

Impact of Urban Farming in Agriculture

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Abstract

In the last 10 to 15 years, an innovative type of farmer has emerged who is eager to cultivate and sell food, whether by extending existing urban farms or revitalizing abandoned ones. Some of these farmers choose this alternative because they cannot access rural farms due to high land costs or a lack of adequate land. An emerging trend in locally grown food and community resilience puts urban farming at its forefront. A comprehensive search was conducted to identify significant peer-reviewed studies. The study found that the legalisation of urban agriculture is the most crucial step towards securing land for the urban poor. In order to bridge the governance void produced by the illegal status policies should be devised, and routine institutionalised management should be done in a participatory manner. Urban farms can contribute to positive social change by means of strengthening food access and visibility in low-income areas, as well as increasing consumer awareness of the necessity of growing fresh food.

Keyword: Urban farming, Urban agriculture, Sustainable agriculture, Urban food, Urban resilience and sustainability

Introduction

Today humans deal with a wide range of environmental issues. A complex set of future challenges, including transportation of people and goods (i.e. excessive carbon emissions), the need for significant rainfall absorption, high levels of air pollution, the urban heat island effect, drinking water supply, waste management, and a lack of biodiversity are some aggravated by concentration of the populations in the cities which eventually causes illness and stress syndromes in the population. Urban agriculture has the potential to mitigate several of these negative effects and thus improve city livelihoods (Skar *et al.*, 2020). Urban agriculture is "a permanent and dynamic component of the urban socioeconomic and ecological system, utilizing conventional urban resources, competing for land and water with other urban functions, driven by urban policies and plans, and contributing to urban social and economic growth." As a result, urban agriculture encompasses more than just growing food in urban areas; it also involves the economic, social, ecological, and physical infrastructure elements of urban environments. There are different urban agriculture typologies such as backyard gardens, urban gardens, community gardens, educational and institutional gardens, vertical and indoor farming systems, aquaponics, and hydroponics (Dona *et al.*, 2021). Urban agriculture contributes to increased subjective well-being, population health improvement, social inclusion, and food security. Urban agriculture, from a planning perspective, is a valuable resource for urban regeneration (Tapia, 2021).

In 1890s, the Potato Patch initiative was started by officials in Detroit, Michigan, to encourage individuals to develop urban gardens and temporarily farm land on empty lots. The American government encouraged families and students to grow victory gardens during the war to add fresh produce to their meals. During the Industrial Revolution, the government provided allotment gardens to workers in England to grow food, a practice that is still used today (DiDomenica *et al.*, 2016).

The top five most influential countries are the United States, Germany, the United Kingdom, Italy, and China, with the United States playing a central role in the cooperative linkage between countries. The University of Kassel, the Chinese Academy of Sciences, and the University of Freiburg are the most influential research institutions in the field of urban agriculture (Yan D, Liu X and Zhang M, 2022).

In India, a country that is primarily based on agriculture has long practiced urban farming which has its root in the management of domestic kitchen waste. In light of this, we can see that there is enormous farming potential. In Indian cities, where urban farming is still in its developing stage, it is distinguished by a high level of professionalism and a well-organized method of cultivation which is obviously a projection surface, representing the communities' concern for the environment. Despite its apparent simplicity, urban farming has a variety of effects on a community as it has various environmental benefits, provides food security, even the city form is altered and city dwellers become more socially aware and active. As a result, we believe that great agricultural potential exists just beneath the surface (Agarwal and Sinha, 2017).

With increasing urbanization of India's population it is essential to prioritize UA in order to increase food and nutritional security. The urban poor will be protected by food self-sufficiency from the erratic food supply brought on by variations in the price of food, the price of oil, and other factors. The Food and Agricultural Organisation has highlighted the importance of urban agriculture in reaching true efficiencies by making efficient use of under-utilized resources and increased farming methods (FAO, 2001). In response to concern about global food security and population growth, growing food for human consumption in cities may be one way to increase the world food supply (McDougall *et al.*, 2018).

The term urban agriculture was coined to characterize the raising of both plants and animals for domestic consumption and revenue creation in cities. The production and sale of agricultural inputs, as well as the management and marketing of agricultural produce after harvest, are additional connected activities that are included in urban agriculture. Urban agriculture improves city air quality, biodiversity, and waste generation while reducing the environmental impact of food storage and transportation. The most competitive subset of urban farming is urban horticulture due to expensive urban lands and requirement of high water- and fertilizer-use efficiency (Orsini *et al.*, 2014).

Urban agriculture can be quite productive because it has advantages over industrial agriculture in terms of crops grown with little synthetic inputs and intended for local consumption. Globally, food produced on a small scale and close to urban areas contributes significantly to global food production. This farming style is likely to be very beneficial for some ecosystem functions, such as promoting healthy soils (Nichollas *et al.* 2020).

The availability of land for cultivation is the fundamental problem with urban agriculture. It is impractical to set aside land for agricultural use in rapidly expanding major cities because there is no more available free space. Even where there is some free land available, the price may be so exorbitant that individuals will not be able to purchase the property for farming (Venkataraman, 2013).

Urban farming involves cultivating annual and tree crops, raising small livestock, and fishing for personal use or sale in small to medium-sized urban settings. Community-based gardening can be done in vacant lots, backyard gardens, verges, balconies, roof tops, fishponds, school gardens, open areas, road strips, along railroads, beneath power lines, on river banks, and in rivers (Food and Agriculture Organization of the United Nations, Rome, 2001). Urban Agriculture needs inter sectorial co-ordination of current financial flows much more than major new funding (Mougeot, 2000). The study will focused on the following objectives:

1. To study the effectiveness of Urban Framing in agriculture.
2. To find out the constraints involved in the development of Urban Framing.

Research Methodology

The study is based on a systematic review of past literature. The secondary data in this study refers to the information that is used to answer research questions other than the ones that the original data collector set out to answer (Vartanian, 2011). The secondary data search was guided by phrases such as urban agricultural practices, social, economic and environmental benefits and constraints of urban farming. The review is based on papers that have been peer-reviewed and published in international scientific journals such as Google Scholar, Taylor and Francis, Elsevier, Springer, Microsoft Academia. We have included the published papers from the year 1999 to 2022. A search of significant aspects is conducted in the categories which include title, key words, objective of paper to find relevant papers. The focus of review is on effectiveness of urban farming in agriculture and constraints involved in urban faming. Articles that evidently did not fulfill the requirements for consideration were sorted out by the titles and abstracts then carefully examined each full text article to see if it matched the requirements for inclusion. At the end of the research, we used 31 articles, reports, books on urban agriculture and sustainable cities.

Sr.No	Author Name	Title of Research Paper	Journal Name	Year
1	Quon S	Planning for Urban Agriculture: A Review of Tools and Strategies for Urban Planners	<i>International Development Research Centre</i>	1999
2	Bryld E	Potentials, Problems, and Policy Implications for Urban Agriculture in Developing Countries	<i>Agriculture and Human Values</i>	2003
3	Morgan K	Feeding the City: The Challenge of Urban Food Planning	<i>International Planning Studies</i>	2009
	Yanhang L and Rui Z	Ecological Agriculture Technology in Urban Agriculture	<i>Advanced Materials Research</i>	2011
4	Dorward C and Mullinix K	<i>The Economics of Urban Farming Guidebook II.</i> Chapter Six	EcoDesign Resource Society, North Saanich	2013
5	Orsini F <i>et al.</i>	Urban agriculture in the developing world: A Review	<i>Agronomy for Sustainable Development</i>	2013

6	Stewart R <i>et al</i>	What are the Impacts of Urban Agriculture Programs on Food Security in Low and Middle-Income Countries.	<i>Environmental Evidence</i>	2013
7	Venkataraman M	Analysing Urban Growth Boundary Effects in the City of Bengaluru. Indian Institute of Management Bangalore Bannerghatta Road, Bangalore	<i>Working Paper No: 464</i>	2013
8	Badami M G and Ramankutty N	Urban agriculture and food security: A critique based on an assessment of urban land constraints	<i>Global Food Security</i>	2014
9	Martellozzo F <i>et al.</i>	Urban Agriculture a Global Analysis of the Space Constraint to meet Urban Vegetable Demand	<i>Environmental Research Letters</i>	2014
10	Rogus S and Dimitri C	Agriculture in Urban and Peri-Urban Areas in the United States: Highlights from the Census of Agriculture	<i>Renewable Agriculture and Food Systems</i>	2014
11	Surls R <i>et al</i>	Gearing up to Support Urban Farming in California: Preliminary results of a needs Assessment	<i>Renewable Agriculture and Food Systems</i>	2014
12	Didomenica B and Gordon M	Food Policy: Urban Farming as a Supplemental Food Source	<i>Journal of Social Change</i>	2016
13	Sahasranaman M	Future of Urban Agriculture in India. Institute for Resource Analysis and Policy	<i>Occasional Paper No.10-1216</i>	2016
14	Aggrawal H and Sinha R	Urban Farming - A Sustainable Model for Indian Cities	<i>International Journal on Emerging Tec</i>	2017
15	McDougall R, Kristiansen P and Rader R	Small-Scale Urban Agriculture results in High Yields but Requires Judicious Management of Inputs to Achieve Sustainability	Proceedings of the National Academy of Sciences. <i>University of New England, Armidale, NSW 2351, Australia</i>	2018
16	Tuijl E, Hospers G and Berg L.	Opportunities and challenges of urban agriculture for sustainable city development	<i>European Spatial Research and Policy</i>	2018
17	Audate P P <i>et al.</i>	Scoping review of the	<i>BMC Public Health</i>	2019

		impacts of urban agriculture on the determinants of health.		
18	Gonfa L	The Role of Urban Agriculture in Economic, Social and Environmental Sustainability in Africa	<i>Journal of Natural Sciences Research</i>	2019
19	Nicholls E <i>et al.</i>	The Contribution of Small-Scale Food Production in Urban Areas to the Sustainable Development Goals a Review and Case Study	<i>Sustainability Science</i>	2019
20	Salim S A <i>et al.</i>	Urban Farming Activities in Southeast Asia: A Review and Future Research Direction.	<i>MATEC Web of Conferences</i>	2019
21	Grebitus C, Chenarides L, Muenich R and Mahalov A	Consumers' Perception of Urban Farming- An Exploratory Study	<i>Frontier in Sustainable Food System</i>	2020
22	Muhammad R M	Impact of urban farming technology on urban community in Malaysia	<i>Economic and Technology Management Review</i>	2020
23	Nafisi N <i>et al.</i>	Effectiveness of Urban Farming Program in Providing Multiple Benefits to the Urban Community in Malaysia	<i>Journal of Architectural Environment & Structural Engineering Research</i>	2020
24	Nandwani D and Akaeze O	Urban agriculture in Asia to meet the food production challenges of urbanization: A review	<i>Urban Agriculture & Regional Food Systems</i>	2020
25	Pinheiro A and Govind M	Emerging Global Trends in Urban Agriculture Research: A Scientometric Analysis of Peer-reviewed Journals	<i>Journal of Scientometric Research</i>	2020
26	Skar S I <i>et al.</i>	Urban Agriculture as a Keystone Contribution Towards Securing Sustainable and Healthy Development for Cities in the Future	<i>Blue-Green Systems</i>	2020
27	Davies J <i>et al.</i>	Barriers to urban agriculture in Sub-Saharan Africa	<i>Food policy</i>	2021
28	Dona C G W, Mohan G and	Promoting Urban Agriculture and Its Opportunities and	<i>Sustainability</i>	2021

	Fukushi K	Challenges- A Global Review		
29	Tapia C	Monitoring the contribution of urban agriculture to urban sustainability: An indicator-based framework.	<i>Sustainable Cities and Society</i>	2021
30	Ilieva R T <i>et al.</i>	The Socio-Cultural Benefits of Urban Agriculture: A Review of the Literature	<i>Land</i>	2022
31	Yan D <i>et al.</i>	Global Trends in Urban Agriculture Research: A Pathway toward Urban Resilience and Sustainability	<i>Land</i>	2022

Result and Discussion

1. To study the effectiveness of Urban Framing in agriculture.

The most often mentioned benefits included under urban farming is that it contributes to food security and nutrition, enhance access to fresh or healthier foods, build social capital, develop cultural linkages, encourage education, lower food prices, and/or offer a source of income (Audate *et al.* 2019; Kennard, 2020).

Urban farming plays a key role in recycling urban waste which is streaming from commercial locations, roadways, residential areas, schools, and animals. The reutilization of mentioned wastes for fertilization involves removal or disposal of municipal waste, and the application of adding organic fertilizer to the soil or plants which has a diverse influence on attaining food security in cities, creating jobs, enhancing the environment, and maintaining the health of urban populations as it is a form of energy recovery (Tefera, 2010; Yanhang and Rui, 2011; Dorward and Schutzbank, 2013).

Urban agriculture minimizes food insecurity and improves nutritional health by increasing the availability and consumption of fresh fruits and vegetables, which in turn reduces obesity and diet-related health disparities (Lovell, 2010).

Urban gardening may help communities achieve economic success as green infrastructure in cities will increase real estate values in their surrounding areas such as urban farms and gardens will assist to reduce urban vandalism. Nonetheless, by locating food production inside metropolitan areas, farmers may provide fresh, healthful food at a moderate cost (Nafisi *et al.* 2020; Foeken and Owuor, 2000).

Urban farming generates innovation and green jobs. Farmers of urban areas with small growing area for producing are developing creative methods for generating great yields and a fair return. Although Innovations practices like aquaponics, vertical farming, micro-green farms, and rooftop greenhouses are still in their early stages, several of these inventions are gaining media attention, support from nearby companies and customers, which is helping to popularize urban farming. Creation of urban agricultural jobs and preparation of training programmes are aspiring farmers to scale up and migrate to larger farms (Dorward and schutzbank, 2013).

The key elements that encourage respondents to implement urban farming community programmes are the components of benefits such as lowering daily expenditures, enhancing the quality of fresh produce, maintaining programme existence and a solution to the lack of sustainability. The use of urban agricultural technology offers the chance to raise living standards, stimulate local economies, have a beneficial effect, and serve as an excellent forum for civic involvement (Muhammad, 2020; Yanhang and Rui, 2011).

2. The constraints involved in the development of Urban Framing

UA has low potential or would be impossible in terms of land availability in urban areas to meet even the modest threshold of growing the daily vegetable intake for the urban poor except in the most optimistic (but also least likely) scenario for example cities in low-income nations have relatively large populations and the majority of destitute population (Badami and Ramankutty, 2014; Sahasranaman, 2016).

The most common challenges encountered by potential or even already established farmers includes high financial and infrastructural requirements to start up, operate and sustain urban agricultural operations. In highly populated urban areas, space constraints lead to zoning laws that may restrict the activities of urban agriculture (Nandwani and Akaeze, 2019).

The primary impediment factors of urban agriculture namely urban development pressures followed by lack of credit or financing opportunities, restricted access to land, low land output as well as an ineffective State-run initiative, such as parastatal marketing organizations targeted agricultural finance schemes and input programmes, program or technical support services for urban agriculture and lack of acknowledgement of urban agricultural planning policy issues. (Quon, 1999; Gonfa, 2019).

The primary challenges for urban farmers and gardeners were restricted access to land, lack of education, low land output, animal grazing on crops, and agricultural commodities theft, difficulties acquiring funding and high interest rates. An ineffective State-run initiative, such as parastatal marketing organizations targeted agricultural finance schemes and input programmes (Gonfa, 2019).

For many residents, it is a crucial advancement in the effort to increase urban food security. As a result of the increase in household nutrition and economic stability, it has become a crucial component of household survival strategies in metropolitan regions of developing nations. Additionally, urban agriculture has the potential to enhance the environment through greening and nutrient recycling. There are a number of connected issues as a result of urban agriculture being prohibited in the majority of developing nations. The most visible are the growing food shortages in the big cities, which are harder to address when the city's wide spaces cannot be exploited for farming. This leaves urban producers with a variety of issues, including cutting and theft as well as gatekeeping and land exploitation (Bryld, 2003).

Policies that prohibit urban agriculture or unintentionally separate urban food producers and consumers limit the amount of food security assistance that may be supplied in certain residential areas (Davies, 2021).

Research showed that farms near railroads, highways, and industrial areas may be polluted by heavy metals including lead, sulphur, and nitrate. These dangerous substances will be carried to farms and result in a large number of illnesses (Salim, 2018; Eigenbrod and Gruda, 2015).

Conclusion

Urban agriculture presents a promising opportunity to bring fresh produce to urban residents close at hand. By addressing consumers' preference for local foods, this could improve dietary quality and food diversity. However, urban agriculture won't be successful unless local residents support it and have a favorable opinion of it. As a result, consumer perception must be taken into account. Urban agriculture has the potential to improve urban life as its significant advantage is utilizing the city's organic waste. It contributes to the preservation of natural resources and an ability to turn waste from a problem into a resource. As a result, it is

clear that urban farming can be sustained if it preserves environmental integrity, is economically sound, promotes social well-being, and is supported by favorable government policies.

Urban agriculture positively contributes to the food security that helps in fighting poverty and hunger. Urban agriculture can help every household combat the food crisis by generating income and providing wholesome food. Additionally, it gives every household the opportunity to produce their own food and makes it simpler for them to access a high-quality diet. It is therefore necessary to develop new breakthroughs in this field in order to increase urban agriculture's role and contribution, both in developed and developing countries.

Future studies should look into the labour economics problems that are present and ways to use recycled materials more frequently in urban agriculture systems to make those systems more sustainable. There are few drawbacks in the growth of urban agriculture but if done correctly, the practice can be carried out with very little environmental impact and expense.

Suggestions

This study emphasizes the significance of incorporating urban agriculture into agricultural and urban development plans in light of the sustainability potential of urban agriculture (Pineiro and Govind, 2020). Reviewed paper identified three significant gaps in information about urban agriculture that planning researchers could fill. First, a thorough regulatory typology is required, supplemented by real regulations and information on how they are applied, interpreted, or enforced, as well as an explanation of how they help or hinder urban agriculture operations. An evolving typology of this kind may be a responsive document that adapts to new regulatory developments (Meenar, 2017).

The success of establishing the urban farming community programmes is not a short time effort. It demands a comprehensive strategy from the government, the implementing agencies and the community awareness towards further enhancing national food sovereignty, whether in the present or in the future (Muhammad, 2020).

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