AgriBio Innovations
(Published by Research Trend, Website: www.agribioinnovations.com)
ISSN NO. (Online): 3049-3862
Volume-2, Issue-1, Jan.-Dec., 2025 2(1): 67-69(2025)

Urban Rooftop Farming: Cultivating Change in India

Rupanagudi Unesha Fareq[1]* and Rupanagudi Beena Fareq[2]
[1]Teaching Associate, Department of Resource Management and Consumer Science, College of Community Science, ANGRAU (Andhra Pradesh), INDIA.
[2]Ph.D. Scholar, Department of Apparel and Textile Sciences, College of Community Science, University of Agricultural Sciences, Dharwad (Karnataka), INDIA.

(Corresponding author: Rupanagudi Unesha Fareq)*
(Received: 18 April 2025; Revised: 20 June 2025; Accepted: 08 August 2025; Published: 24 August 2025)
(Published by Research Trend)

DOI: https://doi.org/10.65041/abi.20

ABSTRACT: Rapid population and urbanization are dropping the amount of land that can be used for farming while food demand is rising. This makes people worry about food security and sustainability. An effective way to improve environmental stress, increase urban resilience and produce nutritious food is through rooftop farming a type of urban agriculture that makes use of unused locations. The COVID-19 epidemic increased its importance by emphasizing the necessity of sustainable urban food systems and local food production.

Keywords: Food security, Rooftop farming, Urban agriculture, Urbanization.

INTRODUCTION

Around the world, urbanization has become a significant phenomenon. The world's population is predicted to be 8.5 billion in 2030, 9.7 billion in 2050, and 10.9 billion in 2100 (United Nations, 2025). Around the world, as societies get wealthier, people consume more food and calories per person, which is concerning and presents a greater challenge for our future generations. This is because the land around cities is being used for commercial purposes, turning it into shopping centers, housing colonies, roads, and small and large industrial development. According to Buehler and Junge (2016), this results in problems including a decrease in cultivable land, an increase in malnutrition, and a longer commute to food production locations.

Urban agriculture is an evolving movement that aims to address the many goals of urban sustainability, such as storm water management, waste management using compostable waste, reducing the impact of urban heat islands, efficient food supply chains, food security, and equity. Addressing this issue requires implementing and practicing rooftop farming, a novel form of agriculture that provides city inhabitants with food security while also protecting the environment (Ashikuzzaman *et al.,* 2025 and Ruwanthika *et al*., 2025). According to Elisa *et al*. (2016), rooftop farming is a type of urban agriculture in which food is grown on building rooftops using container gardens, hydroponic, and aeroponic methods. The COVID-19 outbreak has had a wide range of effects on the food chain and has reached pandemic proportions. It has limited people's ability to purchase food by lowering wages and increasing job insecurity. Global lockdown measures have also made labor shortages, market access restrictions, and transit disruptions worse, which has resulted in food loss and waste.

The COVID-19 outbreak has brought attention to the need of local food production. Rooftop farmers increase the availability of organic, nutritious food and reduce the environmental impact of food transportation by growing food locally (Romdon *et al*., 2022., Mishra and Pattnaik 2021, Andini *et al.,* 2021, and Khan *et al*. (2020). Additionally, rooftop farms aid in building cooling which eventually lowers carbon emissions. There will be pressure to increase agricultural output in order to satisfy future food demands because there is a shortage of agricultural land, especially in Indian cities. Rooftop farming could be a good alternative for urban agriculture. It might supply organic food, mitigate the constantly worsening air quality, and greatly aid in the control of urban environmental concerns.

Although growing food upon roofs is an essential component of making cities more liveable and sustainable, green roofs are not the only way to ensure cities have access to food security. They ought to be seen more as an addition to existing urban food production sources (Kumar Ch *et al*., 2023). COVID-19 pandemic has underscored the importance of resilient food production systems, reinforcing the need for innovative urban farming solutions to meet the nutritional demands of a growing population (Kumar and Sharma 2025).
Through intensive production of perishable fresh commodities, creative marketing techniques including organic cultivation, variety creation, and crop diversification, urban agriculture is developing into a long-term enterprise by stabilizing and growing revenues. Food insecurity, urban biodiversity, and a variety of ecological systems are all improved by rooftop farming (Annie *et al*., 2023., Yaun *et al*., 2022., Harada and Whitlow 2020).

CHALLENGES OF URBAN ROOFTOP FARMING IN INDIA

In India, rooftop farming faces challenges such as weak capacity of buildings, high setup costs and limited access to quality inputs like seeds and nutrient solutions. Additionally, water scarcity in many Indian cities, combined with insufficient awareness and technical knowledge among urban residents, poses significant barriers to its sustainability. One major obstacle to urban farming is land access particularly in places with high population density (Zhu *et al*., 2024). Other obstacles include pests and illnesses, significant production losses result from this problem, which is made worse by the near proximity of crops to one another and to human habitation (Specht *et al*., 2014). The establishment and upkeep of urban farming systems necessitate large upfront expenditures for supplies including irrigation systems, equipment and infrastructure (Weidner *et al*., 2019). Once all the public benefits of the Vertical Garden will be widely recognized, a lot of people will want to take advantage of these benefits. Apart from aesthetic project can lead to urban farming giving way to edibles to be grown (Kumar *et al*., 2017).

CONCLUSION

In India urban rooftop farming offers a creative and sustainable way to address the problems of food insecurity and urbanization. It improves local food production, reduces environmental effects and promotes urban resilience by making use of unused rooftops. Growing food locally and enhancing urban environments can be accomplished with urban rooftop cultivation. In densely populated metropolitan areas, it increases food security, encourages sustainability, and lessens pollution.

REFERENCES

Andini, M., Dewi, O. C. and Marwati, A. (2021). Urban Farming During the Pandemic and Its Effect on Everyday Life. *International Journal of Built Environment and Scientific Research*, *5*(1), 51-62.

Annie, D., Yizhi, Z., Jean, W. and Marie, C. D. (2023). Urban farming with rooftop greenhouses: A systematic literature review. *Renewable and Sustainable Energy Reviews*,*188*.

Ashikuzzaman, M., Mohammad, S. H. S. and Atiq, U. Z. (2025). Integrating urban rooftop farming into city governance in megacities: A systematic literature review. *Cities*, *161*.

Buehler, D. and Junge, R. (2016). Global Trends and Current Status of Commercial Urban Rooftop Farming. *Sustainability*, *8*(11), 1108.

Durga Hemanth Kumar Ch, Rajini A. and Narm Naidu L. (2023). On Green Roofs: The Production of Vegetables. *International Journal of Theoretical & Applied Sciences, 15*(2), 62-64.

Elisa, A., Francesco, O., Kathrin, S., Susanne, T., Esther, S., Giuseppina, P. and Giorgio, G. (2021). The global rise of urban rooftop agriculture: A review of worldwide cases. *Journal of Cleaner Production*, *296*.

Harada, Y. and Whitlow, T. H. (2020). Urban Rooftop Agriculture: Challenges to Science and Practice. *Frontiers in Sustainable Food Systems, 4*.

Khan, M. M., Akram, M. T., Janke, R., Qadri, R. W. K., Al-Sadi, A. M. and Farooque, A. A. (2020). Urban Horticulture for Food Secure Cities through and beyond COVID-19. *Sustainability*, *12*(22), 9592.

Kumar, A. (2017). Vertical Gardens for India Social, Architecture Acceptance & Practice. *International Journal on Emerging Technologies (Special Issue-2017) 8*(1), 18-24.

Kumar, G. and Sharma, P. K. (2025). Feeding Cities from the Clouds the Rise of Vertical Farming in Urban Landscapes. *Biological Forum, 17*(5a), 11-15.

Mishra, A. & Pattnaik, D. (2021). Urban agriculture during and post Covid-19 Pandemic. *Biotica Research Today*, *3*(1), 62-64.

Romdon, A. S., Hartono, F. R., Murtiati, S., Arianti, F. D., Hariyanto, W. & Oelviani, R. (2022). Urban farming as a resilient strategy during covid-19 pandemic. *Journal of Resilient Economies*, *2*(1), 38–48.

Ruwanthika, G., Ruchira, G., Wanasinghe, Anjalika, U., Samaraweera., Ashoka, G., Chamila, R., Zammil, H., Zaher, A., Terrence, M. and Othmane, M. (2025). Urban agriculture: A strategic pathway to

building resilience and ensuring sustainable food security in cities. *Farming System, 3*(3).

Specht, K., Siebert, R., Hartmann, I., Freisinger, U. B., Sawicka, M., Werner, A., Thomaier, S., Henckel, D., Walk, H. and Dierich, A. (2014). Urban agriculture of the future: an overview of sustainability aspects of food production in and on buildings. *Agriculture and Human Values*, *31*, 33–51.

Weidner, T., Yang, A. and Hamm, M. W. (2019). Consolidating the current knowledge on urban agriculture in productive urban food systems: Learnings, gaps and outlook. *Journal of Cleaner Production*, *209*, 1637–1655.

Yuan, G. N., Marquez, G. P. B., Deng, H., Iu, A., Fabella, M., Salonga, R. B., Ashardiono, F., Cartagena, J. A. (2022). A review on urban agriculture: technology, socio-economy, and policy. *Heliyon*., *8*(11).

Zhu, Z., Chan, F. K. S., Li, G., Xu, M., Feng, M. and Zhu, Y. G. (2024). Implementing Urban Agriculture as Nature-Based Solutions in China: Challenges and Global Lessons. *Soil and Environmental Health*, *2*(1), 100063.

How to cite this article: Rupanagudi Unesha Fareq and Rupanagudi Beena Fareq (2025). Urban Rooftop Farming: Cultivating Change in India. *AgriBio Innovations, 2*(1): 67-69.