

Highly productive

By Sarah Murray

Published: April 24 2010 01:43 | Last updated: April 24 2010 01:43



An urban farm design by New York consultancy BrightFarm Systems

Until a few weeks ago Callum Saunders' tiny east London balcony was packed with planters – but not only ones containing flowers or herbs. In an experiment to see just what edible produce he could grow at his small flat in Hackney he filled small containers with rocket plants, lettuces, carrots and runner bean and tomato vines, documenting his micro-agricultural activities on a blog: londonvegetablegarden.blogspot.com.

Now, however, Saunders' balcony is forlorn and empty after his move to Richmond, west London, and the acquisition, after a long wait, of an allotment. But with long queues for such plots in the UK (about 6m people would like one of just 200,000 available nationally, according to insurance company LV), other would-be urban farmers are following Saunders' example and looking elsewhere for space to plant their vegetables.

As the world's cities expand rapidly, demand for fresh, local produce increases and metropolitan authorities gradually start to ease planning restrictions, urban farming is being seen as a new source of food and more than a hobby for green-fingered apartment- and loft-dwellers. And Britain's leisure horticulturalists are not the only municipal residents keen to grow their own produce. In developing countries citizens are using empty plots of land as sources of crops and income. In Rosario, Argentina's third largest city, vermiculture (using earthworms to compost fruit and vegetable waste) is providing organic fertiliser for neighbourhood plots while in Kampala, the Ugandan capital, urban agriculture is now a substantial part of the informal economy, with about 35 per cent of households harvesting produce from gardens and abandoned plots of land.

However, while vacant corners of land and allotments in suburbs are part of the city farming picture, some argue that acres of potentially valuable farming "land" lie above street level on the roofs of apartment blocks, offices and factories. "There are a lot of flat roofs but we don't always see them as assets," says Sarah Gaventa, director of public space at the UK's Commission for Architecture and the Built Environment (Cabe). Architects, she adds, often fail to include in their designs spaces that gardeners could use.

"We're still designing flats without balconies," says Gaventa, who points out that rooftops and terraces often lack the water supply needed to make this kind of gardening practical. "If you give people even a tiny bit of outside space they

'Skyscraper farms' of the future

As interest in rooftop gardens among city residents grows, a professor at New York's Columbia University has developed an idea that could take urban farming to a new level. The concept of the skyscraper farm, developed by Professor Dickson Despommier, envisages city centres with entire buildings devoted to growing fruits and vegetables. Given predictions that almost 80 per cent of the world's population will live in urban areas by 2050, Despommier argues, an area of land 20 per cent larger than Brazil will be required to feed them. Yet most of the land suitable for raising food crops is already in use.

He and his colleagues at Columbia University suggest that multi-storey buildings

can do quite a lot of food growing, so in building design there's a lot of [unrealised] potential."

And, while health and safety legislation and planning laws do not always make it easy to capitalise on "greenable" spaces, the regulatory environment is changing. In the UK, informed by low-carbon policies, city authorities are starting to consider measures to promote the development of roof gardens. In cities such as New York tax breaks are available for building owners who invest in green roofs while authorities are starting to revise floor area ratio (FAR) zoning laws that currently limit the development of rooftops.

"The climate is changing for the better and the paradigm is shifting in terms of city policy towards food production. Hopefully the regulations will follow," says Zak Adams, director of ecological design at BrightFarm Systems, a New York design consultancy that provides technical services for the development of top-floor greenhouses.

"We're getting a huge response," says Lisa Goode, founder of Goode Green, a New York-based design and installation company whose projects include a rooftop farm in Greenpoint, Brooklyn. She founded the company after she and her husband installed a small rooftop farm around their Manhattan apartment. "We built it wanting just a simple kitchen garden," she explains. "But then the world started to change and everyone was talking about the whole local food movement."



Ambitious schemes to grow food and create gardens on rooftops are helping to green city skylines

could be designed as giant hothouses used to grow food year-round on an industrial scale at the heart of cities.

In the controlled environments that would be created, crop failure due to floods, droughts or pest invasions could be avoided. Meanwhile, like residential rooftop farms, the skyscraper farms would recycle their water and could avoid the pollution caused by agricultural run-off from conventional farms. Skyscraper farms have another big environmental benefit: the installation of large solar panel systems means they could be powered by clean energy.

City vegetable gardens come in many sizes. While Saunders' balcony amounted to just a few square feet, at the other end of the scale are projects such as the one installed by Goode in Brooklyn, which covers 6,000 sq ft and produces fruit and vegetables for local restaurants and shops. At the same time, roof farming techniques vary considerably. While owners of small balconies might simply use pots and planters, bigger rooftop farms require large amounts of soil. Goode says that at her Manhattan home she put almost 50 tons of soil into the vegetable section.

Of course, before installing a rooftop vegetable garden, owners need to consider something that is not a concern for ground-level gardeners: whether the structure will sustain the weight of up to eight inches of soil. "It's a huge amount of soil even for a small area," says Goode.

She advises upgrading the roof and in so doing extending its life. Installing a green roof is rather like covering a building with a protective insulation blanket, making its structure less prone to the cracking that arises from constant expansion in summer and contraction in winter.

And, to prevent problems caused by watering plants, sophisticated leak-detection technology can be installed during the upgrade without increasing the cost substantially.

While Goode's Greenpoint garden is soil-based, another system being used for rooftop farms is hydroponics (a technique for growing plants without soil). This is the method used by companies such as BrightFarm Systems and Sky Vegetables, a company that develops commercial-scale hydroponic farms on urban rooftops.

Bob Fireman, president of Sky Vegetables, says that hydroponics is also an environmentally efficient method of farming. “We can grow 20 times the amount of food using less than 5 per cent of the water of conventional soil-based farming.” However, even soil-based farming techniques are more efficient when conducted on rooftops. “A green roof system retains water, so you’re using less potable water and capturing rainwater,” says Goode. “We can grow vegetables in a lot less soil than on the ground, which is a great benefit, especially when you’re worried about roof weight load.”

Rooftop farms have other environmental benefits. Because they act as large sponges, green roofs help manage storm water runoff. They also provide a form of insulation, saving energy bills for those using air-conditioning or heating in the floors immediately below.

Moreover, the “sky garden” phenomenon has a citizenship element as, collectively, planted roofs can reduce what is known as the “urban heat island” effect, which is created by the many large surfaces in cities that absorb solar radiation and return it to the air as heat.

There are economic benefits, too, since those able to sell their produce have the potential to generate income. And, like any roof garden, access to open space and views can increase the value of the property. “Quality outside space in prime central London comes at a premium,” says Simon Godson of estate agency WA Ellis. “This is something buyers are willing to pay extra for and the better the access and usability of the outside space the more they will pay for it – in some cases as much as 15-20 per cent more.”

However, what excites most passion among the new generation of city rooftop farmers is the chance to get their hands into the soil. On some Sundays, when volunteers can spend the day working on the rooftop farm developed by Goode Green in Brooklyn, up to 75 people turn up. “People really want to do this,” says Goode. “Five years ago, the coolest thing was to be a banker – now it’s the coolest thing to be a farmer.”

Sarah Murray is the author of ‘Moveable Feasts: From Ancient Rome to the 21st Century, the Incredible Journeys of the Food We Eat’ (Picador, 2008)

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