

## A Growing Opportunity

Urban agriculture takes root in empty lots and abandoned spaces

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Argentina's 2001 meltdown hit the city of Rosario hard. Fully 800,000 of its 1.2 million residents were plunged into poverty because of widespread unemployment caused by the economic crash.

To cope, the city, located about 300 kilometres northwest of Buenos Aires, turned to a seemingly quixotic strategy -- urban agriculture. It turned over public land, offered tax breaks to owners of vacant lots who agreed to let poor residents grow organic produce on their property, and began to supply tools, seeds and other supplies.

Before long, more than 800 community gardens had sprung up, supporting 10,000 farmers and their families. What they didn't need for themselves, they could sell in one of seven new farmer's markets established by the city.

"The program not only helped urban farmers feed themselves, their families and their neighbours," says Raul Terrile of Rosario's Centre of Agro-Ecological Production Studies, "it also created some stability and brought renewed hope to their lives."

Urban agriculture is now a feature of life in Rosario, says Terrile. Though the number of people farming in the city has slipped to about 3,000 with economic recovery, urban agriculture has transformed former dumps and vacant lots into green and productive spaces and is increasingly appreciated by residents.

Rosario's program is just one small strand in a 30-year trend that has seen agriculture mushroom in cities even as the world urbanizes at a pell-mell pace.

Though regarded by many as an oxymoron, urban agriculture "is not a relic of the past that will fade away," insists the RUAF Foundation (Resource Centres on Urban Agriculture and Food Security), a global network of six regional bodies. "It is an integral part of the urban system."

And, adds Luc Mougeot, a senior program specialist at Ottawa's International Research and Development Centre (IDRC) and an internationally recognized expert on the subject, it's changing the way people in cities feed themselves.

Globally, an estimated 800 million people, the majority of them women, are engaged in agriculture -- everything from small-scale gardens to the rearing of livestock -- within or



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LOS ANGELES: A farmer tends to the South Central urban garden. The farm made news this week when police removed protesters from the property slated to become a Wal-Mart warehouse.

near cities and towns. According to the UN's Food and Agriculture Organization (FAO), as many as two-thirds of urban and suburban households in the developing world are involved in some sort of farming.

Urban agriculture may now contribute as much as a third of all food consumed in cities, says Mougeot. Even that understates its importance in many developing world cities, he says. "On some specific food products, it's already way above that."

For instance, urban farmers now supply 90 per cent of Accra's fresh vegetables, 79 per cent of Addis Ababa's milk and half of Hanoi's meat. Urban agriculture also has a potent presence in the fast-growing cities of China, part of a government strategy to alleviate social dislocation and balance economic growth.

Shanghai boasts 2.7 million farmers -- nearly a third of all workers. In Beijing, 600,000 people work directly in agriculture and a further 1.2 million indirectly. Urban agriculture provides 26 per cent of the city's employment and contributes six per cent of its GDP. Much of the farming takes place in so-called "peri-urban" areas surrounding built-up parts of the city.

Nor is urban agriculture exclusively a feature of developing world cities. With more than 8,000 plots, Montreal has the most extensive network of community gardens in North America. Residents who snare one of the 18-square-metre city-owned plots grow a wide variety of mostly organic fruits and vegetables for personal consumption.

In Toronto, the Community Garden Network includes more than 100 community gardens, and vegetables are sprouting on highrise rooftops throughout the city. There are even community gardens in Whitehorse and Inuvik, where a hockey rink has been converted into a greenhouse.

In Berlin, 15 per cent of the city's land is used for urban agriculture. All 80,000 of Berlin's allotment gardens are in use, with 14,000 people on a waiting list.

The rapid urbanization under way in Asia and Africa is one key driver of urban agriculture's growth. "What you have is a gravity shift of the market for goods from rural areas to urban areas," says Mougeot.

Another is the poverty that urbanization too often generates. "As you become poor," says Mougeot, "food, which is an essential need, takes up a growing share of your budget" -- 60 per cent or more for many poor families in developing world cities.

Farming has a double benefit for poor urban families: it cuts their food bills, and generates badly needed income. The FAO says even small "micro-gardens" can bring in up to \$3 U.S. a day for poor families -- not insignificant when you consider almost three billion people worldwide survive on less than \$2 U.S. per day.

There's also evidence urban agriculture improves nutrition. African studies show that urban farm families consume more calories and protein than non-farming families, and their children are taller and heavier.

Though urban agriculture is widespread throughout Africa and Asia (where urban aquaculture -- small-scale fish farms in ponds and aquariums -- is a hot trend) it generally operates outside the regulated city system, often illegally. The few cities that have actively embraced it are mostly in Latin America -- places such as Quito, Porto Alegre and Havana, which embarked on a large-scale program of urban agriculture after the Soviet Union's collapse in the early 1990s left Cuba economically bereft.

Since then, says Mougeot, Havana has cut some of its less effective farming practices and focused on more productive ones. "The end result is the total harvest has been sustained or increased," he says.

But most cities still view farming as incompatible with urbanity. Even in Rosario, planning

authorities haven't yet formally accepted farming as an appropriate land use, says Vikram Bhatt, a McGill University professor of architecture who is directing a unique project that is challenging the anti-farming mindset of urban planners and architects.

Called Making the Edible Landscape, it involves pilot projects in three cities -- Colombo in Sri Lanka, Kampala in Uganda and Rosario -- designed to showcase the value of urban agriculture as a permanent feature of city and housing design.

Each project is different. In Colombo, a densely packed slum neighbourhood is being painstakingly upgraded. About half the houses have no yard, and the flimsy buildings ruled out rooftop gardens for now. So Bhatt and his team have concentrated on making effective use of small spaces like balconies and windowsills.

The project in Rosario involves upgrading two slum neighbourhoods. But there's more space than in the crowded Colombo slum, so Bhatt's team is looking at growing fruit, vegetable and grain crops along road allowances and in community gardens.

In Kampala, they're building a new suburb that combines areas for gardening with minimal standards for roads, drainage, water supply and sanitation to keep houses affordable for the poor.

What excites Bhatt is that authorities in Kampala have formally accepted urban gardening's place in the cityscape. "They have made it legal now. That's a big, big achievement.

"The range and potential of this approach is becoming very, very clear," he says. "It's a very exciting, forward-looking way to make cities."

Advocates say urban agriculture has many benefits beyond promoting food security and generating income. For example, says Mougeot, it can help reduce greenhouse gas emissions. "Transportation of food is an important producer of those gases," he says. "The closer you can grow the food to your consumer points, the more you're contributing to reducing those gases."

Urban agriculture can also help cities turn the oceans of waste they generate into a productive asset. When used to irrigate crops, the nutrients in wastewater can significantly increase crop yields -- and hence incomes. In Pakistan, one study found that farmers using wastewater earn about \$300 U.S. a year more than those

using freshwater.

The problem is that untreated wastewater carries health risks, both to farm workers and consumers who may eat contaminated vegetables. So researchers are experimenting with low-cost ways of treating wastewater for use in urban agriculture.

One project in Dakar, Senegal, for example, uses an aquatic plant known as water lettuce as a biological cleanser. A Canadian-backed project in the Indian city of Hyderabad, where 100,000 urban farmers rely on untreated wastewater to irrigate their crops, has come up with seven ways to mitigate health and environmental risks.

Another, in water-starved Jordan, developed an inexpensive system for capturing and recycling "greywater" -- all household wastewater except toilet water -- to irrigate home gardens. Users quickly recovered their costs in savings and extra income earned through the sale of their produce.

"We measured a 10-per-cent impact on poverty in terms of the amount of income they earned," says Naser Faruqi, team leader for urban poverty and the environment at IDRC. The approach is now being adopted throughout the region.

Though rural migrants are still the main practitioners, urban agriculture is increasingly a career option for people born in cities. "This is a new phenomenon," says Mougeot. "It's an

entry point into the urban labour market for the recent arrival, but it's also an alternative for a growing number of people."

In Xochimilco, Mexico, for instance, urban farmers once grew food crops. But because they rely on untreated wastewater for irrigation, they've converted to flower gardens. "They're being converted very often by the children of the original farmers, who've gone to university, trained themselves in agronomy and come back to the family business," says Mougeot.

In North America, urban agriculture has different benefits. It can generate microclimates that reduce energy consumption, provide an outlet for aging populations and, through community gardens, help rebuild derelict communities.

"In Cleveland, it's amazing what they've done in the central city," says Mougeot. "They've revamped whole neighbourhoods that were going down the drain."

The secret, he says, is to mix urban agriculture with other land uses. "The Royal York Hotel grows its fine herbs on its roof top. That's mixed use."

The future for urban agriculture looks bright, says Mougeot.

"People are looking for ways to bring back nature in the city. This is one way that not only greens up the city, but provides you with food, employment and a better sense of community."

Just ask the people of Rosario.

800 million: Estimated number of people engaged in agriculture within or near cities and towns.

Two-thirds: Estimated number of urban and suburban households in the developing world involved in some sort of farming.

2.7 million: Number of farmers in Shanghai.

600,000: Number in Beijing who work directly in agriculture.

1.2 million: Number in Beijing who work indirectly in farming.

14,000: Number of people in Berlin on a waiting list for an allotment garden.

80,000: Number of allotment gardens currently in use in Berlin.

Countries with highest proportion of urban population in slums

Ethiopia: 99.4%

Chad: 99.1%

Afghanistan: 98.5%

Somalia: 97.1%

Niger: 96.2%

Slum-free countries

Cyprus

Singapore

Tuvalu

Palau

283 million: Number by which world's slum population grew between 1990 and 2005.

72: Percentage of all city dwellers in sub-Saharan Africa who live in slums.

1.4 million: Canadians the UN says live in slum-like conditions.

581 million: Number of people who live in slum neighbourhoods in Asia.

180 million: In China

160 million: In India

134 million: In Latin America

51 million: In Brazil

41 million: In Nigeria

The Urban Century

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