



CASE STUDY

Tokyo | Ecomowing

Greener Grass with Goats and Sheep

A construction company is realising its vision of biophilic cities by sending in goats and sheep to “mow” the urban landscape.

The Challenge

Japan’s Edo period (1603-1868) is known for its culture of sustainability, especially for its successful reversal of forest depletion. As a result Tokyo developed a vast waterfront space and greenery. But with the rise of urbanisation, the greenery in urban Tokyo dwindled. To address the loss of biodiversity, the Tokyo Metropolitan Government developed a “10-Year Plan” in 2006 with the aim to surround Tokyo once more with water and greenery. To contribute to the conservation of biodiversity in Japan, Kajima Corporation, a construction company, introduced the concept of building “Kajima Biophilic Cities” where humans and wildlife can both thrive. It has proposed to use goats and sheep to “mow” the green space to reduce cities’ environmental load.

Kajima’s environmental engineers were inspired by a picture of sheep grazing in New York City in the early 20th century. This led them to think of replacing machines with

goats and sheep. “Also, we’ve seen and heard about it from overseas. Management of green space using animals isn’t a rare thing in Europe. [In 2010], there was already the service of rental goats and sheep for grazing in the US,” said Mr Yuta Sone, one of the engineers.

Mechanical mowing is noisy, emits carbon dioxide and discharges waste. The engineers were confident that the animals could do the job with a lot less environmental impact.

Grazing, however, is not a common sight in urban Japan. Urban dwellers rarely see goats or sheep except in zoos or ranches in rural parts. The urbanites’ lack of familiarity led to initial concerns about the noise, smell, and containment of the animals when the idea was proposed. A trial was necessary to show that urban grazing is a safe and reliable method of green space management with many environmental advantages.





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The Solution

In 2010, the engineers launched the urban grazing trial in a Kajima-owned apartment in Tokyo with three goats. The green space was the lawn in front of the apartment. The three goats were brought in from a suburban farm to trim the 1,000 square metres of lawn in spring, summer and autumn. Each time, they stayed for three to four weeks, and slept under the apartment's porch. The trial, which lasted three years, gave the engineers ample data and knowledge on urban grazing. Mowing performance and the effect on vegetation were studied closely. The experimenters also tested different ways of tethering that would secure the goats while they are grazing, without entangling or loosening the ropes. Most importantly, the residents' responses were evaluated with surveys before and after the trial.

Before the trial began, the engineers met residents to explain the benefits of ecomowing and to give them a chance to interact with the animals. Nearly half of the residents expressed concerns with the possible smell and noise from the goats that would graze so near their homes. A year later, a follow-up survey showed that these concerns were gone. This is because goats that feed solely on weeds versus goats in zoos and ranches that eat concentrated feed, do not smell, explained Mr Sone. To their surprise, the urbanites also found the goat droppings to be odourless.

In addition, "Goat Festivals" were held once or twice a year at the apartment that allowed residents to get to know their "mowers" better. They could pet and feed the tethered goats, while enjoying fresh goat milk.

01 Goats are tethered while grazing to keep them from wandering off.

02 & 03 Goats and sheep become the highlight of the area.

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The Outcome

Before the trial, the green space was managed with the use of brush cutters once or twice a year. The frequency was not enough to prevent the growth of large perennial weeds. An added advantage of ecomowing was that the goats' constant grazing ate up the leaves of large perennial weeds, preventing the transfer of nutrients to the roots of the weeds.

After the first year of the experiment, there was a significant change in the vegetation. The biomass of tall perennial weeds such as the Canada goldenrod, an invasive alien species, decreased dramatically, while indigenous short cover plants (Japan's native bent-grass) began to flourish.

It turned out that the ecomowing, which achieved the triple zero goal—zero noise, waste and CO₂ emissions—did not just control the growth of vegetation but also created a positive psychological effect for residents.

Through surveys, the experimenters found an increase in the residents' conversations regarding nature, and more than 70% of the dwellers said that the presence of the goats made the landscape more natural and also gave a relaxing effect. Events such as

the “Goat Festival” allowed the urbanites and their children to come in contact with the animals in an urban setting. Such opportunities are highly valued for those living in densely populated residential areas with limited access to natural environments.

In a later trial, Kajima employed sheep to graze its solar plant. It found that sheep, which do not like jumping to high places like goats, were suitable, as they would not damage the low-lying solar panels. They were also a safer option when compared to mechanical mowing, which could also damage the panels.

Since then, Kajima has gone on to conduct urban grazing in other green spaces such as parks, riverbanks, temporary vacant land after the demolition of a building, construction sites and even rooftop gardens. “Although it was for a short period of time, we have done grazing on top of a building in Ginza, a place like Orchard Road (Singapore's shopping strip),” said Mr Sone.

While grazing presents an appealing and eco-friendly alternative to mechanical mowing, Mr Sone admitted that for now, ecomowing is still more expensive due to the costs incurred such as transporting the animals into urban areas each time they are needed, as well as fencing or tethering needed to contain the animals safely. To lower the costs, there is a need to cluster grazing sites so that the animals are easily transported.

“We're now trying this with sheep in Komae, a small city in west Tokyo. The sheep has been moving around the city to parks, riverbanks, shrines and staying at various urban farms from July this year.”

01 Sheep are suitable for grazing near low-lying solar panels because unlike goats, they do not like jumping to high places.

02 A goat interacts with its visitors.

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