits of UA, many SSA countries constrain urban agricultural activity, and the World Bank—as well as most other donors—has missed this opportunity for sustaining development and alleviating poverty.

UA is an Important Social, Economic, and Environmental Management Activity

UA refers to food and fuel grown within a city or peri-urban area, produced directly for the market or for home consumption, and frequently marketed by the farmers themselves or their close associates. Urban agricultural activities include horticulture, aquaculture, livestock production, and forestry and often are carried out by low-income farmers, a substantial portion of which are women. Throughout SSA, there is extensive UA occupying increasing amounts of land. For example, in Mozambique one-third of Maputo’s land area is cultivated, and 80 percent of the green space in Beira is reported to be cultivated. In many SSA cities, UA has produced many benefits, for example:

Food Production. In many large SSA cities, 20 to 40 percent of urban food demand is supplied through UA. In Kampala, about 70 percent of the city’s poultry products are produced by urban farmers. Self-produced food in Lusaka accounts for one-third of total food consumption by the poor.

Fuel Production. Since 1950, the Bandia forest in Senegal has been managed for fuelwood. Similarly, forests near Ouagadougou are producing wood to meet urban energy needs.

Waste Management. In Zimbabwe, municipal wastewater is used to irrigate cattle pastures managed by municipal authorities who make profits from cattle sales. Khartoum is reported to have 20,000 goats thriving on solid waste.

Natural Resource Management. In Dakar, saline tolerant crops grown along coastal flood plains prevent erosion. In Kinshasa, the creation of orchards by low-income communities stabilizes slopes on Mont Ngafulla.
Six Factors Constrain UA in Achieving its Full Potential

Despite the actual and potential benefits of UA, several factors constrain the development of UA in African cities. Some are imposed by the government, the market, and support agencies. Other constraints may be internal to the farming community itself. And most apply primarily to lower-income farmers who rarely receive government support or recognition. The most common constraints to UA are: (1) inadequate institutional/legal frameworks, (2) limited access to agricultural inputs and post-production services, (3) inadequate technical knowledge of urban agricultural practices, (4) organizational constraints, (5) political and socio-cultural biases, and (6) lack of physical security.

The World Bank and other Donors Have Overlooked UA

While UA is occurring in many SSA countries, the World Bank has overlooked this activity as an opportunity to increase income and employment, meet food demands, and maximize the efficiency of urban waste and natural resources management. While numerous factors will determine the extent to which UA can or should be pursued, evidence from several African countries indicate that the World Bank has not taken it into account in its sector work and lending program, even in countries where there already is substantial urban and peri-urban agricultural activity. The few exceptions include the Senegal Country Environmental Sector Report and two World Bank-financed investments, the Lobito-Benguela Urban Environment and Rehabilitation Project (FY92) and the Senegal Water Sector Project (FY95). IFC’s Africa Enterprise Fund also has supported UA through loans to private agribusiness corporations.

A New Approach to UA is Needed

If present growth trends continue, many countries in SSA region may be incapable of feeding their population through their existing agriculture system in the coming years. Many others will be capable, but only at a significant cost to the environment. To address both concerns, a greater focus on UA can help counter these trends. Although additional analysis of the actual benefits of UA may be needed before the World Bank makes large-scale investments in UA, there is scope for the Bank to increase its involvement in UA through:

Integration. The World Bank and other members of the donor community should approach UA through an interdisciplinary perspective covering agricultural, infrastructure (particularly waste management), private sector development. Such an approach, moreover, would require multi-sectoral activities reflecting the nature of the UA.
**Strategy.** The World Bank should ensure that UA is not overlooked in efforts to formulate larger environmental management strategies in urban areas—such as Local Environmental Action Plans (LEAPs)—or integrated coastal zone management plans.

**Partnership.** Partnerships at the local and international levels are needed to increase the efficiency of available financial resources as well as to coordinate donor activities and investments. For example members of the World Bank group (particularly IDA, IFC, and GEF) should work better together in association with other donors.

**Policy Instruments.** World Bank operations should help its borrowers choose locally appropriate policy instruments that would either remove constraints to UA or maximize its potential for promoting food security, income generation, and improved natural resource management.

**A Proposed World Bank Action Plan Will Help Implement the New Approach**

Implementing the new approach will require an action plan that incorporates (1) awareness raising about UA, (2) expanding information and knowledge through economic and sector work, (3) promoting UA through LEAPs and other environmental initiatives, (4) incorporating urban agricultural components into existing investments, and (5) integrating UA into new investments.

**Awareness Raising.** In countries that support UA, the World Bank should discuss with policy makers the possibility of establishing a multi-disciplinary national coordinating group on UA that would identify priority UA needs for cities and major towns and develop capacity to respond to those needs. Such a group also could be responsible for initiating programs intended to raise awareness about the potential benefits of UA as well as the potential hazards and means for mitigating them. Improving UA should also be promoted by the Regional Municipal Development Program (MDP) and through Managing the Environment Locally in Sub-Saharan Africa (MELISSA), a new network being built in Africa.

**Economic and Sector Work.** The World Bank's economic and sector work should routinely address UA, particularly where there is substantial farming in urban and peri-urban areas. This work would cover the urban, environment, infrastructure, and agricultural sectors. When investigating urban agricultural activities, there is a need for more detailed analysis on the wider implications of UA to the economy and affected populations. Among other issues, sector and policy analyses should focus on:

- The benefits of UA to households, especially to women, compared to alternative economic opportunities that might be made available through other initiatives.
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- The actual, including opportunity costs, of the capital, land, and other resources required to facilitate the expansion of agricultural production.

- The ability of urban farmers to compete with rural food producers.

- The current and potential contribution of urban farming to the national food supply.

- The implications of expanding UA for urban planning, poverty, and the environment.

- The most effective approaches to organizing urban farmers and removing other local constraints to help them expand their agricultural activities.

Local Environmental Action Plans and other Environmental Initiatives. Experience in many cities around the world demonstrates that an effective approach to urban environmental management is to formulate a LEAP which involves assessing local environmental conditions (audit) and identifying priority problems as well as locally appropriate policies and investments to address them. To help manage the impacts of rapidly growing cities in SSA, therefore, the World Bank should encourage countries to prepare LEAPs. Through this process, planners can assess the nature and extent of UA, the potential for integrating UA into urban waste management and/or land management strategies, and any existing constraints to this activity.

At the national level, most SSA countries have prepared national environmental strategies and action plans. And many of these plans currently are being implemented and revised. In the course of revising these plans, or where countries are just beginning their NEAP process or preparing national sustainable development plans, participants in the process should consider opportunities for improving natural resource management through UA. Similarly, World Bank Country Environmental Strategy Papers should not overlook the potential contribution of UA to sustainable development.

Integrating UA into New Investments

The form that UA takes and the scope for its development in any one urban area varies greatly, depending on, among other things: the accessibility of agricultural inputs, rules governing the use of open land and water, prevailing economic circumstances and colonial traditions, available credit, knowledge and capabilities of potential farmers, and local attitudes towards toward UA. To pursue investment in UA in Sub-Sahara Africa, therefore, the Bank should maximize its chances of success by identifying the countries with the most potential for intensifying its urban agricultural activities - that is, countries that have experienced good performance in UA and have relative political and economic stability (for example, Ghana, Mali, Uganda, and Zambia). The World Bank Group should increase its involvement in UA through the following types of projects:
• **Urban Development Projects.** Urban or municipal development projects can finance capacity building to allow urban institutions to improve land administration, clarification of land tenure, land registration, and urban planning to make land use efficient and ensure appropriate land regulation. The latter should not place excessive restrictions on urban agricultural activities or artificially constrain the urban land market through agricultural zoning.

• **Urban Environmental Projects.** These projects can make fertilizers and soil conditioners more accessible to urban farmers by supporting municipal solid waste management projects or components that include financing for composting facilities. If accompanied by sufficient capacity in compost facility management, local institutions or the private sector could supply urban waste for safe application to urban agricultural land. Institutional strengthening components in environmental management projects can support capacity building for monitoring the effects of applying waste products to crops. They also can support the development of integrated planning approaches and information systems on UA, possibly as a geographic information system (GIS).

• **Infrastructure Projects.** Water supply and sanitation projects can remove constraints relating to insufficient water resources for agriculture. These investments can should take into account the various water needs of urban farms that use water for irrigation or watering livestock. In supporting water supply and sanitation improvements, projects should take into account the acceptability of less than potable quality water for these agricultural purposes.

• **Agricultural Projects.** To help overcome insufficient capital for expanding UA, agricultural projects can provide credit to support improvements in agricultural production, transformation, and marketing for products grown in urban or peri-urban areas. Agricultural extension projects can extend training and other services to urban farmers. The training could be provided on topics such as: methods of composting and marketing of compost for agriculture, small-scale food processing; integrated pest management; using recycled waste water in UA (or mitigating any negative effects); and household water conservation. Pilot UA projects should be initiated to test new approaches and obtain the benefits of UA as soon as possible.

• **IFC Investment in the Private Sector.**
Conclusion

UA presents an opportunity for achieving sustainable development in SSA cities. In supporting urban agricultural activities, the World Bank should identify countries with the maximum potential for expanding UA and then support the necessary actions to help those countries realize this potential. Where urban areas are rapidly expanding, and the poor are experiencing its most severe environmental effects, the World Bank should consider every opportunity for helping low-income populations improve their quality of life. While UA cannot solve the economic problems of SSA, it is one means by which the Bank can help alleviate poverty.
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(Horticulture and Livestock)
1. Introduction

Urban agriculture (UA) can play an important role in sustaining Sub-Saharan African (SSA) cities. Ranging from informal garden plots to large agribusiness corporations, UA can be an important source of food, fuel, and income. It also can promote natural resource conservation, and in some cases, better living conditions for urban populations, particularly the poor. Most SSA countries and the World Bank, however, often overlook the advantages of UA to sustainable development and poverty alleviation. In many cases, moreover, countries make deliberate attempts to curtail this activity.

The purpose of this paper is to examine how urban agricultural activities can contribute to sustainable development in SSA and how the World Bank can expand its involvement in UA in the future. The remainder of chapter 1 defines UA, discusses the nature and extent of UA worldwide, and summarizes UA's role in sustainable development. Subsequent chapters examines urbanization trends in SSA and the nature and extent of urban agricultural activities in SSA (chapter 2), key factors that constrain UA in Africa's urban and peri-urban areas (chapter 3), how the World Bank has addressed UA (chapter 4), and the various means by which the World Bank can promote or support UA as part of its Post-UNCED Strategy for Sub-Sahara Africa (chapter 5).

Definition of Urban Agriculture

Although there is no consensus on a definition of UA, it generally refers to food and fuel grown within a city or peri-urban area, produced directly for the market and/or household use. When marketed, UA products frequently are marketed by the farmers themselves or their close associates. As practiced around the world, urban agricultural activities include:

- **Horticulture**: vegetables, fruit, and ornamental crops grown on roof tops, in backyards, in vacant lots of industrial estates, along canals, on the grounds of institutions, on road-sides, in small and medium-sized farms, in containers, or in hydroponic solutions.

- **Aquaculture**: cultivation of fish, shellfish, vegetables, or other natural produce in tanks, ponds, rivers, and coastal bays.

- **Livestock Production**: raising animals in backyards, on verandas, on roadsides, within utility rights of way, in poultry sheds, and dairy farms.
• Forestry: managing fuel and timber producing woodlots, vineyards, orchards, berry patches, and street and backyard trees.

UA encompasses both formal and informal enterprises. The formal urban farming industry includes market gardens; middle-income enterprises (for example, ornamental plants, poultry, dairy farms), and large agri-businesses (for example, shrimp farming, fruit export, canned vegetables). Informal urban farming, by contrast, is dominated by low-income farmers (over 50 percent of which are women) operating at a small-scale within walking or bicycle distance of their homes or workplace.

Urban farming involves technologies such as shallow-bed gardening—that is, with beds made of non-soil organic matter; soil-less farming or hydroponics (growing plants in water solutions), aeroponics; container farming; and bio-intensive gardening. In contrast to rural agricultural products, urban agricultural produce is more likely to contain perishables (fruits and vegetables), meat products, and high-value crops. The competitive advantage of urban farmers comes from their closeness to the market, which reduces transportation and storage costs, allows fresher products to be marketed, and allows farmers to closely monitor the market and respond quickly to market demand.

Location of Urban Agriculture

UA encompasses various types of farming systems that have widely different demands for urban space. For example, soil-less horticulture and small livestock raising are compatible with neighborhoods that are completely built-up. The spaces urban farmers cultivate differ among cities, but are most likely to be small plots in low-density, often illegal or informal, settlements. In most cases, urban farming is located where the land is either not suitable for building or is awaiting development, rather than land that is particularly suitable for farming. In general:

• The core(s) and corridors within cities, where land is at a premium, typically have farming in the form of intensive technologies such as hydroponic vegetables, shallow-bed farms on rooftops, container gardens, and small livestock in coops. Intensive horticulture is found on temporarily vacant lots in redevelopment sites and on oversized plots.

• The wedges between corridors of high density development typically have market gardens, ornamental plant nurseries, dairies, and poultry farms.

• The fringe is where the more land intensive farming occurs. This includes market gardens, orchards, dairies, livestock, and fuelwood lots. As the city grows and changes, these zones also change, as does the agriculture within them.
Urban Farmers

Urban farmers range from a mother who finds a place on the roadside near her home to start a bean and maize mixed-crop garden to a transnational agri-business firm that establishes a vast shed-grown mushroom farm and an adjacent cannery for world markets. All income groups, except the poorest segment of the population, carry out UA. In most developing countries, however, the majority of urban farmers are low-income ones who farm on land they do not own. The main difference between the farming practices of low and higher income farmers usually is not just one of size, but the farming system and products selected. Lower-income farmers tend to choose the simpler farming systems that require low capital, technology and skills inputs (for example, vegetables, rabbits). The higher the income, the more specialized and high-value may be the crop or the market to which the farmer caters, such as mushrooms, shrimp, or flowers for export. The five principal groups of urban farmers are:

- **Low-Income Farmers.** The majority of urban farmers fall into this category, and often farm on a part-time basis. In many cases, one of the working adults in the family is the principal farmer, and others support the production, processing, and marketing functions. For many urban families, agriculture is the basic source of income throughout the year, and day labor in other industries provides supplementary income on an intermittent basis. Low-income farmers grow food to increase income levels and food security. And UA can complement other sources of income, particularly when these other sources are intermittent, unreliable, and insufficient. Another benefit of UA is that it can make available cash for essential expenditures other than food; over 50 percent of the total family expenditure is for food in many Third World countries. For the very poor, growing their own food may be their only means of survival.

- **Middle and High-Income Farmers.** Middle and high-income farmers, in cities worldwide, run profitable farming enterprises in several farming system, including poultry, ornamental horticulture, high-return vegetables, and others. Nonetheless, a substantial percentage of middle-income farmers farm for home consumption and fungibility benefits rather than for income. Typically, there may be part-time farmers or families where one member is a farmer. Growing food improves the quality and nutritional value of the foodstuffs consumed by the family, and frees income that can now be spent on other consumption needs. A recent survey in Tanzania revealed that, on one agricultural campus, 70 percent of the resident faculty were entrepreneurial urban farmers who found the income an essential supplement to their shrinking salaries (Mvena 1991).

- **Agribusinesses.** Large national and international corporations play a major role in urban agriculture, sometimes dominating a farming system. An international agribusiness giant produced mushrooms in Jakarta. In many large cities, poultry is dominated by
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large operators. For example, in Bangkok, a single large firm has contracts with 10,000 small outgrowers of chickens. It runs the hatcheries and the dressing plants and has a significant market share. Some agricultural corporations contract production to small and medium urban out-growers and handle the marketing and processing functions, utilizing the scale economies within them.

- Farmer Associations and Cooperatives. These can be important actors in UA. Farming associations provide strengths in organization and collective action to farmers. In most cases, farmer cooperatives have the purpose of increasing the sustainability of the farming activity by creating collective ownership or responsibility. They also tend to increase the access of farmers to inputs and to extension support.

- Special Groups of Farmers. A range of urban farmers fall into several groups: women, immigrant farmers, and crisis farmers. In Kenya and other East African countries, for example, three-fifths to two-thirds of urban farmers are women (Rakodi 1988). Indeed, are often the primary farmers and receive some help in planting and harvesting from the rest of the family. By contrast, in countries such as Senegal and Argentina, the majority of urban farmers are men. The more full-time employment in other industries is available and taken by men, the more significant is the role played by women in UA. Even with both adult members of the family employed, women are more likely than men to be engaged in part-time in food production.

Advantages of Urban Agriculture

UA has positive impacts on the economy as a whole for several reasons. First, food production in urban areas has a substantial multiplier effect on the city economy; it generates economic activity in linked industries - that is, input supply (fertilizer, seeds, feed, extension serves), output handling (for example, storage, transportation, canning), marketing, and food processing industries (for example, canned vegetables, poultry products, milk products). In addition, UA is an easy industry to enter. Although some urban farming systems require skilled workers and high capital investment, most urban agricultural activities, including poultry, micro-livestock, vegetables, and ornamental plans can be entered on a small scale with little investment and skills. While productivity and efficiency at this level may be low, the farmer, starting on a part-time basis, may later expand by investing profits back into the business.

Another important advantage of UA is its role in poverty alleviation. Unemployed and partially employed persons, youth, home-bound mothers, and elderly persons can supplement family food and income through small-scale farming. UA, therefore, is an important antidote to urban unemployment because it alleviates urban poverty among those who have migrated to the city but cannot find gainful employment.
At the national level, UA can be planned and managed along with rural agriculture to improve the performance of the food-related sectors of the economy. Most non-staple food imports products can be grown in the city, thus reducing the drain on foreign exchange. In the 1970s, for example, Papua New Guinea was importing 25 percent of the food consumed by the population of Lae. To save foreign exchange, the government began an extension program to promote farming in the city.

In some cases, UA can have advantages over rural agriculture because of its proximity to the urban market and proximity to selling points of inputs. Both conditions are critical where transport infrastructure is inadequate and transport costs are high. Proximity to the market is a natural advantage for producing perishable crops (fruits and vegetables, flowers) and "perishable livestock products (for example, dairy produce, pork, poultry). In addition, fertilizer agro-chemicals and seeds are more often available at markets in urban centers than in the countryside. Consequently, this is where rural farmers obtain them.

Extent of Urban Agriculture Worldwide

Agricultural activities occur in various forms in many urban and peri-urban areas around the world. The percentage of urban families that farm ranges from 25 to 80 percent (table 1), and surveys in different cities have found it satisfying from 25 to 100 percent of the vegetable and protein demand. In cities as diverse as Curitiba, Dakar, Maputo, Rio de Janeiro, and Shanghai, planned farming and forestry in green spaces are undertaken to improve the urban environment and micro-climate; increase the supply of food, fuelwood, and timber; and reduce the risk of natural disasters caused by deforestation and soil erosion. Many upper-income cities (for example, Amsterdam, Berlin, Chicago, Los Angeles, New York, and Stockholm) also include urban farming and forestry in their plans for improving the environment, sustaining development, growing fresher produce, and revitalizing inner cities. Experience in Japan and the Netherlands illustrates its success in industrial counties (box 1).
### TABLE 1: URBAN HOUSEHOLDS ENGAGED IN URBAN AGRICULTURE (HORTICULTURE AND LIVESTOCK)

<table>
<thead>
<tr>
<th>Country</th>
<th>Percentage of Urban Households</th>
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<tbody>
<tr>
<td>Burkina Faso (Oagadougou)</td>
<td>(horticulture)</td>
</tr>
<tr>
<td>Cameroon (Yaounde)</td>
<td></td>
</tr>
<tr>
<td>Congo (Libreville)</td>
<td>(horticulture)</td>
</tr>
<tr>
<td>Fiji (Suva)</td>
<td>(horticulture)</td>
</tr>
<tr>
<td>Kenya</td>
<td></td>
</tr>
<tr>
<td>Mozambique (Maputo)</td>
<td>(livestock)</td>
</tr>
<tr>
<td>Papua New Guinea (Port Moresby)</td>
<td></td>
</tr>
<tr>
<td>Poland</td>
<td></td>
</tr>
<tr>
<td>Russian Federation</td>
<td></td>
</tr>
</tbody>
</table>

Source: Data are from various surveys conducted by numerous agencies during the 1980s and 1990s. Although these data are not necessarily comparable among countries and cities, they provide some indication of the extent of UA in selected countries.

Most urban farmers can be classified as low-income, producing primarily for home consumption (Mazingira 1986). The high percentage of low-income earners among urban farmers suggest that the survival instinct may prompt agricultural activities in the urban and peri-urban areas of many developing countries. Based on interviews with 800 farmers in the fringe areas of Ibadan, for example, about 70 percent of the respondents mentioned various financial reasons as the major impetus for starting a farm in the area. Thirty-two percent stated that they farm to minimize food expenditures, while a further 23 percent claimed that they farm to supplement family income (Gbadegein 1991). In industrial countries, by contrast, the occurrence of farms near cities is due in large part to the farmers' appreciation of the aesthetic and environmental values of the farms, preference for fresh produce, and sometimes a desire to preserve the nation's agricultural resources to meet future demands (Locker et al. 1987).
The difference in how developing and industrial countries view UA is through the evolution of this activity in each country. In Europe, UA has been one stage in development, expanding during the early rapid growth of a city and shrinking as the economy and land values rise. By contrast, UA in the lower-income countries of Asia, Africa, and Latin America does not follow this progression, especially since the 1980s, when urban farming increased and flourished as a competitive economic industry. During that period, for example, Poland experienced a 40 percent increase in UA (Kleer et al. 1988).

Similarly, there has been a doubling of agricultural land in Harare since 1990 (Mougeot 1994), where urban expansion has been more rapid than urban job creation. As urban employment accelerates in SSA, however, UA may well shrink in importance and follow a trend more similar to that of industrial countries.

Role of Urban Agriculture in Sustainable Urban Development

In many countries, evidence shows that urban farming can have a significant role in sustainable urban development by: (1) complementing rural farming in meeting food needs,
(2) recycling a significant portion of urban waste, (3) meeting partial energy and wood demands through managed urban forestry, (4) improving living conditions in urban slums, and (5) improving the management of urban land—that is, increasing the efficiency of land use and reducing the vulnerability of hazard-prone areas.

Meeting Food Needs. To increase food security, millions of poor urban families around the world grow their own food. Surveys in cities around the world reveal that urban farms satisfy between 25 and 100 percent of urban demand for vegetables and protein. In China, for example, urban regions are commonly 90 percent or more self-sufficient in vegetables and 40 percent or more self-reliant in meat, and at least half of the major cities export their produce to surrounding areas. Hong Kong produces 45 percent of the vegetable in 5 to 6 percent of the land area. In North America, between one quarter and three-fifths of the value of all agricultural projects is produced within urban metropolitan areas. In Jakarta, almost one fifth of the food consumed by squatters is self-produced; in Lusaka, it is one third. Poor families in Kenya are growing vegetables, fruit, and livestock to improve the nutritional self-reliance of the poor communities.

Recycling Urban Waste. In most developing countries, the rapid growth of urban areas is accompanied by ever increasing amounts of wastes and other by-products of economic activity. Indeed, one of the principal constraints to the sustainability of cities and towns is the need to find safe means for disposing of these wastes, particularly domestic wastewater and municipal solid waste. When properly managed, UA can safely process and profitably use municipal wastewater and solid waste.

Wastewater. Wastewater reclamation (from residential areas and most commercial areas) and reuse is increasingly recognized as a water resources management and environmental projection strategy, especially in arid and semi-arid countries. The use of reclaimed wastewater for non-potable purposes, such as irrigating in-city landscape as well as peri-urban agriculture and aquaculture, can substitute for existing fresh-water sources. For example, recycling wastewater is particularly important in the drylands of Africa, such as the Sudano-Sahelian Belt. In Israel, Jordan, and Tunisia, similarly, urban wastewater is used for irrigating urban and peri-urban farms (FAO 1992). Shanghai is composting 90 percent of its sewage for sale, mostly in peri-urban areas. In Calcutta, fisheries in sewage lagoons have satisfied one quarter of the city's market demand for fish.

Although irrigation offers the highest level of consumptive use of water and plays a unique role in any scheme of reusing water to dispose of final effluent, an important constraint to wastewater reuse is concern for public health. Pathogens or potentially toxic industrial wastes pose a threat to residents, farmers, and consumers. For example, in Latin America (Peru and Chile) and the Middle East, there have been cholera outbreaks linked to
the irrigation of urban crops with untreated waste water. Special precautions (wastewater treatment and crop restrictions), therefore, should be taken to ensure that these groups are not adversely affected by irrigation reuse.

**Solid Waste.** Using municipal solid waste in urban farming can have the advantages of (a) fertilizing soils, particularly African soils which are degraded due to the lack of organic matter and phosphorous; (b) recycling; and (c) environmental protection because it reduces the amount of polluting chemicals used in farming. For example, where there is adequate municipal solid waste management capacity, including the necessary capabilities to properly manage composting operations, organic waste can be used for fertilizing crops. The level and type of treatment or separation of the waste needed will depend on the composition of the waste. In some cases, it may be feasible to decentralize the waste collection and management facilities that recycle inorganic waste (that is, metal, plastic) and compost the organic waste. Urban solid waste also can be converted into feed for livestock. In Khartoum, approximately 27 percent of all garbage is consumed by goats, sheep, and cattle.

**Meeting Energy Demands and Improving Natural Resources Management.** The management and planned growth of the crop and tree cover in and around cities is critical for sustainable development. For example, in meeting energy demands, urban production of fuelwood (for example, eucalyptus) can substitute for other imported sources of energy, or for fuelwood grown at greater distances. It also may help to reduce expansion into rain forests and other fragile ecosystems or help improve urban air quality (Smit and Nasr 1992). Urban farming and forestry also can improve city environment and climate by increasing green space, reducing air pollution by absorbing pollutants and noise; reducing dust, and regenerating the soil.

Tree cover (including street trees) creates a cooling effect, and, in arid climates, increases humidity and thus provides energy savings. For example, the Chicago Urban Forest Climate Project, which has been computing the costs and benefits of urban forestry, projects the net present value of investment in 95,000 trees in Chicago to be more than twice the cost (McPherson et al. 1994). In addition, vegetation cover (for example, trees and grasses like vetiver) stabilizes slopes, prevents erosion, and provides water catchment; thus, it reduces the risk of natural disasters caused by deforestation and soil erosion. In both fluvial and coastal plains, crops can be protected from floods by trees and grasses. UA also

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1In response to these public health concerns, WHO (1989) has recommended international guidelines for the safe reuse of wastewater in agriculture. In addition, the UNDP/World Bank Water and Sanitation Program has produced a planning guide (Khouri et al. 1994) that integrates environmental and health concerns with agronomic concerns for the sound management of plants, soil, and water.
can put vacant, under-utilized land, or land unsuitable for alternative built-up uses, into productive use.

Improving Living Conditions in Urban Slums. Low-income settlements offer the worst living environment in the city. They are commonly on land ill-suited to human habitation, and suffer a lack of potable water, waste and sanitation services, and open space. The main environmental issue faced by urban poor is ill-health due to an unsanitary living environment with uncollected human and other waste, air pollution, and natural hazards (Bartone et al. 1994). Rodents, houseflies, and cockroaches are also health hazards, being caused by uncollected waste rotting in the living spaces (World Bank 1991).

UA in low-income areas can help clean up the living space by converting derelict land into clean well-planned green space, and by using urban waste in food production, as in the case of Ajusco, Mexico (box 2).

**BOX 2: PRODUCTIVE ECOLOGICAL SETTLEMENTS IN AJUSCO, MEXICO**

Ajusco is a forested, rocky region in the southwest portion of Mexico City, where squatter settlements were formed along the highway in the 1950s. Because the area is heavily degraded and polluted, the government, land-owners, and the real estate industry have made repeated attempts to evict the squatters from the region. In 1980, the area was zoned by the city government as a "green zone" or an ecological conservation zone. A decision was also made to evict the settlements, restrict development in the area, reforest it to restore ecological balance, reduce pollution in the city, and replenish the ground-water aquifers. To resist eviction, some of the squatter settlements cooperated with the greening efforts in creating ecologically sustainable settlements. The communities organized themselves and implemented programs of tree planting, vegetable gardens, and pollution control. Assistance was provided by biologists from universities and local environmental NGOs. One of these settlements, known as Bosque, proposed an integrated "productive ecological settlement," which included: reforestation, micro-livestock, fisheries, mushroom farming, and horticulture. The settlement planted more than 5,000 trees. An integrated recycling system also was established which would use the waste produced by the settlement in the farming activities (for example, compost and rabbit waste were used for the trees and vegetables). The settlement's attempts at conservation and pollution control convinced the government to adopt the activity as a part of its ecological plan for the area, and allowed the settlements to remain in the zone.

Source: Schteingart (1986)
2. Urban Agriculture in Sub-Saharan Africa

Throughout SSA, farming activities occupy substantial amounts of urban and peri-urban land. About one-third of the land area in Maputo is agricultural (Manshard 1992), and 80 percent of the green space in Beira is reported to be cultivated. The following briefly describes the extent of urbanization in Sub-Saharan Africa, and the various types of urban agricultural activities in SSA.

Urbanization in Sub-Saharan Africa

Urban population is growing faster in SSA than in any other region of the world. Although SSA currently is one of the least urbanized areas of the world — about 45 percent in southern Africa, 35 percent in West Africa, 33 percent in Sahelian countries, and about 20 percent in East Africa (Oucho 1993) — urban growth rates average more than 7 percent per year. In some cities, the growth rate has reached as high as 10 percent. And between 1990 and 2025, SSA’s urban population is expected to more than triple to about 700 million and thus account for more than half of the region’s total population (World Bank 1994). By 2020, about 30 cities in SSA will have more than one million people; many will have over 10 million (World Bank 1989).

The unprecedented urban growth in SSA, due largely to rural migration, has overwhelmed the capacity of African municipalities to provide the necessary infrastructure and services to ensure an adequate quality of life for its population. In the next century, moreover, the demand for agricultural products and fuelwood will increasingly come from urban areas. Rapid population growth of close to 3 percent a year (since 1970) and annual increases in production of staple cereals of less than 2 percent are leaving a food gap that several African nations cannot afford to fill by imports. During the same period, the continent’s arable land per capita has been cut in half from 1.2 acres per person in 1965 to the present amount of 0.6 acres (SOFA 1994).

Nature and Extent of Urban Agriculture in SSA

Urban agricultural activities range from sewage irrigation for cattle forage in modern Johannesburg to shallow-bed trench horticulture in small traditional towns in Ethiopia, dairy cow raising in low-density high-income Oyster Bay area in Dar es Salaam, to mushroom sheds in high-density, low-income neighborhoods in Accra. And the extent of the population that farms is substantial, as indicated in table 1. To various degrees, urban agricultural activities are producing food and energy, recycling urban waste, and putting vacant land to productive use.

Food Production. SSA has been characterized as the most food insecure region in the world. Food aid reached an all time high during the period 1991 to 1992 when it provided a million...
tons of cereal or 36 percent of total cereal imports to the region. World Bank forecasts indicate that, to achieve food security, food production will have to grow at about 4 percent per year, whereas it has grown 2 percent a year during the past 30 years (Virji and Schram 1994). In light of present rates of urbanization, FAO has estimated that the SSA grain gap is likely to be 200 million tons by 2030, which is eight to nine times the current deficit.

As evidenced in the countries that have promoted UA, it is possible for many cities in SSA to satisfy up to 50 percent or more of their food demand through UA (box 3). In countries where the urban food supply is particularly insecure, which includes countries with poor infrastructure (for example, Uganda, Zaire) and countries that suffer disruption of infrastructure and food production due to wars or particularly weak governance (for example, Angola, Somalia, Mozambique, Sudan, Liberia, Rwanda), UA is the means of survival for both the urban and refugee populations. Moreover, in cities such as Dar es Salaam, Kampala, Kinshasa, and Maputo, the occurrence of UA tends to increase during a political or economic crisis when food systems become less reliable. In Dar es Salaam, for example, the percentage of the population engaged in UA rose from 18 percent in the late 1960s (Manshard 1992) to 68 percent in 1991 (Mvena et al. 1991).

One of the issues facing urban farming is the safety of food produced in the polluted urban environment. Food contamination can result from atmospheric lead from vehicles on crops grown along roads, and fish contamination from mercury, E-coli bacteria, and other contaminants found in water. At the same time, urban farming practices can damage the environment through the inappropriate use of chemical insecticides and fertilizers. In Bamako, for example, there is frequent misuse of insecticides (Spore 1991). In Kisangani, fertilizer subsidies have resulted in excessive use of chemical fertilizer (Rigalo 1994). Similarly, soil and ground water can be contaminated by the leaching of waste and nutrients from livestock, poultry, and fish. Nonetheless, solid waste in Sub-Sahara Africa tends not to have large concentrations of heavy metals and is particularly rich in organic matter and phosphate.
In addition to meeting a significant portion of urban demand for food, census and household surveys indicate that UA also accounts for an approximately 10 to 30 percent of the jobs in large SSA cities. For example, 20 percent of the population in Dar es Salaam and 30 percent in Maputo are employed by agriculture. The ratio may be higher for smaller cities. A comparison of household survey data to census data reveals that one job is generated for each 2.5 to 3.5 families engaged in agriculture.

Energy Production. Eighty percent of the African population today uses wood fuel, accounting for about 65 percent of the energy consumed. Over 50 million people already face shortages. Current trends, moreover, indicate a threefold increase in demand for woodfuels by 2020. By the year 2000, the urban population alone will account for 50 to 75 percent of woodfuel demand in most SSA countries (World Bank 1989). In light of these trends, the management and planned growth of the crop and tree cover in and around cities is critical for providing a sustainable source of energy in the region. In several SSA countries, urban fuelwood production is a significant source of energy, for example:

- In Senegal, the Bandia forest in the Dakar-Mbour-Thies triangle has been managed for fuelwood production since 1950.
- In Burkina Faso, natural forests near Ouagadougou have been managed for fuelwood.
- In Mali, there are mixed forests for timber and fuelwood around Bamako; eucalyptus and other plantations in peri-urban Niamey; and neem, rosewood, cailcedra and acacia plantations around N’djamena (Sene 1993).
Building Blocks for Environmentally Sustainable Development in SSA

- In Ethiopia, an African Development Bank-funded project will increase wood production for fuelwood in Addis Ababa.

Waste Management. In SSA, there are very few examples of where UA increases the efficiency of waste management. One example is in Zimbabwe, where sewage water is used to irrigate cattle pastures run by municipal authorities who make profits of millions of dollars through cattle sales (Mbiba 1994). Most African cities, however, are neither providing farmers with access to treated waste, nor are they regulating the use or treatment of waste in farming. The result is that farmers are using solid waste, sometimes with inadequate composting and without awareness of its hazardous contents. In addition, wastewater is being applied to farm plots without adequate treatment. For example, a significant portion of the vegetables consumed in Asmara, Eritrea are irrigated with untreated waste water (UNICEF 1994). Similarly, farmers in a squatter settlement in Lusaka are irrigating their crops with waste water illegally channeled from a neighboring sewage lagoon. In Yaounde, irrigation water for salad plants often contains rubbish and sump oil or sewage (SPORE 1991).

Natural Resource Management. Some urban agricultural activities in SSA countries are intended to improve natural resources management and the micro-climate as well as reduce the vulnerability of hazard prone land. In Dakar, saline tolerant crops grown along coastal flood plains prevent erosion. In the 1970s, the environment department in Kinshasa assisted low-income communities in growing orchards to stabilize eroding slopes. And in the Nairobi River flood plain in Kenya, slum dwellers plant fruit trees to prevent flood damage. In some SSA cities, UA has increased the efficiency of land use. For example, the airport in Douala has vegetable plots under its landing approach. Similarly, the airport at Lagos leases out land to small-scale horticulturists. In Accra, most agricultural activities are located on the excess land of parastatal authorities.
3. Constraints to Urban Agriculture

Notwithstanding the actual and potential benefits of urban farming, several factors constrain the development of UA in African cities. Some are imposed by the government, the market, and support agencies. Other constraints may be internal to the farming community itself. And most apply primarily to lower-income farming which rarely receives government support or recognition. The most common constraints to UA are: (1) inadequate institutional/legal frameworks; (2) limited access to agricultural inputs, including access to land, and post-production services; (3) inadequate technical knowledge of urban agricultural practices; (4) organizational constraints; and (5) political and socio-cultural biases.

Inadequate Institutional/Legal Frameworks

In most SSA countries, UA often is actively discouraged through policies, legislation, and regulations that prohibit or limit these activities in urban areas. These constraints date back to colonial times, when any kind of farming and animal husbandry in urban areas was prohibited in most SSA countries (Sanyal 1985, Rakodi 1988, Freeman 1991). In many cases, moreover, the restrictive laws and policies remain unchanged. In Nairobi, for example, where the government has ordered the cutting down of all crops in the past, authorities still consider tree crops and cash crops as illegal (Freeman 1991).

In addition to legislative restrictions, the lack of UA-related policies and regulations presents an additional constraint. Even in the few countries that actively promote UA (for example, Mozambique, Tanzania, Zambia), it usually is the higher-value and export-oriented farming activities that are supported. And where urban farming is allowed, there may be no coherent policy for its development and use. Most cities, therefore, do not properly manage UA activities to ensure environmental protection and health safety.

Unclear institutional responsibilities impede the development of appropriate policies and other actions that can facilitate UA. In Tanzania, both the Ministry of Agriculture and the Ministry of Lands have major roles in the management of UA, but each institution has its own set of priorities (Schippers and Lewcock 1994). For example, a key concern of the Ministry of Agriculture relates to maximizing agricultural output, while the Ministry of Lands seeks the most productive use of land. Similar differences may exist at the municipal level.

Another institutional constraint is the lack of information upon which to base appropriate policies and other actions. Key information gaps encompass: the extent of urban agricultural output; land areas used for UA; the magnitude of employment and income generated by urban agricultural activities; the environmental impacts associated with various UA activities; and food safety. Decision-makers, as well as extension workers
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and the farmers themselves, also need information about the needs and potentials of urban agricultural activities, particularly household gardening. Lack of UA data also makes it difficult for the banks to judge its credit-worthiness.

The limited involvement of international agencies is another factor constraining UA. International assistance has focused primarily on improving family nutrition through the introduction of certain crops and farming systems, many of which are unsuited to low-income urban families. In fact, some of the better UA assistance programs have actually been funded as rural programs (for example, those supported by IFAD, IDRC, GTZ, and DANIDA) and various forms of aquaculture programs.

Limited Access to Agricultural Inputs and Post-Production Services

One of the most important constraints to UA is the limited availability and poor access to the basic inputs to agricultural production (that is, water, land, seeds, fertilizers) as well as the necessary facilities and services to adequately process and store agricultural products and transport them to available markets. Another key constraint is inadequate access to credit.

Water. The shortage of water is a major constraint to the development of agriculture. In some cities, the water supply system does not recognize the urban farmers living in informal settlements as customers and therefore does not provide them with a sufficient supply of water for adequate irrigation. Most cities also do not facilitate or permit access to surface, ground, and waste water. Although wastewater would be suitable for use for various agricultural purposes, it is not readily available to the urban farmer because sewerage systems are designed to remove wastewater from the city rather than reuse it locally. In most SSA cities, there are no standards and monitoring systems to ensure the quality of the wastewater before application to land crops or use as a growth medium for water crops and fish. Inadequate access to alternative irrigation water compels urban farmers in many countries to use the piped water supply, often illegally.

Land. Access to land is a key determinant of the extent and type of UA that can be carried out. Relevant factors are the amount and quality of available land; these include the availability of services, accessibility, and tenure security. In most countries, however, the main constraint faced by urban farming is the inaccessibility of land rather than its availability. In most countries, where farming is not a recognized urban land use, the inaccessibility of land can be attributed to policy constraints rather than physical ones. In Nairobi, for example, large expanses of open land that were reserved in the city by colonial planners in the 19th century are still unavailable for farming (Maxwell 1992, Freeman 1991). In Port Moresby, a substantial amount of farmable land in the city was not being farmed due to land tenure patterns, rather than an absence of demand for farming space (Vasey 1985). In some cases, zoning laws may prevent the land officially owned by a farmer from
using the land for agricultural production. In other cases, tenancy and lease laws may cause land owners to refuse to lease their land for farming out of fear of losing their property.

Where there are no acceptable leasing arrangements, not only are the land owners foregoing rental income, but the informal, illegal, and thus precarious nature of the activity (eviction is always a possibility) is not conducive to efficient long-term farming. With low tenure security and questionable legality, farmers are not motivated to perform efficient farming practices or care about the long-term land conditions, soil regeneration, or the effects of farming on the environment. The low tenure security also makes the urban farmer a high-risk borrower for credit agencies.

Lastly, misconceptions about the availability of land for farming and the economic competitiveness of this activity poses further constraints to UA. In most cities, urban farming occurs in the excess spaces between public and private establishments, in vacant or green-use community spaces, along rights-of-way, and in ecologically fragile areas. In these cases, urban farming does not compete with built uses and in fact provides a second rent to the owner. Intensive farming also can be a competitive use of urban land. Market gardens, poultry farms, orchards, and dairy farms in the city are profit-making enterprises that can pay competitive rents.

Seeds, Pesticides, and Equipment. In many cities, essential farming inputs such as seeds, pesticides, equipment, and animal feed and medicine are not readily available. The markets and sales channels for these inputs are either not developed and organized, or are oriented towards the rural farmer. The inputs that are available to the smaller farmer are of uncertain quality and often in an uncertain supply. For example, available seeds may not produce high yields. In addition, equipment and tools are usually designed for rural agriculture and are seldom well suited to urban needs, which involve smaller fields and more intensive production. Another key constraint to UA is the limited supply of fertilizer. And for organic wastes to be used more widely in urban farming, various obstacles will have to be surmounted, for example:

- Much of the existing agriculture in urban areas is small-scale and dispersed throughout the city. The solid waste originating in households and businesses, however, usually is collected as part of a large collection system and transported to major dump sites within or outside the city. This process is not conducive to using solid waste in agriculture or regenerating the natural resources of the city.

- Most solid waste management systems do not separate organic and inorganic wastes from the toxic and non-toxic wastes. Unless the waste management system can ensure that toxic materials do not enter the municipal solid waste stream, solid waste compost cannot be used as a soil conditioner.
Many solid wastes are disposed of through waste water systems and are usable for farming only if the sewage is properly treated and the sludge composted.

Credit. Farming activity in urban areas, which often is not recognized as a valid economic activity, does not receive credit easily. The lack of recognition, tenure insecurity, and lack of organized markets make urban farming a high-risk activity for loan agencies to consider. Although most countries have special facilities for rural farmers, there are usually no government programs reserving or funneling credit towards urban farmers. With the exception of the IFC, most banks do not list urban farmers among their target customers.

Urban farmers, producing in response to market demand cycles, need working capital to manage the production cycle. The absence of credit for this capital reduces the capacity of the farmers to absorb business shocks and weather the difficult periods, resulting in high failure rates. It can also result in low yields from the farming activity because the farmer does not have the working capital to plan and purchase necessary inputs. Farming activity, therefore, may be intermittent, that is, occurring whenever sufficient capital and inputs are available. Lack of capital also prevents poor farmers from upgrading farming technology or investing in higher-yield farming systems, such as poultry, fisheries, livestock, or ornamental horticulture.

Many cities have non-governmental organizations (NGOs) that help increase access to credit for entrepreneurs in the informal sector. They may act as intermediaries between the entrepreneurs and the banking system and organize the former to spread risk and ensure collective management and responsibility. Nonetheless, these and other types of credit supply systems often fail to include the low-income urban farmer. Similarly, micro-lending programs usually have not considered urban farming as a lending sector, although they may lend to urban farmers as entrepreneurs.

Post-Production Facilities. In many instances, urban farmers may have sufficient production capacity, but may lack the necessary facilities to process and then market the products effectively, either directly to the consumer or to the agri-business processing industry. For example, many products benefit from quick or early processing and packaging, such as easily damaged fruit and fish. The need, therefore, is for freezing plants, cold storage facilities, purpose-designed packaging, and canneries. In most countries, however, available processing, storage, and packaging for agricultural products are oriented to rural agriculture.

Urban food markets in most countries are designed, often since colonial times, to import food from rural areas. Input-producing agribusinesses, therefore, are geared to serving rural agriculture, and the input and output market systems and infrastructure favor rural agriculture. The market structure may be composed of large wholesalers purchasing directly from rural areas or from intermediate, wholesale markets at the edge of the city and
supplying retail outlets throughout the city. Wholesale merchants may be unwilling to deal with small producers.

Although larger urban farmers usually have the resources to sell their products through such a market structure and are likely to be large enough to sell to wholesalers, small-scale urban farmers do not. The small- and medium-scale farmers either need a locally-based market venue where they can sell their produce themselves or they need a middleman or agency to sell their produce to retail outlets. Similarly, the agricultural storage and distribution systems deal in large quantities and are organized to serve rural agriculture. The distribution and storage are usually in the hands of large operators who transport products from rural areas to wholesale markets (where retailers get their supply) or to large supermarkets.

Inadequate Knowledge and Technical Support

UA deals with economic and environmental factors which are different from those in the countryside. Land and water resources are scarce and more expensive. The environmental impacts of farming are even more important in the city due to the high concentration of the population. Urban farming, therefore, has to be intensive and more resource efficient. Because the technology needs of the urban farmer are different from the rural farmer, many rural farming techniques are not easily transferred to the city. It is not surprising, therefore, that the agricultural research, transfer, and extension agencies that serve the rural farmer do not usually include the urban farmer. Further, the differing needs of urban farming are rarely recognized; UA, therefore, does not receive sufficient investment in research on relevant farming techniques, or in the adaptation of existing techniques to the urban area.

Very few extension services apply to urban farmers, and even less training is designed specifically for them. Those training programs that do address UA, however, tend to focus on specific, mostly upper-income, farming systems such as hydroponics, poultry, and horticulture, and they tended to be technical rather than cover all aspects of a successful urban farming enterprise (for example, marketing, investment management, processing).

In Kenya, a survey found that low-income livestock farmers lost more cattle than they sold on the market. Veterinary services, however, were found to go to higher-income cattle raisers for two reasons: they paid extension agents a bonus for service, and their farms were more accessible than those of urban farmers (Mazingira 1986). Similarly, extension services in Kampala are more available to the wealthier farmers. Forty percent of the high-income farmers received visits from government extension workers as compared to five percent of the low-income farmers (Maxwell 1992).
Organizational Constraints

Due to the lack of a strong internal organization and identity, particularly in the case of low-income farmers, UA often fails to be recognized as a legitimate activity. In addition, the varied urban agricultural activities are not seen as a single industry even though the factors of production and the input and output markets share several common features. One of the causes for this lack of recognition is the fragmentation and physical dispersal of farmers, and the turnover among those who farm. The illegal or informal nature of urban farming also reduces the likelihood of organization. Moreover, low-income farmers frequently lack the means or information to organize themselves without outside help. The tendency of farmers, particularly in Africa, therefore, is to restrict their interactions to within their ethnic group or community. While this increases their cohesion, it reduces mutually beneficial interactions with other farmers. Farmers in various countries are aware of this lack of organization, sometimes seeing it as the most important obstacle to further development of their activity.2

Political and Socio-Cultural Biases

Political and socio-cultural biases are a major constraint to UA. Some of these biases arise from outdated notions of what constitutes a city; others have a socio-cultural origin. For example, in SSA countries with a colonial history, a key factor perpetuating the biases against UA is the colonial concept of the city which remains embedded in the minds of many decision-makers. The European concept of the city was of a planned, "civilized" space where the modern, industrial revolution took root, and there was space in the city only for recreational gardens, forests, and neat lawn patches, and none for growing food except in "recreational" gardens. Today, most planners, economists, and bankers view UA as a marginal informal sector activity inappropriate for the urban economy or landscape. Consequently, it does not get official support or sufficient private financing. And these biases diffuse to the general population, often resulting in the perception of farming as an undesirable activity. They also extend to market and credit agents, resulting in a lack of confidence in the industry. As demonstrated in Lusaka (box 4), these biases can infiltrate policy and legislation.

2 In contrast to small-scale urban farming enterprises, urban farming systems that are high-return and practiced by upper-income farmers, such as poultry and floriculture, are typically more organized. Input and output markets are well developed, the government recognizes these farming systems as agribusiness industries for which credit is more readily available. In addition, there are some associations of urban farmers (Brownrigg 1985. Streiffeler 1991). A successful farmer organization is the one in Kinshasa with 6,000 members (SPORE 1991). In addition, the Syndicates of market gardeners "maraichers" in Senegal, Mali, Burkina Faso, Niger and Cote d'Ivoire originated in the 1940s and 1950s and continue to be effective.
**BOX 4: GOVERNMENT POLICY AND THE DEVELOPMENT OF URBAN FARMING: URBAN AGRICULTURE IN LUSAKA, ZAMBIA**

For decades, the Lusaka City authorities adopted negative attitudes and policies against urban farming. Cultivation within the vast open spaces of the "garden city" of Lusaka began with the influx of migrants after independence in 1963. The City Council was "embarrassed" by the "unmodern" appearance of crops in the city. Crop production in the city was considered a health hazard and laws making farming of vacant land illegal were enforced. Legal proceedings were rarely taken up against farmers, but slaughtering of crops on public land by the authorities was common.

With a worsening economy in the late 1970s, the urban poor felt an increased need to produce their own food. The state faced increased delegitimization with its inability to improve the economic conditions. Official policy changed with the President making a speech in 1977, urging urban residents to grow their own food, in part so that rural crops could be exported to neighboring countries to increase foreign earnings.

The Lusaka City Council stopped enforcing laws against farming. Subsidized seeds for fruits and vegetables were made available through government-run stores. Programs promoting urban farming in low-income communities were started through co-operation between the Lusaka City Council, the National Government, American Friends Service Committee, and UNICEF.

**Sources:** Urban Resource Systems (1984), Sanyal (1985)

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Lack of government recognition affects UA in many ways. For example, there is no data collection, no identity and validation as an industry, and no recognition of UA as a productive sector of the economy. Consequently, the activity appears as a high risk to credit agencies, research and development agencies, and market agents. Moreover, the absence of data raises doubts about its benefits. The agriculture and food policies of the country, therefore, do not include UA as a supply source which limits its benefits to the country. Similarly, the health, nutrition, and environmental policies of a government do not incorporate urban farming and therefore make limited use of its potential. The lack of an official recognition of UA's role in the urban economy leads to insecurity among farmers, and consequently a limit to their commitment to and investment in farming. Where urban farming is illegal, moreover, farmers often may face harassment from government authorities and land-owners.
Another reason for the bias against using UA is the negative view of using household and other wastes for soil enrichment. While urban waste is considered dirty and unhygienic, cities are viewed by planners as spaces that should be neat and clean with the function of the sanitation system to get the waste out of the city and out of sight. In some cities, however, attitudes towards urban farming have changed when the economically and politically influential sections of some cities became involved in UA. In Dar es Salaam, for example, attitudes towards livestock in the city changed considerably when the richer residents of Oyster Bay started to rear cows in their backyards.

In many other cities social biases still limit the growth of UA industry. The opposition to urban farming has in many places caused it to be treated as an "outcast" industry, similar to tanning leather in a Hindu society or gambling in a Muslim society. This lowers the social position of the urban farmers. In these situations, immigrants or a long-established group tend to dominate either all of UA or certain farming systems within it, and the industry stagnates and remains marginal to the society and often the economy as well. In some countries, where there is a social stigma attached to farming, farmers may prefer to move to other occupations whenever feasible.

Finally, gender biases apply to UA. A large portion of the farming for home and neighborhood consumption is done by women, but this activity is not normally taken into account in the official food or economic statistics. It rarely receives recognition from the family as a valuable economic activity even though it feeds the family and frees up income for other expenditures. In addition, women have unequal access to markets, inputs, land, and credit compared to male farmers -- and they are not eligible for land ownership in many cultures. In some situations, this extends to leasing land which is vital to UA.

Lack of Security

Unlike the products of most other industries, those of UA are usually left out in the open where, relative to rural areas, there is a large number of passers-by, all of whom have some demand for the products, whether food or fuel. Consequently, they are particularly vulnerable to theft. Indeed, numerous surveys reveal that urban farmers regard the loss of crops through theft and lack of police protection as one of their most common problems. This problem, however, exists mostly for those who farm on unguarded open land or on an illegal or informal basis, where the risk of theft is even higher. If the farming activity is illegal or considered economically insignificant, recourse to police action may not be available. By contrast, upper-income and corporate farmers are more likely to farm inside closed yards and in the safer, fringe areas of the city. Finally, the absence of an insurance system makes urban farming ventures risky in the face of disasters, whether natural or caused by humans. Unlike rural farmers, who may receive compensation or government assistance in the event of a catastrophe, unrecognized urban agriculturists do not receive such assistance.
4. World Bank Involvement in Urban Agriculture

UA is a multi-disciplinary activity that crosses the boundaries of several sectors -- urban environment, infrastructure, and agriculture -- as well as cross-cutting issues such as poverty alleviation, sustainable development, women's roles in development, and small business development. Nonetheless, the World Bank, as well as other donors, has virtually ignored this activity as an investment opportunity largely because there has been a lack of expressed demand from governments, and the World Bank generally separates urban and rural issues. Although numerous factors determine the extent to which UA can or should be pursued, evidence from several African countries indicate that even in countries where there is substantial urban and peri-urban agricultural activity, the World Bank has not taken it into account in its economic and sector work as well as its lending program. By contrast, the International Finance Corporation (IFC) has made several loans to small urban agricultural enterprises.

Sector Work

The Bank's economic and sector work in SSA has not routinely addressed UA. In the few cases when it was addressed, however, UA received very little attention as in the case of Cote d'Ivoire and Senegal.

Cote d'Ivoire. The Urban Sector Strategy includes the urban environment among the four key urban strategy issues; the other issues are urban poverty, land management, and decentralization. The document identifies priority urban environmental problems and addresses them in the sections on the key elements of the strategy (policy reform, finance mechanisms, governance and participation measures, and institutional development and capacity building) and key reform elements (appropriate infrastructure and improving urban environmental quality, formal/informal sector interface, land management, and decentralization). Among other issues, the strategy addresses the urban/rural interface, including: urban and rural poverty, poverty/environment nexus, rural migration to urban areas, and negative effects of peri-urban agricultural practices. While this strategy is addressing the need to mitigate the negative impact of UA, which ultimately would contribute to its acceptance, it does not focus sufficient attention to encouraging UA in appropriate locations.

Senegal. The Senegal Country Environmental Sector Paper (CESP) focuses on Senegal's growing urbanization and associated environmental problems as one of six key environmental issues confronting the country (the others are resource endowment, population, use of land and natural resources, environmental management processes, and government policy and programs). Specific urban environmental issues are discussed under three main themes: (i) urban planning (illegal settlements, congestion, and unbalanced distribution of business, educational establishment, and services); (ii) urban
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wastes (sewage, waste water, garbage); and (iii) urban consumption of environmental resources (food, fuel, and water). Recognizing the increasingly important economic role of urban areas, the CESP includes several recommendations in addressing urban environmental issues. Among them, the paper recommends reusing urban sewage (after treatment) for farming.

Lending

Most World Bank-financed projects which are relevant to urban farmers in SSA do not address UA. For example, agricultural extension projects do not extend support to agricultural enterprises occurring within urban, or even peri-urban areas. Similarly, a review of 71 urban development and infrastructure projects approved during the period FY74-88 (Bartone, Bernstein, Wright 1990) revealed that only one project in SSA addressed UA. Energy projects also do not consider UA as an investment opportunity. In addition, most urban environmental projects fail to take into account both the problems and opportunities inherent in urban or peri-urban agriculture. It is only in isolated cases that urban environmental projects have addressed these activities to any extent.

The first World Bank investment that may have had a positive impact on UA occurred in Lusaka in the late 1970s. Although this investment has been successfully implemented, its objectives were set so low that their achievement has not been impressive. Nonetheless, in 1994, 80 percent of the single family households located within the World Bank project area are engaged in urban farming.

The implementation of an urban infrastructure project in Madagascar was not as successful. Approved in FY80, the Antananarivo Water and Sanitation Project included a solid waste component that supported the improvement of an existing composting facility so as to produce 10,000 ton per year of good quality compost for use by farmers in the surrounding area. Upon implementing this component, however, it was determined that the existing facility would have to be replaced, rather than improved. When the new plant was finally built, it became clear that the responsible government agency did not have adequate capacity to manage the composting operation. The compost was stored on vacant land on the plant premises and farmers from the surrounding community could take the compost free of charge if they were able to get to the plant and haul the compost away. In many cases, however, farmers did not have the necessary transport to pick up the compost. Moreover, the local government had no provisions for adequate quality control, marketing, sales, and delivery (Bartone, Bernstein, Wright 1990).

More recently, the Lobito-Benguela Urban Environmental Rehabilitation Project included an UA component. The objectives of this project are to: (1) improve the effectiveness of the existing Dakar sewerage system, (2) develop sanitation in secondary towns, and (3) promote the reuse of treated municipal wastewater for irrigation.
Accordingly, the project's urban sanitation component finances small-scale municipal wastewater treatment plants for the reuse of municipal waste waters in peri-urban areas.

In addition to the very limited World Bank financing of UA-related investments, the International Finance Corporation (IFC) has supported numerous urban agricultural activities in SSA countries. Among its various loan programs, the Africa Enterprise Fund (AEF) Program, which makes loans of US$250 thousand to US$5 million to the private sector, has supported numerous urban agricultural activities. For example, this program has made corporate loans to help finance the expansion of various agricultural enterprises such as pineapple growing in Benin, green bean production in Cameroon, edible oil mills in Dar es Salaam, and fish processing in Entebbe. Among other investments, these funds have provided the necessary financing for purchasing tractors, land, fertilizer, and other agricultural inputs.
5. Recommendations for World Bank Involvement in Urban Agriculture in Sub-Sahara Africa

If present growth trends continue, many countries in SSA region may be incapable of feeding their population through their existing agriculture system in the coming years. Many others will be capable, but only at a significant cost to the environment. To address both concerns, UA can contribute to achieving an environmentally sustainable future for SSA. UA can complement rural farming in the national food system in satisfying some of the food demand, and remove some of the environmental stress resulting from the extension and intensification of rural farming. UA also presents a means to generate income and alleviate the conditions of urban poverty.

New Approach to UA

Although the potential for promoting food production in an African city will vary according to economic and environmental factors, evidence from many SSA cities indicates that it is possible for some cities to satisfy up to 50 percent or more of their food demand through urban farming. Although additional analysis of the actual benefits of UA may be needed before the World Bank makes large-scale investments in UA, there is scope for the Bank to increase its involvement in UA through:

Integration. The World Bank and other members of the donor community should approach UA through an interdisciplinary perspective, covering agricultural, infrastructure (particularly waste management), and private sector development. Such an approach, moreover, would take into account the multi-sectoral nature of UA.

Strategy. The World Bank can ensure that UA is not overlooked in the efforts of some SSA cities to formulate local environmental action plans (LEAPs) or the activities of national or sub-national governmental authorities in preparing integrated coastal zone management plans.

Partnership. Partnerships at the local and international levels are needed to increase the efficiency of available financial resources as well as to coordinate donor activities and investments. For example members of the World Bank group (particularly IDA, IFC, and GEF) should work better together in association with other donors, some of which already have been investing in UA (for example, African Development Bank, IDRC, GTZ, UNDP, UNCHS, Danida, UK/ODA, NE/DGIS).

Policy Instruments. World Bank operations should help its borrowers choose locally appropriate policy instruments that will either remove constraints to UA or maximize its potential for promoting food security, income generation, and improved natural resource management. In choosing instruments, moreover, it should be clear that removing
constraints to UA should be consistent with land market conditions and not create distortions. For example, restricting large amounts of land for agricultural use is not desirable. This would only serve to limit the amount of available land for development, and therefore increase its costs (Bernstein 1994).

**Proposed World Bank Action Plan**

Implementing the new approach to UA will require an action plan that incorporates (1) awareness raising about UA; (2) expanding information and knowledge through economic and sector work; (3) promoting UA through local environmental actions plans (LEAPs) and other environmental initiatives; (4) incorporating urban agricultural components into existing investments; and (5) integrating UA into new IBRD/IDA investments.

*Awareness Raising.* In countries that support UA, the World Bank should discuss with policy makers the possibility of establishing a multi-disciplinary national coordinating group on UA that would identify priority UA needs for cities and major towns and develop capacity to respond to those needs. Such a group also could be responsible for initiating programs intended to raise awareness about the potential benefits of UA as well as the potential hazards and means for mitigating them.

*Economic and Sector Work.* As part of urban, environmental, infrastructure, and agricultural sector work, the World Bank should routinely address UA where there is substantial farming in urban and peri-urban areas. As part of these activities and related policy and research work, there is a need for more detailed analysis on the wider implications of UA to the economy and affected populations. Among other issues, it will be necessary to analyze:

- The benefits of UA to households, especially to women, compared to alternative economic opportunities that might be made available through other initiatives
- The actual, including opportunity costs, of the capital, land, and other resources required to facilitate the expansion of agricultural production
- The ability of urban farmers to compete with rural food producers
- The current and potential contribution of urban farming to the national food supply
- The implications of expanding UA for urban planning, poverty, and the environment
Successful approaches to organizing urban farmers and removing other local constraints to help them expand their agricultural activities.

In addition to sector work that addresses UA directly, the World Bank should also undertake investigations of the potential impacts of recycling urban waste on UA. For example, a recent study analyzed the effects of using contaminated water in irrigation in Santiago (box 5).

**Strategy Work.** Experience in many cities around the world demonstrates that an effective approach to urban environmental management is to formulate local environmental action plans (LEAPs). Formulating such a strategy involves assessing local environmental conditions through an auditing process, identifying priority problems, and selecting locally appropriate policies and investments to address those problems. Public participation and networking in the process can ensure ownership, commitment, and long-term success in implementing the strategy. Through the environmental audit process, the first step in formulating an environmental strategy, participants in the planning process can assess the nature and extent of UA, its potential for increasing the efficiency of waste management and land use, and any existing constraints to expanding urban agricultural activities. Where conditions are appropriate, participants in the planning process may be able to integrate UA concerns into urban waste and land management strategies.

At the national level, most SSA countries already have prepared national environmental strategies and action plans. And many of these plans currently are being

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3See Bartone et al. (1994)

4See Leitmann (1995) on managing the environment locally in Sub-Saharan Africa (MELISSA).
implemented and revised. In the course of revising these strategies and plans, as well as national sustainable development plans, participants in the planning process should look for opportunities to maximize the natural resource management aspects of UA as well as its potential for generating income, increasing food security, and thus contributing to sustainable development.

*Lending Program.* The form that UA takes and the scope for its expansion in an urban or peri-urban area varies greatly, depending on, among other things: accessibility of land, water, labor, and other agricultural inputs; the formal and informal rules governing the use of open land and water; prevailing economic circumstances; colonial traditions; available credit; farmers' knowledge of how to profitably engage in agricultural activities; availability of infrastructure; and local attitudes. To pursue investment in UA, therefore, the most effective approach is to identify SSA countries with the highest potential for success in UA— that is, cities that have experienced good performance in UA and have a relatively general political and economic stability (for example, Ghana, Mali, Uganda, and Zambia) — and then address the key constraints to these activities (for example, insecure tenure, inadequate supply of essential inputs). These constraints can be addressed in the following types of projects.

**Urban and Municipal Development Projects.** Urban development projects can be used to address many of the factors constraining UA. For example, municipal development projects that finance improvements in urban institutions can support institutional capacity building that can improve land administration, clarification of land tenure, land registration, and urban planning. Building capacity in these areas can help to maximize the efficiency of land use and ensure locally appropriate land regulation that does not place excessive restrictions on urban agricultural activities or artificially constrain the urban land market (for example, through agricultural zoning).

**Urban Environmental Projects.** Urban environmental projects can help make fertilizers and soil conditioners more accessible to urban farmers by supporting municipal waste management projects or components that include financing for composting facilities. If accompanied by sufficient capacity in compost facility management, local institutions or the private sector could supply urban waste for safe application to urban agricultural land. Pollution control projects that finance measures to control air pollution can remove the risks of crops contaminated by air pollution. Institutional strengthening components in environmental management projects can support capacity building for monitoring the effects of applying waste products to crops. They also can support the development of information systems on UA, possibly in the form of geographic information systems (GIS).

**Infrastructure Projects.** Water supply and sanitation projects can address the need to provide adequate water resources for various urban agricultural activities. For example, preparing water supply and sanitation projects for the Central Asian countries of Kazakhstan and
Uzbekistan, the World Bank, with local assistance, carried out a social assessment that, among other issues, focused on the extent of urban and rural households engaged in UA as well as available water sources and water supply needs. In supporting water supply projects, moreover, project designers should take into account the acceptability of less than potable quality water for certain agricultural purposes. In planning sanitation investments, however, it may not be advisable to support the application of sewage to food crops, particularly where there is inadequate capacity to ensure safe operations and effective environmental monitoring.

**Agricultural Projects.** World Bank-financed agricultural projects can address another set of constraints to UA. For example: to help overcome insufficient capital for expanding UA, World Bank-financed agricultural projects can provide credit to support improvements in agricultural production, transformation, and marketing for products grown in urban or peri-urban areas. Agricultural extension projects can extend training and other services to urban farmers. For example, the training could be provided on topics such as: methods of composting and marketing of compost for agriculture, small-scale food processing (for example, dried or powdered leaves of cassava cucumber, corchorus, amaranth, cowpeas, tomatoes); integrated pest management; using or dealing with problems associated with the use of recycled waste water in UA; and household water conservation. In addition, pilot UA projects should be initiated not only to test new approaches, but to obtain the potential benefits of UA as soon as possible.

**Policy Dialogue.** As part of its lending for UA, the World Bank should discuss with policymakers in the SSA countries the need to support UA to help achieve its potential benefits. For example, the Bank could discuss the possibility of establishing a national coordinating group on UA that would identify priority UA needs for cities and major towns and to develop capacity to respond to those needs. Such a group also could be responsible for initiating programs intended to raise awareness about the potential benefits of UA as well as the potential hazards and means for mitigating them.

**Conclusion**

UA presents an opportunity for achieving sustainable development in SSA cities. In supporting urban agricultural activities, the World Bank should identify countries with the maximum potential for expanding UA and then support the necessary actions to help those countries realize this potential. While investments in urban waste recycling can support UA in some urban areas, and meeting other environmental objectives, they need not accompany investments to increase food security, income generation, and poverty alleviation. Where urban areas are rapidly expanding, and the poor are experiencing its most severe environmental effects, the World Bank should consider every opportunity for helping low-income populations improve their quality of life. While UA cannot solve the economic problems of SSA, it is one means by which the Bank can help to alleviate poverty.
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