

Urban and Peri-Urban Farming: Some Insights from a Developed Nation

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ABSTRACT

Rapid urbanisation is prominent in various parts of the world. This is an evident outcome of the overgrowing world population, and it also threatens the future food production system. This world needs more and more food items to feed its habitants. But unfortunately, food production does not show a directly proportional relation with the phenomenon of rapid urbanisation. It compels the scientists to think more about the urban and Peri-Urban Agriculture (UPA). UPA is getting much more attention nowadays, as it allows to grow the food items in urban as well as peri-urban areas. The main objective of this paper is to provide an overview of the UPA, including the possible existing barriers and challenges. There are the several ways to grow food items through UPA, but most of the available academic literatures did not focus significantly on the different existing barriers of this UPA. In this paper, the possible barriers of UPA have been divulged through the unstructured literature review of a bunch of previous excellent studies on UPA in the United States, alongside the different UPA project types as well as approaches. Lack of clear agri-inclusive ordinances is a valid problem towards implementing UPA, alongside zoning difficulties and limited access to land. The growing expenditures of the farmers as a part of UPA farming is also an issue or concern which rather exacerbated with no/very low funding opportunities. Reluctance of the farmers in attending the various farmers' training program is also a barrier here alongside the difficulty of the certification system. Smooth accessibility to the irrigation water and also the management strategy for the water run-off are the challenging tasks as indicated by urban farmers & planners. Insurance coverage is very limited in case of UPA which is also one of the solid challenges as faced by urban growers.

Keywords: Urbanisation, Urban Agriculture, Peri-Urban Agriculture.

Introduction

The growing population is indicated as the primary cause behind that phenomenon and such an explosive population is threatening the issue of food security as well. Food & Agricultural Organisation (FAO) has indicated a growing concern about the increasing urban population and the food security of urban

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dwellers in the next few decades. It has been predicted that the world's urban population will increase by 60% by the year 2050 and that suggests an absolute increase of 2.5 billion people (UNDESA/PD, 2013). In this context of growing urban poverty and food shortages, the urban and peri-urban agriculture (UPA) is getting much scholastic attention these days. As per the US Department of Food & Agriculture (USDA), urban agriculture is to establish and perform an agricultural practice in or near the urban space or a city-like setting. As per the concept of the United Nations, urban and peri-urban farming is the kind of farming activities in and around the cities that compete with various other activities for necessary resources such as water, land or energy (FAO, 1999).

Urban farming can also be defined as the production of food crops and rearing the livestock to feeding the local population (Goldstein et al., 2011; Castillo et al., 2013). This concept of urban agriculture can be linked with the notion of existing market and it can be said that an urban farm grows food items to sell those products to consumers, either commercial or non-profit with the help of their license. So, it is basically the organized agricultural activity within the city or at the periphery of the city sponsored by a public body, non-profit or private organisations (Hodgson et al., 2011; Oberholtzer et al., 2016). Urban agriculture not only addresses the issue of food insecurity, but it also helps to build up a local and regional food systems, address food waste reduction, community building and also the creation of new green space in cities (Goldstein et al., 2011; Heimlich, 2001). Commercial Urban Agriculture (CUA) also enhances the property values in the urban spaces which plays a role in financial advantages.

Urban farming is a vital component of the larger community food system. It acts as an important tool for providing nutritional security to the population, creating green spaces, generating new economic opportunities as well as making urban environment much more resilient. The main focus of urban farming is on the production of local food system and fill the existing gap in the food supply (Hodgson et al., 2011). The community-based food production system is associated with urban and peri-urban farming and that duly emphasizes the regional food component from the food supply standpoint (Horst et al., 2017).

Moreover, there is a regular discussion about the Sustainable Developmental Goals (SDGs) of the United Nations in every global forum and the 11th SDG indicate the notion of establishment of the more resilient, inclusive and sustainable cities. To address the issue of rural migration, nutritional security judged from the supply the side as well as fulfilling the 11th SDG, some of the developed countries like USA have implemented the UPA in different metropolitan areas of the country quite successfully. So, analysis of the UPA scenario of various urban areas of the United States can reveal the multifarious

aspects of the UPA implementation and also allow the Agri-experts to identify the existing difficulties as faced the urban farmers & planners, particularly in the context of a developed nation. It will provide support to the urban planners of the growing urban spaces in developing countries as well as policy makers to figure out a concrete blueprint of the installation plan of urban and peri-urban farming.

Methodology

This paper is a comprehensive review of a bunch of the previous research studies performed in the domain of urban & peri-urban farming system, particularly in the context of developed countries like USA. This paper illuminates the multiple aspects of urban and peri-urban farming, including the different barriers as faced by urban farmers & planners during the implementation of that in the urban areas of the United States. This paper was prepared through the process of unstructured literature review and the finding as well as analyses from the various popular previous study reports on UPA were identified, analysed, screened and compiled briefly. A brief analysis of urban & peri-urban farming was performed throughout this study, particularly focussing on the various existing & identified barriers.

This study, being a review study, did not use any specific kind of statistical tools and applications like the quantitative research studies. No primary data has been collected and gathered as a part of this study. As it is a purely review-based study, it sets an objective of exploring the various types of urban farming and also the benefits of that towards various stakeholders. It also tried to set another objective to explore the different identified barriers of urban and peri-urban agriculture from the farmer's & planners' standpoints. The overarching goal of this research article is to sketch a broad scenario of the urban and peri-urban farming briefly and also to put together a list of suggestions as well recommendations as in regards to the implementation of UPA in developing countries like India. This study will allow novice urban farmers and urban farm planners a brief but transparent idea about urban & peri-urban agriculture, and the various barriers faced by the stakeholders during the implementation or installation process.

Results and Discussions

It is well established by the various findings, facts and data that the overall scenario of urban & peri-urban farming has changed significantly across United States as well as in other developed parts of the world. Base on the detailed analysis of the various academic and scientific literatures, it was observed that most of the respondents from the different American cities (including the

farmers & farm planners) indicated a sharp increase in the growth of urban and peri-urban agriculture in last 10 years (Rogus & Dimitri, 2014; Reynolds, 2011). There was an increase in acreage in various urban spaces particularly in the southern part of the United States from one to 71 acres (i.e., 28.4 hectares), with a median increase of 7 acres (Fricano & Davis, 2020). Almost 70% of the Southern cities responded a thorough increase in urban agriculture which can be used to infer that there is a growth of urban farming activities (Goldstein et al., 2011; Fricano & Davis, 2020).

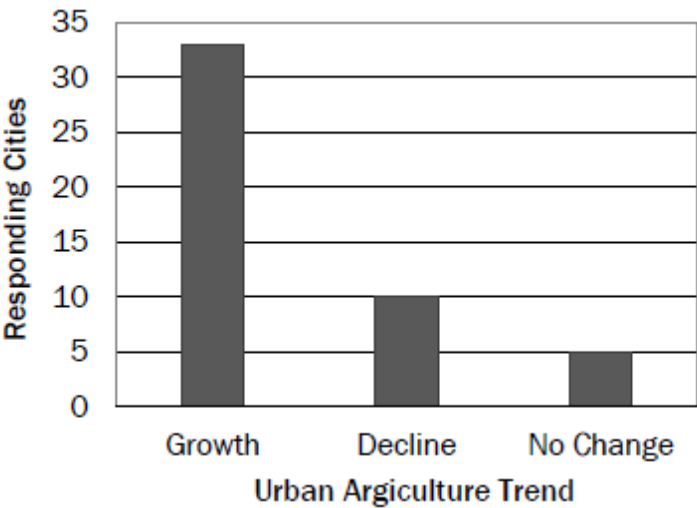


Fig. 1 Trend of Urban Agriculture in the Southern USA in the last 10 years (Fricano & Davis, 2020)

It was also found in several surveys that there are a range of types of urban farming projects as implemented by the urban farm growers in various cities of the United States. It ranges from the Community or Neighbourhood garden to the ranching areas for domestic cattle or other animals. The secondary data analysis suggested that the Community/Neighbourhood garden is the most numerous type of urban farming project as it has been implemented in most of the responding cities, followed by school gardens and different community supported agriculture projects (ACGA, 1998; Lawson & Drake, 2012; Oberholtzer et al., 2016; Fricano & Davis, 2020). Table 1 provides a comprehensive view of the various types of urban farming projects and their degree of implementation in various American cities. Table 1. Urban Agriculture Project Types and Table 1.

Table 1. Urban Agriculture Project Types and Preference Ranking

S. No.	Parameters	Duration of vermicomposting			
		0 days	15 days	45 days	75 days
1.	pH	9.32	9.22	8.9	8.37
2.	Organic carbon (%)	7.25	5.265	5.078	3.696
3.	Total nitrogen (%)	0.241	0.301	0.361	0.771
4.	Available phosphorus (%)	0.110	0.12	0.16	0.18
5.	Exchangeable potassium (%)	0.0086	0.132	0.196	0.386
6.	C:N ratio	30.08	17.49	14.06	4.79
7.	Organic matter (%)	12.499	9.076	8.754	6.371

(Source: Fricano & Davis, 2020)

So, it is quite evident from the existing literatures that the urban farming in the developed world, particularly in the United States is multi-dimensional as it does appear in many different forms and also in different places. The urban farms are located on the grounds or the rooftop, may use greenhouses or not and very interestingly, the food products (e.g., vegetables, fruits, flowers etc.) are grown on the soils or without using the soils (i.e., using hydroponics technique) (Kaufman & Bailkey, 2000; Rogus & Dimitri, 2013). Urban agriculture policy also plays a role in projecting as well as implementing urban farming successfully. The American cities with evidence of an increasing rate of urban farming in the last few years indicated the consideration of UPA in their land-use policy maps, comprehensive plan, and open-space plan quite a lot and also in their neighbourhood plan (Fricano & Davis, 2020). It is always important to consider urban farming in the policy matters to build up a robust strategy regarding its implementation. The local level planning is necessary to grow urban farming as identified in various literatures (Castillo et al., 2013; Fricano & Davis, 2020).

It is always important to consider the various obstacles as well as barriers in implementing the urban agriculture, because that will allow the urban farm planners in the developing countries like India etc. to take the sufficient precautions against those barriers. There are a bunch of factors which act as the barriers towards the growth of urban farming and sometimes become responsible for the decline of the urban & peri-urban farming. These include the issue of land access, lack of credit access, lack of municipal support for composting, lack

of access to the irrigation water, and also a set of regulations regarding city plans, zoning or building code etc. without considering the issue of farming & farm related activities etc (Lovell, 2010; Rogus & Dimitri, 2014). Getting a proper market might become difficult sometimes and it also becomes a problem to gain the proper access to the consumers willing to buy the products and that can cause a decline in urban farming (Thibert, 2012). Many of the urban areas do not possess the necessary processing as well as marketing infrastructure and that affects the long-term viability of urban farm (Kaufman & Bailkey, 2000). It is evident that urban & peri-urban agriculture is a new concept and having the lesser knowledge about that causes difficulty in implementing this kind of farming in the urban space. Most of urban farmers or interest groups perform this kind of farming on an experimental basis using trial & error method.

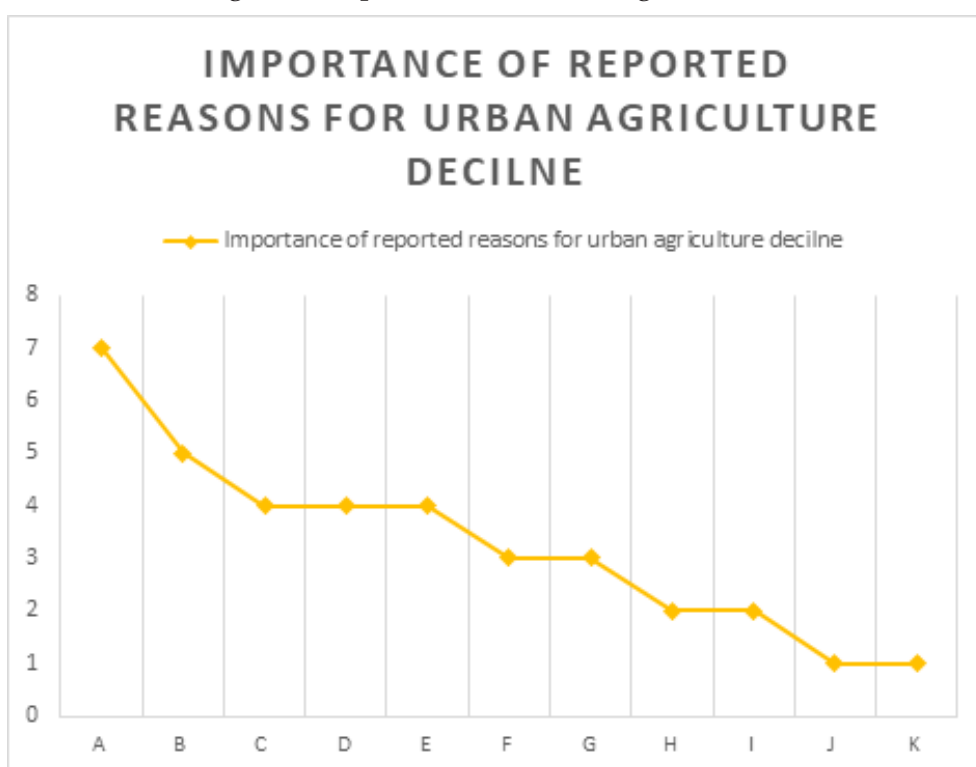


Fig. 2 Various existing causes for urban agriculture decline/barriers in Urban farming with their level of importance
(Source: Fricano & Davis, 2020)

A=Conversion of previously owned land to other uses

B=Failure of site to sustain itself economically

C=Conversion of land for community redevelopment

D=Lack of funding

E=Changing city priorities

F=Conversion of land to parks or recreation facilities

G=Gardeners' lack of interest

H=Vandalism or theft

I=Gentrification

J=Lack of sites

K=Designation of urban growth areas

An important barrier of urban farming as identified in different literature is the lack of clear, agriculture-inclusive ordinances. Unclear and unfriendly ordinances make the farmers uncomfortable about implementing new urban farming operations as they consider these as unregulated activities (Heimlich, 2001; Hodgson et al., 2011; Castillo et al., 2013). Urban farming communities rather expect to have transparent as well as farmers' friendly ordinances about all agricultural activities and infrastructure development starting from creating a proper market to building greenhouses etc. Different evidences suggest that the farmers rely on an ordinance if that eventually protects the rights of the local food production (Castillo et al., 2013). Zoning was identified as one of the most significant barriers to implementing urban agriculture in a larger and commercial scale (Castillo et al., 2013; Covert & Morales, 2014). Restrictions on land usage is a common phenomenon in large cities and metropolitan areas and that's why, urban farmers confront with a bunch of legal obstacles while scaling up their farming activities. Some farmers have even identified zoning as the biggest problem as they do not get sufficient land for the farming. It is a common complaint that the zoning code in the urban spaces does not consider urban agriculture as a significant land use option (Goldstein et al., 2011; Castillo et al., 2013). Without the zoning code, the farmers need to apply for a special permit which is of course a burdensome task and that also does not ensure security like the specific zoning code. The special permit allows urban farmers to continue the UPA with much uncertainty.

Access to sufficient land for farming activities is one of the most crucial barriers as indicated in various previous surveys and scientific literature. Many farmers in the urban areas do not possess their land which eventually creates hardships for them to continue their farming jobs. Moreover, the growing population

in the urban metropolitan areas is insisting the urban planners construct the various infrastructure and that is causing sorts of severe shortage of arable land areas for farming (Castillo et al., 2013). High-tech urban farming also becomes a difficult task to do with the constraints of lack of funding. The urban and peri-urban farming seeks more funding and more technical assistance has which become a problem many times (Covert & Morales, 2014). There is a very limited scope of receiving federal subsidy support, and there is a significant difference indicated between the urban farmers and the rural crop growers in receiving government support for the farming activities (Erickson, nd).

The farmers in the urban areas of the United States face the obstacle of getting the proper certification for growing food items like vegetables etc. Training facilities are not sufficiently available in many urban sites in the USA, but the USDA GAP certification is quite essential for being viable in the farming scenario (Fricano & Davis, 2020). It became more difficult for the organic growers as the organic certification process involves extraneous paperwork and spending a lot of money as a part of the application process. The market becomes inaccessible for urban growers without having proper certification for their profession, and that eventually creates a challenge for the existing urban farm producers (Heimlich, 2001; Horst et al., 2017). Moreover, water management in urban farms was also identified as a barrier in multiple scientific studies. Flooding problem, storm water and the lack of infrastructure to support that sort of problem have become a concern to many urban planners (Bleasdale et al., 2011; Krones & Edelson, 2011). That includes both the water access and water runoff. As farming suffers from various weather hazards quite frequently, it should come under the concern of insurance to protect the interests of the farmers. However finding an authentic company for getting insurance becomes an obstacle many times for urban growers as identified in various surveys. Alongside, paying the insurance premium becomes a problem for many urban farmers who farm on a small scale with a narrow profit margin.

Conclusion

Urban & Peri-Urban Agriculture has put itself in today's discussion at different global forums. Food & Agricultural Organisations (FAO) been considering this particular type of modern farming (including vertical farming, organic agriculture etc.) in their plan of actions in recent days, the growing urban population in the developing world along with an increasing rate of poverty rather pushes the need of such new ways of farming in the modern world. This paper presents a brief scenario of urban farming in the context of a developing nation, and most importantly identifies some crucial obstacles associated with the UPA. Planners and farmers in the developing world, such as in India can

make a pre-assessment and analysis of these issues and take the necessary actions to promote urban & peri-urban farming. Though the context is different, still novice Indian urban farmers and urban planners can build up an idea about the nature of urban farming alongside the probable hindrances.

Urban and peri-urban farming holds different benefits including ensuring the local food production and maintaining the urban nutritional security. It is hard to get fresh farm produce in the urban sites daily, and UPA can address that issue potentially (Martinez et al., 2010). That solves the problem of malnutrition in the urban children, and also strengthens the local economy. It is recommended to include the UPA in the local comprehensive as well as regional planning of a particular city in India. Urban farming needs to be focused on solving the issues related to land selection and financing. The urban farming community is expected to initiate and execute the farming activities keeping the view of making their operations an enterprise, which would in turn ensure maintain the viability of their farm businesses.

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