Understanding the Links between Agriculture and Health

Urban Agriculture and Health

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2020 VISION FOR FOOD, AGRICULTURE, AND THE ENVIRONMENT

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With half the world's population living in cities and towns, many poor urban dwellers face problems gaining access to adequate supplies of nutritionally balanced food. For many urban populations, an important source of food is urban and peri-urban agriculture (UPA). Production and processing of crops—particularly horticultural crops—and livestock is frequently part of urban and peri-urban livelihood strategies, and the food produced forms a large part of informal sector economic activity. This brief examines the benefits and problems of UPA for the nutrition and health of poor urban and peri-urban populations.

NUTRITIONAL BENEFITS OF UPA

UPA is probably most significant as a livelihood strategy and as a food source in Sub-Saharan Africa. In the cities and towns in East Africa where data are available, on average around a third of urban dwellers are engaged in agriculture, whereas in West Africa, reported figures vary from more than 50 percent in Dakar, Senegal, to 14 percent in Accra, Ghana. As much as 90 percent of leafy vegetables and 60 percent of milk sold in Dar es Salaam, Tanzania, is produced in and around the city. Similarly high levels of urban and peri-urban milk production are cited for Nairobi, Kenya, and Addis Ababa, Ethiopia.

In Asia the picture is more mixed, with China providing evidence of the highest levels of urban and peri-urban vegetable supply. Seventy-six percent of the vegetables supplying Shanghai is produced within 10 kilometers of the point of sale, and in Beijing, the figure is estimated at 85 percent, with 79 percent of fruits coming from peri-urban areas. Intensive vegetable and fruit production is also a widespread livelihood option for urban populations, estimated at 31 percent in urban Beijing and 64 percent in the peri-urban areas. In lowland Southeast Asia, where most of the large metropolises are located, UPA is a smaller supplier of food or source of livelihoods. In Metro Manila about 6 percent of land is allocated for agricultural use, including 2 percent for fishponds; fish production by local people involved in aquaculture and off-shore fishing meets two-thirds of fish demand.

In Latin America, the special conditions created by the U.S. blockade of Cuba led to a massive increase in urban agriculture in Havana and other cities. Currently, agriculture covers about 12 percent of the city area, provides work for 117,000 people, and is the major supplier of vegetables to Havana. Research in Lima, Peru, indicates that between 15 and 20 percent of households are engaged in UPA, mostly landless families raising poultry and other small animals. The three irrigated valleys in the city make major contributions to the vegetables consumed—up to 70 percent for some species.

The production of food in urban and peri-urban areas brings nutrition and health benefits to poor producer households. Studies in Kampala and Kigali, Rwanda, have shown positive correlations between food production and improved nutrition, owing to higher and more stable access to food virtually throughout the year. Urban mothers who were farmers gave a higher level of care to children than did mothers in other types of work.

UPA can also offer nutritional benefits to urban consumers. Poor consumers in Yaoundé, Cameroon, depend on indigenous leafy vegetables, produced almost exclusively in the urban inland valleys, for a major part of their micronutrients. Urban agriculture in Havana has had a significant, direct effect on urban nutritional status, providing a per capita supply of between 150 and 300 grams daily of fresh vegetables and herbs.

THE HEALTH CHALLENGE OF UPA

Although UPA helps secure urban livelihoods and combats hunger and poverty, there are widespread concerns that accompanying health hazards may undermine nutritional and social development benefits. The major health hazards associated with urban agriculture and its products are (1) chemical, involving direct or indirect contact with chemicals; (2) physical, such as injury from tools or equipment; (3) biological, involving direct or indirect transmission of harmful organisms; and (4) psycho-social, related to anxiety and stress.

The dilemma surrounding urban waste and agriculture illustrates the opportunities and risks UPA poses for health. Urban wastewater and solid wastes contain high levels of plant nutrients that could improve soil fertility in areas beset by poor soil quality, like Sub-Saharan Africa. Urban producers have in fact used these nutrients since the days of the earliest human settlements. Yet urban areas discharge large amounts of these nutrients haphazardly, creating high health risks, an unpleasant environment, and environmental damage. Animal manure and human excreta are today rarely used effectively as soil nutrients in urban areas of poor countries. Extensive research and development are needed to find low-cost infrastructure and policy solutions that make better use of urban wastes for higher food production.

HEALTH RISK ANALYSIS OF UPA

Clearly a balance must be sought between the health benefits and risks of urban and peri-urban agriculture. One tool for evaluating this balance in development projects is a health-impact assessment (HIA). Through risk analysis, project developers can better ensure that projects are suited to the unique reality of the community, that the health risks and benefits are identified and addressed, and that the project will be evaluated and accountable to stakeholders.

The steps in an HIA are as follows:

1. Identify and prioritize the most important health hazards and benefits for the city and its population through discussion with multiple stakeholders;
2. Examine hazard exposures for particular populations to think through how to reduce and mitigate these health hazards;
3. Identify who benefits most and how from a specific UPA-derived health benefit and how to promote this benefit; and
4. Formalize outputs from steps 2 and 3 into health hazard mitigation strategies or health benefit promotion strategies.

An example of this HIA process comes from Kampala, Uganda, where HIA showed the existence of real risks, but also uncovered different perceptions of risk by different stakeholders. In the complex policy and stakeholder environment of cities, these different perceptions need to be discussed and negotiated to arrive at common responses (see box).

Case Study: The Kampala Study of the Health Impacts of UPA

Between 2001 and 2005, Urban Harvest, a systemwide initiative of the Consultative Group on International Agricultural Research (CGIAR), documented the nature of urban farming in Kampala, Uganda, where half the land is farmed, mainly in the wetlands of Lake Victoria and its channels. The study involved a stakeholder analysis of the benefits and problems of UPA, followed by a scientific health-impact assessment. Key stakeholders included national and city government agencies, research and environmental organizations, and several local nongovernmental organizations (NGOs). The results of the stakeholder and scientific analysis were consistent in some respects but inconsistent in others.

Stakeholders perceived the main benefit of UPA as nutrition and the main problems as bacteriological and toxic contamination of soils and crops, air pollution also affecting crops, and the transmission of disease from livestock to humans (for more on zoonotic diseases, see Briefs 5 and 9). Indeed, earlier studies from the 1990s had shown that urban households involved in food production in Kampala had better nutritional status than other households. In terms of risk, farmers in Kampala believed that poor sanitation and uncontrolled discharges from a variety of urban economic activities were leading to toxicity in crops. The scientific assessment partly bore out this belief: heavy metals like lead, cadmium, and zinc do accumulate in crops, particularly leafy vegetables, growing within 30 meters of main roads. Yet measurements of heavy metals in various urban crops suggested a limited risk from consumption of tubers grown in wetlands. The level of contaminants in fish, a common source of protein near Lake Victoria, requires more investigation, as does the potential risk for children of consuming raw fruit in areas with high levels of emissions from several sources at once (traffic as well as wood smoke).

Bacterial contamination was not found to be transmitted to crops through their roots or to tubers grown in contaminated wetlands. Clear public health and policy guidelines are needed, however, to inform farmers and consumers about how to reduce health risks from contaminated wastewater. The limited level of risk identified under current circumstances would be further reduced if these measures were implemented.

Studies of animal-to-human disease transmission found that brucellosis appears widespread in livestock in both urban and peri-urban areas of Kampala, but that human infection is low in both producer and nonproducer households. This is probably because of awareness of the dangers associated with consumption of raw milk. But milk samples were found with high levels of antimicrobial residues, which can result in health disorders such as allergies and drug resistance. There is a need for intervention from urban extension services and public information campaigns about the dangers of using these antimicrobials. These results show significant potential health risks from livestock raising for both producers and nonproducers, even if current health problems are still limited. This situation points to the importance of improved policy guidelines and the need for public information campaigns about safe livestock raising.

The overall results of the study fed into a multilevel participatory review of Kampala's health ordinances, which helped raise awareness of the risks from urban livestock raising and other agricultural practices while highlighting its importance as an income source for large numbers of Kampala households. The process concluded with City Council approval of a set of simplified, coherent ordinances, which have been pilot-tested with local residents as part of a sensitization campaign. This campaign needs to deal with another finding of the HIA: even if poor urban farmers and residents understood the health risks posed by UPA, they felt powerless to do anything about them because of their limited options—daily survival and feeding the family are the priorities, especially for women. Thus, implementation of the new ordinances will need to go hand in hand with efforts to improve basic services like water and sanitation as well as to enhance the capacity of UPA to address food security and income needs.

CONCLUSIONS

An adequate health-impact assessment of urban agriculture is still incomplete. Research questions remain concerning the level of chronic disease risk posed by contamination of urban food from air pollution, as well from industrial effluents. Further assessment is needed of the health risks of using biological wastes as fertilizer. Research questions also remain regarding the infectious disease risks posed by urban livestock keeping. Although cooking destroys most pathogens in food, farmers may be exposed to higher risks of infectious disease than consumers through their handling of organic wastes. Adequate waste treatment systems and sanitation need to be provided to poor countries' urban areas, but the technologies should be designed to capture the nutrients in waste for increased food production. Control of discharges into soil, air, and water by industries, whether large factories or small kiosks, is likewise essential. Existing environmental legislation needs to be made effective by proper implementation through both community action and government support in urban neighborhoods. ■

For further reading see *Feeding Cities in Anglophone Africa with Urban Agriculture: Concepts, Tools, and Case Studies for Practitioners, Planners, and Policy Makers*, CD-ROM available from Urban Harvest (CIP-Lima) as part of a web-based course at http://etraining.cip.cgiar.org; and Smallholder Dairy Project, *Public Health Issues in Kenyan Milk Markets*, Policy Brief 4 (Nairobi, 2004).

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