

Review Article

Practicing Urban Agriculture Is the Most Appreciate Means to Fight Against Famine, Depression, Anxiety and Spread of Coronavirus

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Abstract: Urban agriculture is the cultivation of selective plants and animals rearing in the urban and pre urban areas for various purposes. Besides self-food sufficiency, urban agriculture is a means of social goodness, economic profitability, and precious environmental health. However, to date, most peoples in the town haven't practiced, and most spare parts of the town, roadsides, and gardens are not used for urban agriculture in almost all cities in Ethiopia. Consequently, this review paper aimed to call attention regarding urban agriculture and its plentiful significant. Since urban agriculture decisive to improve the livelihood, generates incomes and creates job opportunities. Besides, it is one of the most appreciated means to fight against famine, depression, anxiety, and the spread of coronavirus. In this paper, the types, principles, and prospects of urban agriculture are discussed based on the updated information. To this end, people can practice urban agriculture using a small plot, a container with soil or hydroponic and aeroponic systems, even if a location is a matter through the vertical farm and ensure self-food sufficiency, to stay safe and healthy.

Keywords: Animal Raring, Crop Horticulture, Food Forest, Self-reliance, Urban Agriculture

1. Introduction

Urban Agriculture is the major activity of plant cultivation and animal raring in the town for food and other benefits [1]. Now a day's, about 50% of the world population lived in town; from 15-20% of the food products found in town; About 70% of the population participate in Agriculture; 60% of the population in the town got their food necessities from Agricultural products [2].

Smallholder agricultural production systems are the main source of food and income for most of the world's poorest people, in both rural and urban areas. Improving these systems is critical to global poverty reduction and achieving food security objectives [3]. Food security exists when all people, at all times, have physical and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life [4].

Urban agriculture is practiced for commercial reasons, food self-sufficiency, food security, social, and gender inclusion. According to Foeken et al. [5] for the poor, food security is

usually the main motivation for farming in town, and for some, it is even a survival strategy. In addition, Mukherji and Morales [6] stated as urban agriculture is important to improve the food and food security system of the ultimately increasing population; create work opportunities, increase input and reduce losses; improve environmental conservation and encourage public relationships. As Hendrickson [7], the popularity of urban agriculture concerns about the environment has combined with increased interest in health and community-building issues, giving rise to support for food systems in metro areas as an integral part of a sustainable development path for cities. In addition, urban agriculture may function as an important strategy for poverty alleviation and social integration of disadvantaged groups (such as immigrants, HIV-AIDS affected households, disabled people, female-headed households with children, elderly people without a pension, youngsters without a job) by integrating them more strongly into the urban network, providing them with a decent livelihood and preventing social problems [8]

and now also to avoid depression and anxiety during the current coronavirus disease (COVID 19) pandemic.

Urban agriculture is also important for environmental management when the disposal of waste has become a serious problem in many cities. Urban agriculture can contribute to solving this problem by turning urban waste into a productive resource through compost production, vermiculture, and irrigation with wastewater (for non-food cultivation). Urban agriculture and forestry can also positively impact upon the greening of the city, the improvement of the urban micro-climate (windbreaks, dust reduction, shade) and the maintenance of biodiversity as well as the reduction of the ecological footprint of the city by producing fresh foods close to the consumers and thereby reducing energy use for transport, packaging, cooling, etc.

If the plot is close to home, inside the residential compound, farming activities can be ease tasks in the household, which is not the case that often requires traveling to the city center, public areas or better-off residential areas [9], especially during lockdown state of emergency like the current COVID 19 pandemic. Generally, urban agriculture plays its role as a source of employment, income, and food, which are indicators towards poverty reduction and improved food security in general and create work opportunities for those declared to stay at home, due to COVID 19 in particular.

Despite urban agriculture viewed as both a vehicle for empowerment, self-reliance, as an income generator, sustainable use, and management of natural resources, urban agriculture with many people has not been given attention and may be regarded as a less important activity in terms of its contribution of the urban economy and sustainable natural resource use and conservation. Mostly, agricultural products have fulfilled by transporting from rural areas to town, but by now some countries ordered a state of emergency that prohibits moving from rural areas to town and vice versa, mass gathering like in the market, traveling here and there, etc. Not only many households in the town have been engaged in a subsistence-oriented type of life and limiting with lower income to buy products, but also there has been an imbalance between supply and demand.

People living in hunger and poverty are most likely to suffer, and the lockdown measures during the pandemic itself may make people anxious. According to the statement of FAO [10], the COVID-19 pandemic is disrupting urban food systems worldwide, posing several challenges for cities such as anxiety, uncertainty, and disruption. Poor urban residents can only afford to buy food in small quantities, depending on small shops and open-air markets rather than supermarkets or food

delivery services, but the closure of each sector for public health reasons due to coronavirus makes the situation difficult. Under such circumstances, large numbers of city residents return to rural areas, risking the spread of the virus to isolated areas where health services are limited.

As reported by ILO [11], high value and especially perishable commodities, such as fresh fruit and vegetables, meat, fish, milk, and flowers are likely to be affected due to the challenges of supply chains, restriction of cross-border and domestic movements and labour issues during COVID 19 pandemic. With this health crisis, women and youth are likely to feel the impact more strongly, as they are particularly exposed to socioeconomic vulnerability.

For these reasons, as a means, it is essential to enhance efforts for the development of urban agriculture under a small area with low cost, and build up profit in contribution to poverty reduction. Moreover, ILO briefed [11], agri-food sector works have been chosen as essential in the context of the COVID-19 crisis in many countries, the measures adopted to slow down the pandemic may place further damage on the capacity food supply to continue meeting demand, providing incomes, and ensuring safety and health for the millions of agricultural workers and producers. Also to effectively address COVID 19 crisis both present and future, it is essential to improve the functionality of the agri-food sector. Therefore, practicing urban agriculture is the most appreciate means to fight against famine, depression, anxiety as well as the current spread of coronavirus. Thus, this paper aimed to call attention and inform people on urban agriculture and its importance based on published research outputs and observations.

2. Types of Urban Agriculture

2.1. Based on Production Types

Based on the production activity types, urban agriculture includes cropping (urban horticulture) and livestock activities [12]. In addition to the nutritional values, horticultural crops production delivers better incomes. Depending on the cultivated species, technologies adopted and other environmental factors, horticultural crops have much higher fresh yield, up to 50 kg/km², when compared with other food crops like grains, fruit, and vegetable crops [13]. Urban horticulture may include all fruit and vegetable food crops (including roots, tubers, nuts, aromatic plants, and mushrooms) or medicinal and ornamental species (Table 1). Thus, the adopted crop production systems are strongly related to the local culture and traditions.

Table 1. Some selective urban horticulture plants.

S/N	Category	Crop name
1	Vegetable crops	Cabbage (Brassica oleracea), Cucumber (Cucumis sativus), Garlic (Allium sativum), Cucumber (Cucumis sativus), Lettuce (Lactuca sativa), Onion (Allium cepa), Potato (Solanum tuberosum), Tomato (Lycopersicon esculentum), Mustard (Brassica campestris) Sweet potato, Pepper, Carrot, etc.
2	Fruit crops	Banana (Genus Musa), Melon (Cucumis melo), Orange (Citrus sinensis), Papaya (Carica papaya), Pineapple (Ananas comosus), Strawberry (Genus Fragaria), etc.
3	Aromatic plants	Lemon grass (Cymbopogon citratus), lavender, sage, mint and marigold, Thyme, basil and rosemary, etc.
4	Ornamental plants	Rose, trees, conifers, grasses, etc.

Horticultural crops have their crop phenologies and need various pre and post-harvest management techniques. They usually grow into small acreages but are very valuable and require intensive, skilled management. Most consumed directly by consumers. Within cities, it preferred to grow short-cycle crops.

In addition to horticultural crop production, livestock activities are conducted. Animals including, Hens (Egg-laying, meat, and dual purpose breeds), Cows, Beef, Pigs, Sheep, Goat, etc. can be easily farming in urban areas. In the current COVID 19 pandemic situation, the average, minimum and maximum cost for one egg is 4-5.5 birr; one kg meat 300-340 birr; one litter milk 17-26 birr and meat breed hens, Beef, Sheep and Goats have highly increased than ever in Ethiopian situation. In general, urban agriculture via animal rearing is the most appreciating activity to get benefits through food self-sufficiency and income sources. Now a day, the Ethiopian government has tried to extend urban agriculture in towns, and therefore, trained development agriculture (DAs) works mainly for plant and animal science streams. Thus, the urban people can get guidance from those extension workers for extra support even up to provide superior varieties.

2.2. Based on Production Units

Referencing to the availability of soil, water and plot /farmland/ urban horticulture may be either intensive when there are advanced technology or micro garden if simplified soilless systems use and the other may be community garden when large land used and divided into plots [14]. In order to address the low soil fertility and/or water availability, optimize the cultivation in limited spaces, and minimize the impact of horticultural production on the environment and human health, producers can use organic matter and various kinds of compost (organogenic cultivation) [15], and simplified soilless systems (Hydroponic systems) [16]. In highly urbanized contexts, horticultural crops can be done on the rooftops of houses [17].

In general, Pearson et al. [18] break down the urban agriculture into three main categories: micro commercial scale including green roofs, green walls, courtyards, backyards, street verges); meso commercial scale like community gardens, allotments, urban parks; and macro commercial scale. Therefore, urban residents can produce horticultural crops using available resources.

3. Principles of Urban Agriculture

Growing food in cities for human consumption could be one means of increasing global food supply in the face of rising population growth and global food security concerns. As stated by Van Leeuwen et al. [19], environmental health, economic profitability, and social wellness are the main integrated principles of sustainability in urban agriculture. To produce horticultural crops on a small scale, firstly land should be preferably selected and prepared for a plot with appropriate layout with South to North extension.

Fast-growing fruit crops should be planted on the South and/or North sides of the garden and so that they do not shade other crops. Climber plants like cucumber and pea can be planted nearby to the fence [20].

For all horticultural crops, the spacing between plant and row (intra-row and inter-row) and planting depth should set accordingly. If the access of land is not available, producers can use containers like tin, sack, etc. on the ground, on the roof and wall sides using appropriate media composition (soil, compost, and sand) or hydroponic system. The starting material, either seed or vegetative part (propagule), should be mature, healthy, viable, and vigorous. For seeded crops, it is better to grow seedlings on the nursery site and transplant into the main plot with the recommended growth stage.

As Petrovic et al. [21] indicated, for self-food sufficiency and increase competitiveness in the global market contribution with livestock farming, the application of new technologies like molecular genetic should be used to improve the production of certain species and breeds of domestic animals. Besides, the presence of appropriate space and good quality feed is advisable. In parallel, preserving the environment from the adverse effects of livestock production, the environmental protection policy implemented through organic agriculture /urban horticulture/ which is the current interest in modern agriculture against chemical fertilizer.

4. Urban Agriculture Prospects

As Van Leeuwen et al. [19] outlined the history of urban green spaces goes back to 600 BC just then the functional use of green spaces changing over time. During the world war I and later in world war II, peoples in the USA advised and supported by government officials to grow food on extra land available in the cities and urban agriculture in global food security has become an important discussion when the global population reaches to higher (about 9 billion) by the year 2050 [22]. The future of urban agriculture becomes bright from past experiences and with subsequent situations. Especially in developing countries like Ethiopia, the number of the population becomes increasing due to rural to town migration. As a result, urbanization has expanded towards farmlands which are potential for food crop production. Instead to the horizontal expansion, vertical construction of residences is being adopted and better to use the spare lands for urban agriculture.

In intense urbanization where a location matters, vertical farm with soil or hydroponic and aeroponic systems is prudent. As indicated by various scholars, vertical farms have proposed as a solution for future cities' food in the limits of ultra-efficient greenhouses [23], can be applied to every urban center with year-round produce; lack of crop loss due to weather events; no use of fossil fuels to harvest, transport, and refrigerate; no use of pesticides and herbicides; job creation in urban centers; lesser water use; and limited spoilage from excessive handling [24]. The other important future in urban agriculture is being food forests. Krishnan et al. [22] stated

that the food forest is above green space, it provides valuable economic, environmental, and social benefits.

5. Conclusion

Urban agriculture, plant cultivation, and livestock activities are a means to stay safe and give up an urban food desert. It can carry out in a small area with a low cost. In addition to self-food production, urban agriculture also offers environmental health, social goodness, and economic profitability. Now a day, to reduce the coronavirus epidemic, many countries have taken lockdown measures; people forced to stay at home, and banned domestic and cross-boundary movements. Consequently, food supply in cities may become inadequate, even difficult to buy, especially for the poor during COVID 19 pandemics. Moreover, people may get depression and anxiety while staying at home for ample of weeks. Indeed, practicing urban agriculture is one of the possible means to evade famine, depression, anxiety as well as the spread of coronavirus. In general, urban residents should custom urban agriculture while staying at home and ever to ensure self-reliance through self-food sufficiency, to be healthy, and to save life during COVID 19 pandemic.

Declarations

Availability of Data and Material

In this review paper is prepared based on the previous published researches and so that all statements are paraphrased and cited correctly.

Competing Interest

No competing of interest exists

Author's Contribution

This work was carried out by author, *Chanie Derso Misganaw*. He reviewed, edited, read, and approved the whole document.

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