

# Strategic Analysis Paper

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## Feeding the Cities: Is Urban Agriculture the Future of Food Security?

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### Key Points

- In developed countries urban agriculture plays only a minor role in improving the food security of an area. Lack of space and the absence of economic incentives limit increases in crop production.
- Urban agricultural production constitutes a large proportion of the total food supply in developing cities. Urban farms increase the availability of nutritional food to the urban poor.
- Production and security of urban crops in developing countries is limited by both the illegality of urban farming and the effects of pollution, which reduce crop yields. Future production levels and the security of urban agriculture are uncertain, due to the encroachment of urban sprawl onto farm lands.

### Summary

Urban agriculture produces 15 to 20 per cent of the world's food supply and could play a major role in achieving global food security. Urban agriculture refers to the production of both food and non-food products in urban and peri-urban areas. The growth of urban agriculture is a result of a global increase in migration from rural to urban areas. Urban populations are more vulnerable to food insecurity, as they rely on external sources for their food needs and are thus exposed to greater supply risks. Some commentators suggest, however, that urban agriculture may provide the solution to food security issues in cities. The potential contribution of urban agriculture to food security differs between developed

and developing countries. In cities in developed countries, urban agriculture is limited by a lack of space and the absence of economic incentives; however, in the developing world, urban agriculture has considerable potential to improve food security. Key issues, such as urban sprawl, contamination threats and legality, must be addressed for urban farming to have a sustainable future.

## Analysis

### Urban agriculture in developed countries

Urban agriculture is experiencing burgeoning popularity, with gardens springing up in many cities in Australia, Canada, the United States, England, France and New Zealand. Land plots to grow crops are diverse, including windowsills, rooftops, basements, walls, recreational grounds and roadsides. These gardens mostly operate as community gardens.

Despite its growing popularity, urban agriculture feeds only a very small percentage of the population in these cities. The North American Urban Agriculture Committee estimates that urban areas produce only 5 per cent of urban food consumption. Production capacity is limited by the amount of space available and the high costs associated with urban farming.



### *Issues of Land Availability*

A major limitation to urban agricultural production in developed countries is the availability of suitable plots. It is estimated that 162, 000 to 232, 000 acres of land would be needed to supply New York City stores with fresh fruit and vegetables of urban origin. A comprehensive survey of space available in New York, found only 6, 068 acres of land that could be used productively for urban agriculture. Space is further limited by the opposition of urban planners to the integration of farms into cities; they believe it can interfere with more productive urban development. Residential yard areas are the most viable spaces for this development in most cities.

Solutions to limitations on space can be found in alternative farming methods. Vertical gardens may be grown on the exterior of buildings. Hydroponics and aeroponics have the capacity to increase crop yields by 15 to 20 per cent, without requiring large plots of urban land. These farming methods are becoming increasingly popular and methods to improve crop productivity are currently being investigated. For urban areas to feed a substantial part of their populations, residents must be involved in farming. As the cost of food is low, residents from developed countries lack the incentive to grow their own food. Demand for agricultural produce, therefore, cannot be met through traditional farming methods in urban areas.

#### *Economic Limitations*

Another barrier to the widespread growth of urban agriculture is its high cost. Food produced through urban agriculture is no cheaper than store-bought food. Despite reduced transport costs, urban production is expensive because of its high start-up costs, expensive city land and the cost of labour. In many cases, land could be used more productively for urban development. Urban agriculture is too economically inefficient to provide incentives to encourage more farmers to engage in it. Despite this, there is some potential for urban agriculture to be more economically viable in the future. People in the developed world currently pay prices for food that do not reflect their full cost of production. In a less globally food-secure environment, with higher food prices, urban agriculture may become more cost-effective.

Most developed countries currently lack the ability to feed large portions of their population through urban agriculture. If urban agriculture is to contribute to food security in these areas, new technologies must be implemented that enable high yielding operations, without the need for large plots of vacant land. Urban agriculture in developed cities is expected to increase due to the popularity of community projects directed towards growing urban farms. Total crop production will, however, remain a minor part of total supply. In the current environment, urban agriculture will remain a leisure activity rather than an alternative food source.

#### **Urban Agriculture in developing countries**

The role that urban agriculture plays in food security is much greater in developing countries. It is practiced widely in developing countries such as India, Vietnam, China, Cuba, Ghana, Uganda and Kenya. In many of these areas, produce from urban agriculture constitutes a large percentage of total crop production. Around 90 per cent of fresh vegetable consumption in Ghana's capital comes from production within the city. In Hanoi, Vietnam, 80 per cent of fresh vegetables and 40 per cent of eggs are produced by urban and peri-urban agriculture. This level of production can be attributed to the large proportion of the population involved. In some Asian cities, as much as 80 per cent of the population is involved in urban agriculture; in African countries, approximately 40 per cent of the urban population is involved. Urban agriculture is particularly beneficial to the urban poor, as it provides a stable source of nutrient-rich food that would otherwise be unavailable. Urban agriculture in the developing world does, however, face a number of challenges, including

health concerns, the encroachment of urban sprawl onto farming areas and its uncertain legal status. These factors limit the production and stability of these food sources.



#### *Nutritional Improvements*

Urban agriculture has the potential to improve the nutritional status of those who lack access to nutrient-rich food. People living in slums have limited access to fresh fruit and vegetables. Food consumption mainly consists of cheap, processed foods with low nutritional quality. Even when fresh fruit and vegetables are available, they are often unaffordable. The urban poor spend 50 to 70 per cent of their income on food. This is twice as much as is spent by rural dwellers. The urban poor are therefore the most vulnerable to increases in food prices; when money is short, people will tend to adjust consumption towards high calorie foods with low nutritional value. Urban agriculture has the capacity to overcome this situation by providing a secure source of nutritional food for the urban poor. The benefit that urban agriculture has on the health of the urban poor has been noted in Zimbabwe, Kenya, Uganda and Haiti. In these areas, poor households that practiced urban farming were compared with those who did not. It was found that households practicing urban agriculture had greater food security, ate more meals, maintained a balanced diet year round and used their savings to buy food items that would otherwise be unaffordable. Their children also had better health and nutritional status<sup>1</sup>.

#### *Pollution and Health Concerns*

The nutritional benefit experienced by the urban poor who practice urban agriculture, is counterbalanced by the threat of contamination and disease. In slum areas particularly, there are unsafe water supplies, poor sanitation, uncollected garbage, polluted rivers and poor air quality. Urban soils may also contain lead, arsenic and other toxins. These polluted environments create health hazards and have the potential to reduce both crop yields and the nutritional quality of the produce. To reduce these problems, pollution must be controlled through the implementation of anti-dumping regulations and programmes to monitor contamination in urban produce.

Air pollution is also rapidly increasing in urban areas and is more difficult to control. In highly polluted areas of China, crop yields have decreased by 25 per cent. For urban agriculture to be a viable source of food security, steps must be taken to protect crops from air pollution. As clean water is difficult to find, crops are often watered with gutter water or wastewater. The use of wastewater in agriculture can be beneficial, as it reduces the need for expensive fertiliser and improves sanitation. When untreated, however, these water sources may contain disease-causing pathogens. The United Nations Development Programme recommended that low cost pathogen elimination processes should be used to reduce the risk of disease, but these would be unaffordable for many farmers.

### *Illegality of Urban Farming*

Urban agriculture is illegal in many countries, due to public health, administrative and social concerns. The illegality of urban agriculture results in increased food insecurity, reductions in crop yields and it prevents farmers from adopting sustainable farming practices. Police in Zimbabwe have been known to slash the crops of urban farmers. This insecurity prevents farmers from planting long-term crops and therefore encourages the planting of low yielding, inedible looking plants that can be obscured from police and possible thieves. If urban agriculture is to be a source of food security, laws and regulations prohibiting it must be lifted. In Ghana, the initial hostility of officials towards urban agriculture changed as its benefits began to appear and its popularity amongst the citizens forced that democratic nation to agree. Despite this, no laws protect urban farmers and their crops and urban farming is still unregulated in Ghana.

Regulation of urban farming would require considerable resources and many developing countries lack the infrastructure and institutional framework to monitor it. As legal protection for urban agriculture is difficult to achieve, passive agreement from the government is an important step in achieving greater food security in the interim.

### *Threat of Urban Sprawl*

Due to increasing urbanisation, peri-urban farms and vacant lots are being demolished to make way for new buildings. These developments take arable land and push farmers onto land with low fertility and production capacity. Farmers in Hanoi and Accra have already lost land to property developers, which will have a profound impact on the production and sustainability of urban agriculture in those cities. To ensure the security of urban farms, they must be legally protected and town planners must learn to incorporate them into the design of cities.

### *Factors that enable high production*

The main factor that enables developing countries to produce more from urban agriculture than developed countries, is the proportion of the population involved. In many poor areas where urban agriculture is practiced, 40 to 80 per cent of the population is involved. This is in stark contrast to the 10 per cent of people who are involved in North American towns. In high production areas, urban farming exists as traditional, soil-based farming in peri-urban spaces, home gardens and vacant lots. In many cases, the participation of urban dwellers in agriculture resulted from necessity, to provide both food and employment. Urban dwellers

in developed countries lack the motivation to become involved, as food is readily available. Developing countries can also produce more because their cities are often less developed, meaning there is more space available for agricultural production. Mass participation and availability of space are the major requisites for urban agriculture to be a viable solution to food security in developing countries. Given the large scale conversion of urban farm land into buildings, however, the future security of urban agricultural production is uncertain.

In developing countries urban agriculture plays a major role in improving food security and the health of the community. There are multiple factors that will determine whether urban agriculture will continue to grow or diminish in the future. A major concern is the encroachment of urban sprawl. For urban agriculture to become a secure source of food, not only must bans on urban farming be lifted, but legislation to protect urban farms from city development will be needed. To ensure the long-term productivity of crops, farmers must be educated in sustainable farming practices, as well as strategies to reduce crop contamination. Because of their high participation rate, developing countries certainly have a large capacity for urban agricultural production. If urban agriculture in developing countries is adequately supported and monitored, it could provide a viable solution to food security issues in growing cities.

The number of people living in urban areas is increasing dramatically. 49 per cent of the world population lived in urban areas in 2003. This increased to 53 per cent in 2012. As urbanisation proceeds, food insecurity issues in the cities are sure to increase. Megacities are particularly vulnerable to food insecurity, as they rely on lengthy supply chains to meet their consumption needs. Urban agriculture could mitigate some of these food supply risks.

At present, the situation of urban agriculture differs greatly between developed and developing countries. In cities in developed countries, urban agriculture is predominantly a recreational activity, rather than a reliable source of food. The cost of urban farming is too great to provide a viable alternative to the supermarket. As food security is high in developed cities, there is little incentive for widespread adoption of urban farming. The productivity of urban agriculture in developed countries will depend on technological advances and relative food production costs. If food becomes more expensive and supplies less secure, the benefits of urban agriculture may become more apparent.

In some cities of the developing world, urban agriculture already has an important role in improving food security and increasing the availability of nutritional food for the urban poor. If it is to continue to play a role in food security, however, the encroachment of urban sprawl onto farm land must be prevented. There is considerable potential for urban agriculture to play a greater role in food security if contamination is reduced, sustainable farming practices are introduced and bans on urban farming lifted, but these challenges may yet prove difficult to overcome in developing countries due to the lack of the necessary infrastructure.

<sup>1</sup>D. Maxwell, 'Alternative food security strategy, A household analysis of urban agriculture in Kampala, *World Development*, vol. 23, no. 10, 1995, p. 1669 and M. Regis, G. Bartels, G. Philocetete, *Rapport Final. Project Horticulture Urbaine*. CARE Haiti, Petionville, Haiti.

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