

THE ROLE OF URBAN AGRICULTURE IN FOOD SECURITY: A STUDY ON ENTREPRENEURIAL STRATEGIES FOR SUSTAINABLE FOOD SYSTEMS

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ABSTRACT

Urban agriculture, encompassing farming methods within urban and peri-urban areas, has gained significant attention as a viable strategy to address food insecurity, environmental degradation, and urban poverty. This research explores the multifaceted importance of urban agriculture, highlighting its social, environmental, economic, and health benefits. It further examines entrepreneurial opportunities and strategies to foster sustainable food systems through innovative practices such as backyard cultivation, participatory gardens, green roofs, vertical farms, and tech-enabled marketplaces. The study underscores the critical role of urban agriculture in enhancing food security, promoting economic resilience, and fostering environmental sustainability, especially in rapidly urbanizing regions like Asia and Africa. By integrating policy advocacy, public-private partnerships, and climate-adaptive technologies, urban agriculture presents a scalable model for addressing urban challenges while encouraging entrepreneurship. The findings advocate for a holistic approach that combines technical assistance, community engagement, and policy support to harness the full potential of urban agriculture as a cornerstone of sustainable urban development.

KEYWORDS: *Urban agriculture, food security, entrepreneurial strategies, sustainable food system*

Introduction

The term "urban agriculture" describes farming methods used in urban and peri-urban regions. Transitioning from rural land uses, such as farming or raising livestock, to urban ones, including the built environment, manufacturing, services, and utilities, are known as peri-urban zones (Ramanath, 2022). In recent years, the area of urban agriculture has gained more development and attention, with a significant portion of the literature discussing whether urban agriculture could help solve environmental problems and food insecurity. Nevertheless, not much research has looked at the many sustainability claims made by urban agricultural systems, particularly for urban farms meant for higher output and commercial purposes (Milestad et al., 2024).

According to the 1996 World Food Summit, "food security is achieved when all people, at all times, have physical and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life." The four primary characteristics of this definition are "food utilization," "economic and physical access to food," "physical availability of food," and "the stability of the other three dimensions over time." This suggests that the concept of food security is multifaceted and impacted by a variety of circumstances. Although one of the elements that undermines the aspects of food security is urbanization, urban agriculture.

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Asia and Africa are anticipated to have the most considerable urban population growth by approximately 2.8 billion and 824 million, respectively, by 2030 (FAOSTAT, 2019). Likewise, the urban population in most developing countries (including India) is growing at an increasing frequency, whereas the reverse is exact of the rural population (Crush and Frayne, 2011). India, on the one hand, has rapidly grown in urban population from 31% since 2011 and is expected to increase by 34% in 2030 (FAOSTAT, 2019; Singh and Singh, 2020). Specifically, the second-highest growth rate of the population is expected to be in Bihar (55.4%) in India (Singh and Singh, 2020). The swift changes in the urban and rural population of most countries in Africa and Asia have led to a growth in urban food insecurity as well as increasing levels of poverty and other social challenges (Crush and Frayne, 2011). At the same time, an urban agribusiness opportunity has arisen due to the high demand for agricultural produce in cities.

Urban agriculture is perceived to be a crucial strategy to curtail food insecurity in urban areas and cities by several international organisations, researchers and practitioners. Urban agriculture is increasingly being adopted in cities worldwide by urban local bodies (ULBs), entrepreneurs, non-governmental organisations, community groups, and citizens. Indeed, as per the United Nations' Food and Agricultural Organization, urban and peri-urban agriculture have a significant role in global food and nutritional security, and so it is seeking to encourage such activities through the Urban Food Agenda.

The importance of urban agriculture

According to Marzban, et al, 2024 following are the importance of urban agriculture.

Social effects: Socially, "urban agriculture" brings families and communities together and increases food security by making individuals independent and autonomous (Hallett et al., 2016, Petit-Boix and Apul, 2018).

Environmental effects: From an environmental point of view, this type of agriculture makes the city's environment green, cleans the air, and purifies rainwater. Due to its organic nature (no use of chemical inputs), the amount of greenhouse gases in these farms is much lower than industrial agriculture (Hallett et al., 2016, Streiffeler, 1987).

Economic effects: Some consider urban agriculture to be at best a recreational activity with the function of beautifying urban spaces, while urban agriculture is a very important economic activity that associated with the lives of tens of millions of people around the world (Malekinejad et al., 2020). In fact, urban agriculture is a growing industry using intensive production methods, reusing natural resources and urban waste, and breeding diverse animal and plant species, while improving food security and health. In addition, such agriculture helps to improve the livelihood and environment of the individual, family, and society as a whole (Hallett et al., 2016).

Reducing food distance is another effect; it is the distance that a food product travels from the place of production to the place of consumption (Kirby et al., 2021). The most important environmental degradation factors in food distance are packaging and fuel consumption to keep food cool and transport it. Because locally produced food requires less transportation and refrigeration, they can provide a close market with competitive prices and fresh and nutritious products (food safety axes) (Zasada, 2011).

Healthy effects: From a health point of view, urban agriculture facilitates access to fresh food with high food quality- an effective option to combat hunger. Urban farmers also enjoy healthy, low-cost sports, and spending time in the green space (Hallett et al., 2016, Zasada, 2011).

Urban Agriculture Entrepreneurship

Urban agriculture has numerous roles and purposes, according to studies conducted over the last two decades, and plays an important role in improving food security, nutrition, and health in cities; establishing urban job possibilities; and generating revenue, particularly for urban poor populations (Van Veenhuizen, 2006). Because urban agriculture has a market for its products and requires little initial investment, it can be seen as successful and significant. Many times, urban agriculture uses limited, underused space rather than a huge area, which reduces startup and maintenance costs. Urban agriculture may be advantageous for business development and entrepreneurship since it requires infrastructure like roofs, balconies, urban land preparation, and the creation of service provider companies (Saeid, et al, 2015). The FAO defines urban agriculture as a variety of household and agricultural activities that promote entrepreneurship, income, and food security if it is properly understood. Urban agriculture can be considered a substantial and successful business because it requires little initial investment and provides a market for sale. As urban agriculture needs infrastructure like preparing urban lands, roofs, balconies, and establishing service provider organizations, it could be useful in business development and entrepreneurship.

Entrepreneurial Strategies for sustainable food systems

Backyard or balcony cultivation: To augment their meals, reduce food expenses, and generate additional revenue, households in numerous Asian, Middle Eastern, and North African nations cultivate fresh vegetables on their rooftops and spacious balconies.

The majority of the time, basic equipment and amenities such as pottery pots, buckets, boxes, shelves, tables covered in dirt, soil, and compost mixture or additional plant-growing conditions that are appropriate. The government of several nations funds these initiatives (RUAF Foundation, 2006).

A participatory garden: It is one created by a group of neighbors and friends to cultivate flowers and vegetables and offer chances for recreational activities and social interactions.

These gardens were created with a number of objectives in mind, such as revitalizing underutilized urban areas, environmental sustainability, more urban biodiversity, enhanced carbon trapping through tree planting, and regional food production initiatives (McDougall et al., 2019).

A greenhouse: It is a small enclosure that can regulate the environmental conditions for plants to grow from various locations all year round. This definition provides the required climatic conditions for a given product, including the greenhouse's performance (R Shamshiri et al., 2018).

Green roof: It is a unique form of urban agriculture that also helps manage and control urban flooding, green roofs enhance the ratio of infiltration to runoff in order to decrease surface runoff (Whittinghill and Rowe, 2012). According to Walters and Stoelzle Midden (2018), green roofs are the best way to stop urban runoff caused by impermeable levels.

Green Wall: A free or standing wall that is entirely or partially covered with flora is known as a "green wall." Both inner and exterior wall space are utilized for the development of food and ornamental plants. The household and urban environments are made more beautiful by this technique (Ackerman et al., 2014).

Vertical farms: Known as urban farming, vertical farming involves growing crops in skyscrapers or establishing areas in which the plants are enmeshed in. Similar to glass greenhouses, the contemporary concept of vertical agriculture makes use of a system that allows natural sunlight to enhance artificial light levels (Besthorn, 2013). In hundreds of kilometers of disease- and drought-prone terrain, vertical farms aim to avoid natural issues in food production (Despommier, 2013).

Strategies to support Entrepreneurs for sustainable food system with respect to urban agriculture

Tech-Enabled Marketplaces: Creating apps or platforms that connect urban farmers with local consumers, restaurants, and retailers. It reduces middlemen and enhances accessibility to fresh produce.

Agri-Tourism and Educational Programs: Hosting workshops, farm tours, and educational programs to engage the community to increase the awareness of sustainable food practices and generates additional income stream. It can be done by collaborating with schools and organizations for outreach.

Policy Advocacy and Public-Private Partnership: Advocating for policies that support urban agriculture, such as zoning laws and tax incentives. This reduces barriers for urban farmers and encourages investment. This can be done by collaborating with municipal governments and private investors.

Decentralized Food Distribution Systems: Creating networks of small urban farms to collectively supply local markets. This results in increase in food security and reducing reliance on large supply chains.

Climate Adaptation Techniques: Employing techniques like aquaponics, rainwater harvesting, and energy-efficient practices that enhances resilience to climate impacts and reduces operational costs. This can be possible by integrating renewable energy sources and climate modeling tools.

Technical Assistance: The tech firms can provide technical assistance to emerging entrepreneurs by providing technical solutions. E.g. To assist cities in analyzing and strengthening their local food capabilities, a new service can be designed through which site-specific and scale-specific data and modelling can transform a city's piecemeal farming community into a diversified urban agriculture economy.

Seminars/conferences/workshops: In addition to the needs on the entrepreneurship side, it also became readily apparent that the urban farming industry is siloed and frequently disconnected from the outside world. To address this, we have created workshops and conferences that focus on bringing people of diverse backgrounds together and introducing urban agriculture to a wider audience than just ag-tech entrepreneurs.

Conclusion:

Urban agriculture emerges as a transformative solution to the intertwined challenges of food insecurity, environmental sustainability, and urbanization. Its social, environmental, economic, and health benefits make it a critical component of urban food systems. Through entrepreneurial strategies such as decentralized food distribution, agri-tourism, and innovative farming techniques like green roofs and vertical farming, urban agriculture demonstrates its capacity to provide fresh, nutritious food while fostering economic growth and reducing ecological footprints.

To realize its full potential, it is essential to integrate urban agriculture into city planning and development frameworks. This requires strong policy support, public-private collaborations, and investments in education and technical infrastructure. By empowering entrepreneurs, fostering community participation, and leveraging advanced technologies, urban agriculture can not only mitigate urban food insecurity but also contribute to sustainable urban development. Future research and practice should focus on scaling successful models, addressing operational challenges, and fostering resilience in the face of climate change, thereby positioning urban agriculture as a keystone in sustainable food systems globally.

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