

Greening the Urban Living



Ramanjaneyulu GV



“The world will not be destroyed by those who do evil, but by those who watch them without doing anything.”

- Albert Einstein

Author is an Agricultural Scientist with Centre for Sustainable Agriculture working on natural/organic farming across the country and can be reached at ramoo@csa-india.org.

Climate change presents a significant challenge for urban systems worldwide and its effects will likely intensify over the coming decades. While human collective action may limit the intensity of these effects, scientific evidence indicates that some are already happening and will continue to occur, irrespective of any ongoing mitigation.

Climate change impacts such as increased rainfall intensity, storm surges, and flooding and urban heat island effects are likely to affect the urban systems. Adaptation will almost certainly be required to cope with these effects. Small changes in the places we live and work, the way we consume can significantly help in not only adaptation but also mitigation. For example, recycling grey waters not only reduce water stress but also reduce methane emissions, similarly composting biowaste not helps in providing good manure for gardening, it results in cleaning the cities and removing the stinking spots.

Green buildings: Through a good planning at individual and community level its quite possible to build living and work spaces to reduce the overall impact of the built environment on human health and the natural environment by:

- Efficiently using energy, water, and other resources
- Protecting occupant health and improving employee productivity
- Reducing waste, pollution and environmental degradation

The construction material can be sourced locally, houses, apartment complexes and residential colonies can be designed to harvest more natural light and water and have better circulation of air. At household level and community level waste management can be planned. Increasing the greenery helps to reduce temperatures, carbon absorption and increase humidity in air.

Water harvesting and recycling: When Mumbai is flooded or Chennai went dry, we blame the municipal corporations for their inaction. The floods are due to the water we let out from our houses, residential or office complexes. This can be easily be fixed by harvesting rainwater which is also the best way to help cities from going dry.

The Niti Ayog report on 'Composite Water Resources Management' says 30 cities may run out of water by 2020 summer. So, harvesting rainwater is utmost important. Simple sand-char-

coal filters can be used to clean the water. The rainwaters from the houses, complexes, roads, flyovers, open spaces etc all can be used for harvesting. The harvested water can be stored and reused or can be used for recharging the ground water.

A. Reuse: for reusing, one need to make space for a filter and tank. The quantity of rainwater that can be harvested from a house of roof top can be calculated based on the formula mean

annual rainfall in mm x area in m² x runoff factor (0.9%)= collected rainwater in litres
for e.g. for a house of 200 m² in an area with 500 mm of annual rainfall would be about 90,000 lit.

B. Recycle: Greywaters (the relatively clean waste water from baths, sinks, washing machines, and other kitchen appliances) which can be easily be cleaned and recycled for use in kitchen, flush outs and gardening etc. This can significantly reduce the dependency on fresh water for activities which can otherwise be done with recycled grey waters.

C. Recharge: The rainwaters harvested can be used to recharge the ground waters using a simple soakpit. This helps in long run to build the ground water levels.

Home Composting: Every household generates at least 250 g of kitchen waste and often it is thrown out along with other non degradable waste. While non degradable waste has a way of recycling, bio waste has to be recycled through composting. This calls for the source segregation. At household level, the kitchen waste can be separated at simple techniques for composting can be done.

Else, the separation later becomes difficult and expensive. Similarly, the kitchen was can be composted at house hold level or community level and only non-compostable material can be picked up by the waste management teams of the local municipal corporations.

This decentralised approach of composting can also prevent the burden of transporting the bio-waste across the city stinking the roads. When composting can be done in a controlled conditions and the methane gas can be can be used as kitchen fuel.

Preparation of compost with kitchen waste: The compost which is required for home garden can be prepared at home itself by using kitchen

waste. Keep the decomposable kitchen waste in an earthen pot daily. Once it is filled take another pot. The filled earthen pot is covered with thin cloth to avoid egg laying of flies in the pot.

Put some cow dung and urine in the pot to accelerate the decomposition process. See that there should be sufficient aeration and moisture in the pot for decomposition. It takes around 4 months to get final product which can be used as compost.

Preparation of vermicompost: Take a container (3x3x1cubic feet) and make 3-4 holes to drain the water. Put some broken slabs, pebbles, brick piece at a depth of 2 inches. Then place a mesh and fill half rotten dung upto 2 inches. Release 250 g worms (available at vermicompost centres).

Place the kitchen waste, dried leaves and other decomposable waste in the container above the worms. Once it is filled, cover the container with wet gunny bag. Protect the container against ants, rats, birds and from direct sun. Regular water sprinkling over gunny bag is necessary to provide sufficient moisture to the worms. About 1-1.5kg Vermicompost is ready within 45 days.

Preparation of leaf mould or leaf compost: Pit of 4 m length, 2 m width and 1m height is made in which the dried leaves, fallen leaves and other crop residues are made into small bits and filled to a thickness of 15 cm. Above this layer, dung slurry as a layer of 5 cm thickness is applied to enhance the rate of bio degradation.

Then add saw dust, coir pith to provide carbon. Bone meal, rock phosphate, wood ash, egg shell powder can also be added in small quantities to minimize the nitrogen loss and to add phosphorous. The same pattern is repeated till the height of pit reaches 0.5 m above the ground level and is covered with red earth or mud followed by gunny cloth to prevent rain water entry and become an anaerobic process.

Occasionally water is sprinkled over gunny cloth to keep sufficient moisture for decomposing the produce. The material is turned upside down after 30-35 days. The compost will be ready in 4 months. To get the compost within 15 days, the material in the pit should be turned upside down every day.

Home Gardening: One of the important and useful activities that can be taken to build resilience into urban households in the era of climate

change is to grow as many plants as possible in the spaces available inside, outside or on the roof top of the houses. a. Indoor plants: inside the houses only shade loving and foliage plants can be grown.

These plants not only provide greenery and reduce the effects of temperatures but also reduce the carbon dioxide in the air. b. Home Kitchen gardens: Any little space which gets decent direct sunlight for 4-5 hrs at home can be used to grow fruits and vegetables. This can be in front of the houses, balconies, windows or roof tops.

Backyard Gardening: Whatever may be area in a home garden and whatever kind of soil, excellent vegetables can be grown. As the area is always limited even the worst soil can be amended easily to the desirable high fertility porous soil. If the soil is highly acidic or alkaline, this can also be changed to desirable soil pH.

A sandy loam soil with well supplied organic matter is best for growing vegetables. If the home garden soil is other than sandy loam, add enough compost or FYM and forked up deeply with the soil. If the soil is clayey in nature, add large quantity of sand and spread evenly. Soils for growing high quality vegetables must be friable, should absorb water readily, should dry off quickly at the surface and yet retentive of moisture. Vegetables will not grow well unless the soil is well drained, as excess water makes poor aeration. After correction of the soil as necessary according to situation and location, the soil should be spaded to a depth of 12-15 inches, allow it to dry up for some days and then soil clods should be broken to fine soil, grasses and debris should be removed completely and then leveled the soil. All soil preparation should be done atleast 3-4 weeks ahead of transplanting or sowing.

The entire garden area should be divided into blocks, keeping paths for movement. The selected place around the house should have sufficient sun light. Add compost 20-24kg/sq. foot area. If the land is low lying it is better to prepare raised bed to avoid water stagnation. Selection of vegetable crops for home garden depends on size of the area available and the choice of family members. When the available area is large enough, it will be desirable to produce all kinds of vegetables that the family members like provided that they can be grown satisfactorily in the region. If land is limited, it is wise to grow those crops that are produce a large yield per unit of area and

time. Tomato, brinjal, chilli, cucurbits (ridge gourd, bottle gourd, bitter gourd, cucumber), beans, leafy vegetables, radish, carrot, beet root, cabbage, cauliflower, onion, garlic are the main crops for an average size of the garden. If land is available sufficiently, banana, papaya, guava, plantain, lemon can be grown for home garden.

Roof top/Terrace Gardening: In urban areas roof tops become ideal space for setting up home gardens as they are open and have better access to direct sunlight. They can be grown in pots, containers, cement bags, big polythene bags, plastic buckets, tubs, on prepared beds, as square foot garden. While growing vegetables on terrace, it is better to use more compost (60%) instead of soil to avoid weight on slab and also hardening of the soil. Select the containers or pots according to root depth of the vegetables. In square foot garden a thick polythene sheet is spread on the floor and the side wall of beds is prepared with light weight bricks or wooden planks. The bed is filled with more compost (vermicompost, coir pith, leaf mould and saw dust) with little soil. Then the prepared site is divided into blocks of one square foot each. Sowing/planting is done in that individual blocks.

In pots

Select suitable size of the pots depends on root depth of the plants. For shallow rooted plants select shallow and broad type of pots which are suitable for growing leafy vegetables like palak, coriander, pudina, amaranthus etc.

Deep pots are selected for growing other vegetables like carrot, radish, tomato, chilli, peas. Bush bean etc. Selected pots should have 2 -3 drainage holes to drain out the excess water. To avoid blockage of the holes, fill some broken slabs or coconut shell pieces or small pebbles followed by a layer (one inch) of dried leaves and sand in the pot. Then fill the soil mixture i.e., red earth, leaf compost, vermicompost, vermiculite, coir pith in the ratio of 1:4:2:1:1(vermiculite is the waste material available at mica mines).

Soil hardening would be a serious problem in pots so adding more compost will reduce the risk. In addition to this adding of neem cake, castor cake, pongamia cake and custardapple seed powder to the soil mixture not only controls the pests but also supplies nutrients to the plant. Addition of coconut pith helps in holding the water and provides sufficient aeration to the plants.





Arrangement of crops

Cucurbits and other vine vegetables should be grown near the compound so that it may be used as staking. Long season crops or those occupying the land throughout the growing season should be planted together. Quick maturing crops like leafy vegetables should be planted in continuous rows so that the area may be planted with a single late crop. It is desirable to plant tall growing crops together and to locate them in northern direction so that they do not shade the dwarf crops.

Simple food and lifestyle choices can help in a big way. As consumers there is a need to shift towards local foods grown with low energy, low water and low chemicals. We need to do away with single use plastics. While these adaptation strategies at the household level can help the consumers to reduce their ecological foot prints and contributes for mitigation it is also important that public policy decisions can drive the change easily. For example, rainwater harvesting can be made compulsory, collection of biowaste can be stopped from any residential complexes and make it mandatory to compost. Like France, Roof top gardening can be made mandatory.