



## Multifunctionality of Urban Agriculture: Innovative Trends & Characteristics

Dr. Sreelakshmi.C and Dr. B. Gopichand

*“To manage a city is to attempt to manage something spontaneous. Cities emerge, grow, and evolve as a result of vast numbers of individual decisions about where to live, work, locate a firm, source suppliers, recreate, get educated and so on... It is interconnections that make a city attractive.”*

(Chris Webster, 2006)

### Introduction

Urban Agriculture (UA) can be defined as: ‘Agriculture which is located within (intra-urban) or on the fringe (peri-urban) of a town, a city or a metropolis, and grows or raises, processes and distributes a diversity of food and non-food products, (re-)uses largely human and material resources, products and services found in and around that urban area, and in turn supplies human and material resources, products and services largely to that urban area.’ Urban agriculture receives increasing research attention, and the number of relevant research papers have increased significantly since 2010. As the number of relevant research studies increases, not only the scope of research topics and findings but also the diversity of interpretations of various aspects expands. The definitions of urban agriculture increasingly vary, especially in the context of territorial boundaries, and the

interpretations of the factors, functions and other aspects also tend to vary. In the definition of the United Nations in 1996, urban agriculture is defined very broadly as food production inside of cities, while in the definition of 2015, it is specified not only as agriculture inside of cities, but also near them, thus creating wide interpretations in studies. Similarly, the functions of urban agriculture are often identified for a specific case and regional situation, thereby making it difficult to compare research results. This creates a necessity on the research field to identify and classify aspects for a unified and generalised approach, that is not focused specifically or narrow. Despite the fact that urban agriculture has received increased attention in academic and scientific research in recent decades, there is still a need for deeper, broader work in its theorisation. In addition, urban agriculture has

**Dr. Sreelakshmi. C** -Academic Associate, MANAGE, Hyderabad

**Dr. B. Gopichand** - Consultant, MANAGE, Hyderabad

been studied very little. Although new studies are needed to cover urban agriculture experiences of a wider range of countries, it is also very important to summarise existing results by systematic theoretical reviews, creating a comprehensive identification and classification of aspects. Therefore, this research is structured by a two-step approach and results. First, a systematic theoretical review and applied research was done to identify and classify functions of urban agriculture, regardless of the research scale and the region, thereby identifying the most important functions that are not adapted to an analysis of a specific case.

### **Functions of urban agriculture and their classification:**

The historical development of urban agriculture represents its role in urban planning principles at the beginning of the emergence of cities, the significance of its functions in crisis periods and its new, 21<sup>st</sup>

century's functionality, that incorporates sustainable development principles and lifestyle trends. A combination of several processes, such as public and research interest, change in social values and technological innovations, interacting with the challenges of and barriers to agricultural practices in the urban environment, has determined that urban agriculture develops not only in different ways, influenced by the availability of resources, but also as a multifunctional practice. Even though initially agricultural practice in urban areas involved functions such as food security and autonomy in the 21<sup>st</sup> century it has economic, social and political potential, including functions such as food production and security, creation of a place for socialisation and social inclusion, promotion of public health, emancipation from city life, contact with nature, rest and recreation, educational opportunities (both ways: teaching and learning), diversification of the urban

**Table 1: Functions of urban agriculture**

<i>Political functions</i>	Role of and opportunities for urban agriculture in policy making and development strategies	Support for urban sustainability
		Improvement in urban organic waste
<i>Economic functions</i>	Economic benefits of various scales, including the supply of both food and financial resources	Food security
		Reduction of expenses on food
		Income generation
		Poverty reduction
<i>Social functions</i>	Promotion of physical and psychological health, lifestyle, social trends, values and other social aspects at both the public and individual level	Social cohesion development
		Promotion of public health
		Education
		Maintenance of values and traditions
<i>Environmental functions</i>	Creation of a sustainable urban environment by mitigating risks of urbanisation	Provision of ecosystem services
		Preservation of and improvement in the landscape
<i>Technological functions</i>	Potential of urban agriculture Practices for promoting technological innovations and solutions	Technological innovations
		Increasing the energy efficiency of buildings

landscape, recycling of organic waste, mitigation of the impact of extremely negative sustainability scenarios, reuse of water and parts of waste water, preservation of biodiversity, positive impacts on the climate, better air quality, improvement in the visual image of the city as well as creation of inspiration and positive emotions. The past research has identified 14 functions of urban agriculture and classified them into five groups: political, economic, social, environmental and technological functions.

### **Political functions of urban agriculture:**

Political functions of urban agriculture relate to the *role of and opportunities for urban agriculture in policy making and development strategies*. In implementing political functions, urban agriculture has the potential to support sustainable development, circular economy and waste management strategies and plans.

Already in the 1990s, research on urban agriculture found that even a lack of availability of land resources in urban areas only partially limited the use and usefulness of urban agriculture as a policy and planning tool.

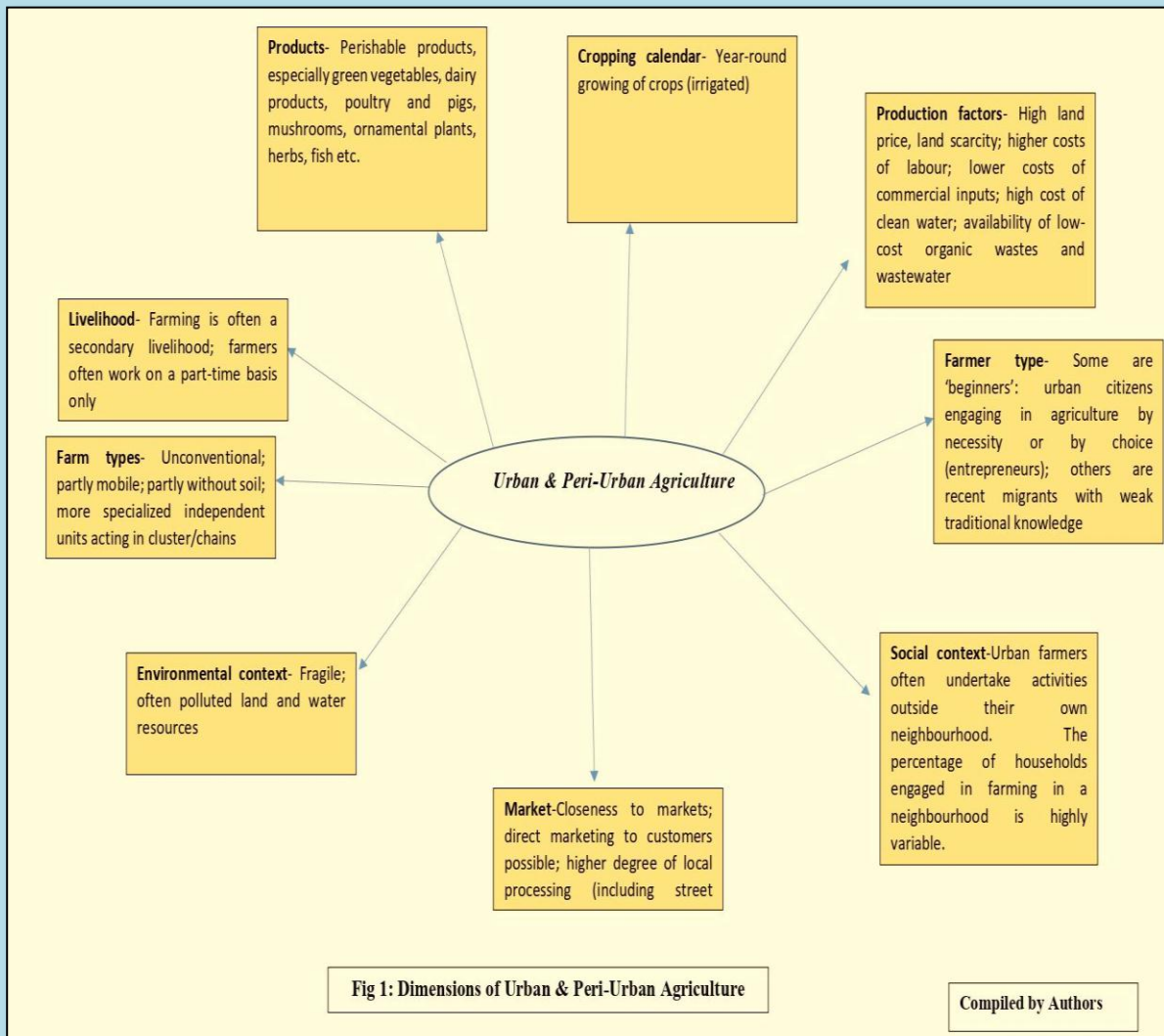
### **Economic functions of urban agriculture:**

Economic functions of urban agriculture are associated with economic benefits of various scales, including the supply of food and financial resources. Even though urban agriculture is difficult to assess in terms of direct financial benefits due to limited

resources and high costs, it provides economic benefits in several ways. On a larger scale, urban agriculture reduces poverty and food insecurity caused by urbanisation, while also improving the health of urban dwellers and the urban environment. An important aspect is also opportunities for business expansion and promotion, especially in the segment of small and medium enterprises, performing the function of income generation. The function of income generation, depending on the size of agricultural activity, could be significant at both the business and the household level. At the household level, economic functions of urban agriculture can be classified into three categories: food production, additional or basic income generation and reduction of expenses on food.

### **Social functions of urban agriculture:**

Social functions of urban agriculture are related to the promotion of physical and psychological health, lifestyle, social trends, values and other social aspects at both the public and the individual level. It is social functions, equivalent to environmental functions, that are among the dominant ones in relation to characteristics of urban agriculture in the 21st century. Urban agriculture contributes to such social aspects as education, civic participation and engagement, gender equality and social equity, health improvement and recreation.



**Environmental functions of urban agriculture:** Both the promotion of urban sustainability and the restoration of traditions and values as well as other functions directly interact with environmental functions of urban agriculture – *creation of a sustainable urban environment and reduction of risks of urbanisation*. They also involve interaction between the environment and society – urban agriculture creates a link between public health and ecosystem health through producing

healthy and sustainable food. The development of various functions is relatively broad in scope under such interaction conditions – urban agriculture contributes to the preservation of the environment and biodiversity, increases the ecological (environmental) awareness of local residents by using their free time in a healthy way that promotes a healthier lifestyle, while at the same time develops cooperation between urban gardens and the city.

**Technological functions of urban agriculture:** Technological functions of urban agriculture are related to its potential for promoting technological innovations and solutions. Considering the cost and limited availability of land in urban areas, in the 21<sup>st</sup> century urban agriculture is characterised by the need for considerable adaptation, seeking innovative and non-traditional approaches to producing agricultural products. As a result of innovation and adaptation in the global experience, urban agriculture has also proved its potential for increasing the energy efficiency of buildings. Therefore, this research identifies two technological functions of urban agriculture:

- technological innovations,
- increasing the energy efficiency of buildings.

### **Innovative trends in Urban Farming through Case Studies:**

In urban production systems, crop production and livestock production tend to be taken up by separate households, and mixed crop-livestock systems tend to be less common than in rural agriculture, especially in intra-urban agriculture. Important linkages are often maintained between (often peri-urban or even rural) crop production systems producing fodder and other feed ingredients and sub- or intra-urban livestock enterprises.

Vagneron *et al.* (2002) identified three main production systems:

- **specialized production systems** devoted to a single crop or animal: rice, vegetables, fruit, fish, shrimp, chicken;
- **mixed production systems**, which combine two activities (two main crops or mixed crop animal);
- **hybrid production systems**, which combine more than two main activities (crops and/or animals).

In United States, Chicago, the following three models were distinguished as most applicable and convenient to use in city planning and advocacy, based on the variables of location, size, type of management and degree of commercial orientation:

- **Home gardens** —They are usually small and adjacent to a house or apartment, managed by residents, with production primarily for home use. Small-scale income generation from produce or value-added products is possible.
- **Community-based gardens** – The large garden plot is subdivided into several small plots. They are located on other city or community-owned land or on grounds of schools, churches, community centres, food pantries and housing developments. They are either

managed by the members of the community (with production mainly for use by the members' households) mainly or by the institution involved (for feeding school children, hospital clients or prisoners, or for income generation).

➔ *Commercial gardens and small farms* – Plots vary in size, but are usually larger than those in homes or community gardens worked by households. They are usually located in vacant lots in commercial or residential areas either owned or leased by the producer.

### **A. Case study-1: Green terraces**

Kerala Vegetable farming by clusters of farmers in Kerala remains water logged for most of the year. Hence vegetable prices went high. The Kerala state department of horticulture has taken initiative of promoting roof-top cultivation of vegetables in urban as well as Peri-urban areas. Vegetable initiatives for urban clusters: they use growbags to cultivate cauliflower, tomato, bottle gourd, bitter gourd etc. on terraces and on sticks, poles too. The farmers receive training from the state department who have taught them to grow vegetables on terraces, sticks and poles too. They grow cowpea and cucumber too.

### **B. Case study-2: Networks of farmers, Kerala.**

On a busy road, amid high-rise buildings, in convent road of Ernakulam, Kerala, grows the terrace farm (nurtured by 70-yearold ARS Vadhyar, a civil engineer). It has 3 coconut trees, 35 banana trees, papaya, guava, chickoo, grapes, pumpkins, ash gourd, snake gourd, bitter gourd, okra, tomato and many many more vegetables. All on just 1500 sq.ft. of terrace. Those who take up terrace farming are not regular farmers, but professionals like engineers, doctors, employees of public and private sectors.

Senior citizens, women home makers and even students. “Each district in Kerala has a minimum of 20,000 roof-top cultivators.” says K. Prathapan, Director, State Horticulture Mission. The main reason for this trend is growing health consciousness and fear of consuming contaminated foods. The social media has played a crucial role in sustaining the organic terrace farming movement. Groups such as Kitchen Garden, Krishi bhoomi etc. share knowledge among members. They got together and organised a 3-day exhibition cum training workshop on organic terrace farming. Such initiatives have generated awareness among people also informed about government subsidies, technology transfers and schemes.

**Summary:**

Although Urban agriculture occurs under varying socio-political conditions and policy regimes, it seems to indicate that urban policy-makers and support institutions, both governmental and non-governmental, can substantially contribute to enhancing its profitability and sustainability by

- formally accepting UA as an urban land use and creating a conducive policy environment;
- enhancing access to vacant open urban spaces;
- supporting the establishment and strengthening of urban farmer organizations;
- enhancing the productivity and economic viability of UA by improving access of urban farmers to training, technical advice and credit; taking accompanying measures that ensure that the health and environmental risks of UA are reduced (farmer training on health risks and related management practices, zoning, quality control of irrigation water and products).