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## Tokyo turns to rooftop gardens to beat the heat

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TOKYO - At a run-down three-storey office block in downtown Tokyo, government clerks and secretaries cool off amongst azaleas, hydrangeas and even blueberry bushes during coffee breaks, seemingly far away from the sweltering urban heat. The garden is not a perk for bureaucrats or reckless use of taxes in a city with some of the world's priciest real estate.

It's on the roof and, what's more, it's saving money. The oasis is the brainchild of Kazuyoshi Kojima, a 52-year-old public servant spearheading the drive to lower temperatures in Japan's cities.

Trapped by concrete and asphalt, the heat from heavy traffic and millions of air-conditioning units have made summer in the cities hotter - a phenomenon known as the "heat-island effect". "The rooftop garden helps to absorb heat and keeps temperatures inside the building lower," Kojima says.

"We used to set the air-conditioner at 20 degrees Celsius (68 Fahrenheit), and it was still unbearably hot. By having the garden up top, a setting of 27 or 28 degrees is just right." Similarly, in the winter the building only needs one hour of heating; for the rest of the day the heat is contained, significantly reducing electricity costs.

The drive to cool down Tokyo's summers comes not a moment too soon. Last month, the temperature in the city of 12 million averaged 28.0 degrees Celsius, almost three degrees higher than it was in the same month 30 years ago.

In 1972, there was just one day in July when the temperature did not fall under 25 degrees, compared with 15 days this year.

Plenty of ideas have been suggested to beat the heat, including one that would involve running cool water through a huge labyrinth of pipes under the city.

But that could be years away, and the scheme could possibly damage the fragile marine ecosystem as the warmed water is dumped back into sea.

### IT'S THE LAW

Assigned to tackle the heat-island phenomenon for Tokyo's Shibuya ward two years ago, Kojima helped draw up legislation requiring new buildings bigger than 300 square metres (3,230 sq ft) at ground level to plant gardens on a fifth of that surface.

That mandate is the strictest in the country, and has paid off so visibly that even the Tokyo city government is reconsidering its own regulations in the hope of emulating Shibuya's success.

Lately, Kojima says, he even gets phone calls from embassies inquiring about the project. Tokyo passed its own law in April 2001 stipulating that new buildings with a roof area of more than 1,000 square metres must plant greenery on 20 percent of the surface. To get around the costly task, however, many builders have slanted their roofs because the guideline applies only to flat surfaces.

Under its plan, the capital hopes to add 1,200 hectares (2,965 acres) of greenery on its rooftops over 15 years. At the pace it's going now, that could take up to 120 years. Shibuya, one of Tokyo's 23 wards, is way ahead of schedule.

When it first started, the ward, with a population of about 200,000, set a goal of increasing its total green surface to 23 percent from the current 21.1 percent over 20 years.

In the six months since the guidelines became legally binding last October, it reached the halfway point, adding more than 7,000 square metres of greenery on rooftops. "We'll have to reset our targets now, since our rooftops are being planted at such a high speed," Kojima says.

Kojima, who gave advice on product development before becoming a public servant, believes the secret of his success lies in his unorthodox ideas and penchant for risk-taking.

When he was handed the mission two years ago, he admits, he could not tell a cherry tree and plum tree apart. But to give builders and firms an idea of what the ward was asking of them, he decided to set up a model on the ward office's own rooftop.

### TEACHING BY EXAMPLE

His budget was zero and he had no assistants. Undaunted, Kojima walked around asking companies for help. He eventually found 29 willing firms and succeeded in converting the bare rooftop into a green oasis for free. Kojima went a step further. To assist both builders and suppliers, he came up with the idea of having the ward act as a go-between. The ward would recommend a list of carefully chosen suppliers to a builder, which in return would get a 20 percent discount on services or products from the suppliers.

Kojima inspected all rooftop gardens to make sure they met Shibuya's high standards. The results impressed the ward's administrators. To encourage more gardening, they decided to grant subsidies - shelling out money for the project for the first time - to suppliers who participate in voluntary planting. Kojima also got two assistants.

The subsidies have paid off already. Of the total 7,000 square metres planted so far, a fifth was on existing buildings voluntarily. "Rooftop gardening is the sort of thing anyone can do if they put their minds to it," Kojima says. "It really doesn't have to cost that much money."

Kojima, a nature-lover who years ago bought a patch of forest to prevent it from landing in the hands of golf-course developers, said his goal was to cover half of Shibuya with greenery, while setting a good example so others would follow.

"When I was young, all you needed to fend off the heat in the summer was a hand-held fan," he says. "I believe we could go back to that if we press on."

Story by Chang-Ran Kim

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