



## Emerging Trend of Urban and Peri Urban Agriculture in India

(\*Tuhani Akthar)

College of Post Graduate Studies in Agricultural Sciences, Umiam, Meghalaya, 793103

Central Agricultural University, Imphal, Manipur, India

\*Corresponding Author's email: [tuhaniakhtar212@gmail.com](mailto:tuhaniakhtar212@gmail.com)

### Abstract

Urban agriculture occurs either within a city or on its outskirts, encompassing the cultivation and production of a wide range of food and non-food items. It optimizes human and material resources already present in the urban environment, recycling and repurposing them. Consequently, it primarily serves the needs of the urban area it operates in. Urban agriculture can take various forms, such as small-scale homesteads, micro-level projects, or larger operations situated away from residential areas. Community farming is practiced on private, public, or semi-public land, including parks, roadsides, stream sides, railway sides, school grounds, hospitals, and public offices. The farming system consists of diverse food products, including vegetables, fruits, flowers, spices, medicinal and aromatic plants, mushrooms, as well as livestock like poultry, rabbits, goats, sheep, cattle, and pigs. Additionally, urban agriculture may involve fish farming, with carps, catfishes, cichlids, and beekeeping for honey production.

**Key words:** *Urban farming, Peri-Urban farming, Emerging trends*

### Introduction

Urban agriculture makes up one aspect of a city's food system. Each of urban agriculture's components - production, processing, distributing and the associated activities, is linked to a variety of community benefits. The advantages of urban farming differ depending on the specific type of farming, such as personal consumption, institutional, educational, for-profit, non-profit, and others. To achieve success in community-based urban farming endeavors, significant planning and dedication are necessary, driven by the unique interests and needs of a particular neighborhood or community.. Similar to any other effective endeavor, when residents identify the goals and ideals; with urban farming, the aesthetic and the potential benefits escalate. Urban farming projects that reflect and evolve from a community's cultural values and future vision are much better positioned to have a lasting impact and lead to more ecologically sustainable ways of providing food.

Examples of urban agriculture abound, existing in many forms including community and backyard gardens; rooftop and balcony gardening; growing in vacant lots, right-of-ways, and parks; aquaculture; hydroponics; fruit trees and orchards; market farms; raising livestock and beekeeping. Urban agriculture also involves post-harvest activities such as creating value-added products in community kitchens, farmers' markets and road-side farm stands, marketing crops and products, and addressing food waste. Importantly, urban agriculture is context-specific, meaning that its forms and practices vary according to the conditions of the local environment – social, cultural, economic, physical, and political.

## Emerging Trend of Urban and Peri Urban Agriculture

**1. Horticulture:** Horticulture components for the domestic purpose can be cultivated by micro farming on terrace or balcony. Nutritious and safe vegetables can be produced by soilless cultivation. Highly nutritious sprouts are nutritious and easily produced pulses (e.g. Green grams), microgreens and baby greens are meant for the exclusive production of high quality leafy vegetables. In early stage of growth, they have high level of nutrients and low anti-nutritional or toxic factors.

**2. Livestock and poultry:** Small animals and birds can be included in urban farming without much effort. Rearing Rabbits, poultry and quail can be reared in small areas available in the terrace or balcony of urban houses. They can be nourished using resources readily available in the garden, and their waste can be utilized as natural fertilizer for the plants.. Rabbits can be reared in small cages for meat purpose or for selling the breeding stocks. Breeds like Soviet chinchilla, Grey giant, New Zealand White etc will grow quickly. Male and female rabbits should be maintained in 3:7 ratios. Gestation period is 28 days and in the initial litter it produces 5-6 bunnies and the litter size increase in the subsequent kindlings. The bunnies can be weaned at 30-40days and the female can be bred again. Bunnies will gain weight approximately 2kg at 3 months of age. The rabbit diet should include source of fibre from grass or vegetable wastes. A concentrate feed consisting of energy source like maize, rice/wheat bran, and protein source of soya bean meal or oil cakes (ground nut, gingelly, cottonseed) etc can be given @100g/animal /day. Poultry birds like chicken and quail and can be reared in roofed cages with feeder and waterers. The floor space requirement in cage system is 450-525 sq.cm. (0.6- 0.75 sq. feet) per bird. Single birds are kept in a single row or multi row cages. More number of birds can be maintained in small areas by using battery cages with nipple drinking water provision, facility for egg collection and provision for removal of fecal matter. The birds can be fed with readymade layer feed or feed mixture prepared from ingredients like maize, rice husk, wheat bran, pearl millet, soybean meal, with vitamin and mineral supplements

**3. Aquaculture and fish farming:** It is a form of aquaculture in a limited space, like the rooftop or terrace. The technique can prove beneficial for urban farmers who want to cultivate fish for consumption or on a commercial scale but lack the space to do so. Food fish species such as tilapia, catla, rohu, common carp, pearlspot and Pangasius and even ornamental fish species can be grown in these systems. The size for the food fish species at stocking may range from 80-120 mm. The area of the tank or pond can be decided on the basis of available area on the rooftop. Similarly, the number of fish stocked would also depend on the area and depth available. Preferably, the depth should be 1 to 1.5 m and the stocking density of fish should be one fish per square meter. However, adequate strength for the roof and strong base for the bottom of the roof tank is necessary. Fishmeal, soybean meal, groundnut oilcake, clam meal, prawn meal, wheat bran and oil can be used for the preparation of the feed for fish. The rate of feeding should be 8-10% of the total weight of fish available in the system. Aquatic plants can also incorporate to facilitate the feeding for carp species and ornamental fish species. Exchange of the tank water (50%) is recommended fortnightly. Partial harvesting can be followed in these systems to cull the fast growing individuals. A marketable size of 700-900 g can be obtained in 8-10 months of culture period.

**4. Mushroom cultivation:** Commonly cultivated mushrooms are button mushroom (*Agaricus bisporus*), milky mushroom (*Calocybe indica*), paddy straw mushrooms (*Volvariella volvaceae*) and oyster mushroom (*Pleurotus* sp.). Milky and oyster mushrooms are most suited to equatorial climate and the protein content varies between 18-20 % on dry weight basis and contain high amount of dietary fibers and less expertise in production. The seed material of mushroom cultivation is spawn, which is a mass of fungal mycelium grown hygienically in artificial medium mostly on cereal paddy, wheat, bajra etc. Mushroom spawns

can be purchased from authentic sources. Composts or pasteurized agricultural wastes like cereal straw, sugarcane bagasse, saw dust, jute and cotton waste; dehulled corn waste, peanut shells, dried grasses etc can be used as medium or substrate. It can be pasteurized with hot water or steam at 58-62 °C for 4-5 hours. Freshly prepared grain spawn is mixed or placed in layers with pasteurized substrate on wet weight basis @3-4 % in case of oyster mushroom and 4-5 % in milky mushroom in a prefumigated clean room. Spawned substrate is filled in bags (2-8 kg) in layers of spawn and substrate and pressed tightly and hanged with the help of nylon rope. Ten to fifteen holes should be made in each bag to ensure aeration and drainage. These bags can be hanged or kept in the incubation room for spawn run, where the temperature is regulated to 25-30 °C and 80 % relative humidity. In case of milky mushrooms, fully colonized bags are covered with pretreated soil to give physical support to the fruiting bodies (casing). From a household mushroom production unit, two to three harvests can be carried out within 25-30 days period.

**5. Apiculture (Bee keeping):** Rearing of honey bee colonies in artificial bee hives is called apiculture. *Apis mellifera* and *Apis cerana* build multi comb nest with closed compartments and these are commonly used in bee hives. In a honey bee comb, a single queen, hundreds of drones and thousands of worker bees will be available. Bee hive should be kept in a manageable height in cool places away from houses, where good number of plants are available. During the rainy season, bee hives need protection from wind, rain and enemies. It should be exposed to sulphur or neem fumes and bees should be fed with 100 ml water with sugar syrup once in a week. One should wear net cap and gloves while handling bees. It is advisable to undergo training programmes on bee keeping before starting bee rearing.

## Conclusion

Urban agriculture practices are gaining momentum due to the increased need and awareness among the consumers. The dimensions of urban farming range from micro level in households to high tech commercial farms in peri-urban areas. Horticulture crops, birds and small animals, fishes, mushrooms and honeybees can be a component of urban farming. Plants can be grown in micro farming, soil less culture or protected cultivation. The success of the urban farming depends on the organic production strategies and proper management approaches.

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