

Urban agriculture for a sustainable city

We should take some initiatives to make urban agriculture practice a must for a sustainable city which also facilitates solid waste management. There is a great opportunity to manage the waste by transforming it into bio-fertilizer for both urban and nearby peri-urban agriculture farms.

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AT the beginning of the new millennium we live in a world of unprecedented population numbers. And currently cities are populated by about half of the world's population, a figure which is probably to increase to two-thirds by 2030. Currently, each person shares 4.7 acres of land considering almost 22 billion acres of productive land on earth.

However each person requires 6.2 acres for a satisfactory standard of living. Following this, earth is supposed to support only 3.5 billion people. But it already has a 6 billion population! How can they survive? Many poor countries have a small appropriated productive land, for

example Mozambicans have 1.2 acres of land per person. They are malnourished and disturbing their environment to survive.

On the contrary, Americans and Australians have an appropriated productive land of 24.7 acres per person. In fact, at the present time, there is sufficient food to feed the world's current population. But, the going on improper distribution is resulting in nearly one billion malnourished, often affected by diseases. It is of crucial importance for cities in developed countries to use resources more efficiently and that certainly includes their food supply. Urban agriculture makes a crucial contribution here.

Most of the cities have been designed with farmland for ensuring food security, timber, metabolism of nature, and envi-

ronmental protection. Even bio-fertilizer derived from urban solid waste has use for designed farmland productivity. For example, megacity Shanghai is significantly designed with farmland on its edge for mostly rice and wheat cultivation for feeding the city. Apart from that, almost 10,000 hectares on the outskirts of Shanghai are intensely cultivated for a great variety of vegetables for the city population. Interestingly, majority of the farmers depend on bio-fertilizer for their agriculture which comes from urban solid waste management. Urban agriculture can help cities make the best possible use of organic waste materials. A city is sustainable in terms of urban agriculture, it being able to supply food and offer livelihoods for city people.

Now we have to look at the country feature of Bangladesh. What is the scenario actually we observe in Dhaka city? Dhaka is now one of the world's fastest growing megacities. The metropolitan city of Dhaka has an area of 131sqkm with approximately 20 million population. In recent times, Dhaka has been challenged by numerous difficulties like unplanned urbanization, extensive urban poverty, growth of urban slums and squatters, food insecurity, solid waste management problem and environmental degradation. For better understanding of city sustainability, agriculture coverage, food security and appropriate solid waste management are being considered crucially.

According to an expert in the domain, Mohammad Nasir Uddin (2007), only 2.5% land is remaining for agricultural purposes within the Dhaka city jurisdiction. Presently, cultivable land is getting reduced alarmingly due to increasing population pressure leading to increasing demand for habitation in the urban area. As a consequence, agricultural land as well as agricultural production have decreased for Dhaka city. Presently, total food demand of city dwellers is met either from peri-urban area or areas further and further away from the city. Even daily vegetable demand is not met from urban household cultivation practices. However, transport facilities have



made it possible to bring supplies from further and further away which, however, add extra cost on the supplied food. That may not be affordable for all people especially the poor in the urban area.

According to another expert, Md. Rubayet Mortuza (2011), about 80,220 hectares are covered by concrete as a continuous roof, which is 65% of the area of Dhaka city. This space may provide a great opportunity to extend green coverage for food production for feeding the urban dwellers. Although insignificant number of city dwellers have already started rooftop gardening, but it focuses only on aesthetic value rather than on food production. City dwellers should be more concerned for food production for themselves.

According to the JICA (2005), per capita waste generation rate in Dhaka city is found to be 0.56 kg/capita/day. Presently, Dhaka City Corporation (DCC) is facing serious problem in dumping solid waste which is creating public health related problems for urban dwellers. If this situation continued then Dhaka would soon become an urban slum. But there is a great opportunity to manage the waste by transforming it into bio-fertilizer for both urban

and nearby peri-urban agriculture farms.

Hence, we should take some initiatives to make urban agriculture practice a must for a sustainable city which also facilitates solid waste management. We should make sure the use of bio-fertilizer for peri-urban and urban agriculture, increase roof gardening also for food, enhance farmers' motivation for using bio-fertilizer, strengthen civil society organizations' (CSOs) consciousness for urban agriculture for a sustainable city. Providing subsidies by the government to bio-fertilizer producer and consumer, increased effective coordination among Department of Agriculture Extension, Department of Environment and Dhaka City Corporation and other related departments should be ensured for urban and peri-urban agriculture through solid waste management. Eventually, decentralisation of administrative activities should be ensured for reducing urban population pressure on lands around the capital to allow its own food production as a sustainable city. In this lies a solution for its future as well.

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The growing, feeling house of the future

As people flock to urban centers where ground space is limited, cities with green walls and roofs and skyscraper farms offer improved health and well-being, renewable resources, reliable food supply, and relief to the environment.

DIANE ACKERMAN

IN the sizzling summer heat I've been thinking about igloos. To chill out in, of course, but also because I admire their elemental simplicity. Inuits traditionally used bone knives to carve bricks from quarries of hardened snow. A short, low tunnel led to the front door, trapping heat in and keeping out fierce cold and critters. Mortar wasn't needed, because the snow bricks were shaved to fit, and at night the dome ossified into a glistening ice fort. The human warmth inside melted the ice just enough to seal the seams.

The idea behind such homes was refuge from elements and predators, based on a watchful understanding of both. The igloo was really an extension of the self shoulder blades of snow and backbone of ice, beneath which a family slept,

swathed in thick animal fur, beside one or two small lamps burning blubber. All the building materials lay at hand, perpetually recycled, costing nothing but effort.

Picture most of our houses and apartment buildings today -- full of sharp angles, lighted by bulbs and colours one doesn't find in nature, built from plywood, linoleum, iron, cement and glass. Despite their style, efficiency and maybe good location, they don't always offer us a sense of sanctuary, rest or well-being. Because we can't escape our ancient hunger to live close to nature, we encircle the house with lawns and gardens, install picture windows, adopt pets and Boston ferns, and scent everything that touches our lives.

This tradition of doing and undoing doesn't really make sense or promote healthy living or a sustainable planet, so

there's an impassioned trend worldwide toward building green cities with living walls and roofs and urban farms in skyscrapers. Referring to "the north 40" would mean crops 40 floors up. In such a cityscape, the line blurs between indoor and outdoor.

Vertical gardens and living roofs are sprouting up everywhere. Mexico City's three eco-sculptures, carpeted in more than 50,000 plants, tower above car-clogged avenues. A blooming tapestry of plants adorns the exterior walls of the Quai Branly Museum in Paris. Inside Lisbon's Dolce Vita shopping center, a plush vertical meadow undulates. In Milan's Cafe Trussardi, diners and flaneurs sit in a glass-box courtyard beneath a hint of heaven: a vibrant cloud of frizzy greens, cascading vines and flowers. The Plant, an old meatpacking building in Chicago, has morphed into an eco farm, home to tilapia fish breeders, mushroom gardeners and hydroponically grown vegetables. Xero Flor America, based in North Carolina, has sold 1.2 million square feet of living roofs.

Patrick Blanc, a botanist and a pioneer of the vertical garden (whose own house in the suburbs of Paris includes growing walls and an aquarium floor, has designed or inspired living walls for the New York Botanical Garden and a luxury apartment building in Sydney, among dozens of businesses, homes, schools and museums, whose walls whisper and bloom. The goal is homes and public spaces that are live organisms that will scrub the air of pollutants, increase oxygen, reduce noise, save energy and refresh the spirit. Roofs planted with low-maintenance sedums and succulents blossom, changing colour with the seasons, providing a habitat for birds and, importantly, reflecting heat.

Big cities are hot spots, on average 13 to 16 degrees warmer than the surrounding countryside. On some summer days in New York City, the air hangs thickly visible, like the combined exhalations of 8 million souls. Steam rising from vents underground makes you wonder if there



isn't one giant sweat gland lodged beneath the city.

A big worry to environmentalists is the record number of people fleeing suburbia for city life. Three and a half billion people now live in cities, and scientists predict that by 2050 cities will contain two-thirds of the world's population and most of its pollution.

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A living building is really an entity with its own metabolism, which needs a brain of some sort to nourish it. That could be a human being, or better yet a robotic Jeeves (or maybe Leevies) who tends its herbal roof, meadow walls and human family with equal pride, and is a good listener. "Smart houses" already have plenty of bells and whistles run by savvy computer brains. Artificial intelligence is growing up fast, as are robots whose facial

expressions can elicit empathy and make your mirror neurons quiver.

One can easily imagine the day, famously foretold in the movies "Blade Runner" and "2001: A Space Odyssey," when computers feel pride, paranoia, love, melancholy, anger and the other stirrings of our carbon hearts. Then the already lively debate about whether machines are conscious will really heat up.

In J.G. Ballard's science-fiction short story "The Thousand Dreams of Stellavista," there are psycho-sensitive houses that can be driven to hysteria by their owners' neuroses. Picture living walls sweating with anxiety, a vine-clad staircase keening when an occupant dies, roof seams fraying from a mild sense of neglect. Some days I swear I'm living in that house right now.

The writer is the author of "The Zookeeper's Wife," and a contributing opinion writer.

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