



Potential And Need of Urban Horticulture for A Sustainable Future

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Abstract

The new concept Urban Horticulture which enforces growing family sufficient food in urban and peri urban areas is gaining importance nowadays. Traditionally, crop cultivation and food security was mainly confined to rural areas of the world. But dynamics are changing with developing world around us. Urban environment also known as a ‘built-up’ region, is an area with high population density along with modernized infrastructure created by urbanization. As Urbanism is completely in contrast to the natural environment, plants grown and cultivated in such a condition also experience altered growing conditions. Environmental factors affecting urban farming can be divided into the following sub-factors 1.) Soil contamination 2.) Micro-climate alteration and air pollution 3.) Contaminated water resources. World population will reach up to 9.6 billion by 2050 and 70% of which is assumed to be residing in urban communities and in 2030 India’s 600 million population will be urbanized. Cuba is the only country that has developed an extensive state-supported infrastructure to support urban food production and urban growers with 12% of the country’s urban area is under cultivation. Urban horticulture can be: intensive horticulture, plant nurseries, community gardens, macro-mini gardens, Terrace Gardening, Vegetable Gardening, Balcony Gardening, Green Parks, Guerilla Gardening, Allotment Gardens and Community Gardens. UH impacts city environmentally and socio-economically; thus, appropriate guidelines on urban and peri urban agricultural practices are required for proper understanding.

Keywords: Climate Change, Food Security, Sustainability, Urban Horticulture

Introduction

Traditionally, crop cultivation and food security were mainly looked after by rural areas of the world. But with the developing world around us, dynamics are changing. The new concept of Urban Horticulture which enforces growing family sufficient food in urban and peri-urban areas is gaining importance nowadays (Tasciotti and Wagner, 2015). Food security and sustainability attained by this is the prime reason for its demand and need in recent times. The science of cultivating horticultural crops



and studying their relationship with the urban environment is specified as 'Urban Horticulture. Horticultural crops involve vegetables, fruits, floricultural crops, medicinal, aromatic crops along with some spice crops. The urban environment also known as 'built-up' regions are the areas with high population density along with modernized infrastructure created due to urbanization. As Urbanism is completely in contrast to the natural environment, plants grown and cultivated in such a condition also experience altered growing conditions.

Thus, Urban and Peri-urban horticulture is the cultivation of all the horticultural crops for human consumption and ornamental beautification within or immediate vicinity of the residency in urban areas.



Figure 1: Components of urban horticulture

The barren land is generally modified by constructing urban sites such as malls, residential areas, amusement parks and various other functionalities to develop a city. This trend of population concentration in and around urban areas has created many problems, such as a reduction in farmable land, increased malnutrition, and increased distances to traditional sites for food production (Suman, 2019).



A term kitchen gardening holds the solution to this reduction in land availability. Kitchen garden or homestead garden in an urban sense is to grown family sufficient quality food produce in the backyard or terrace of the house by cultivating suitable plants. Many horticultural crops are considered ideal to this production systems because they occupy a smaller growing space, produce more per unit area, have high value low volume crops and short production cycles. For example, diverse leafy vegetable may be grown and harvested within a short period of time (60–90 days) and some perennial short growing herbs can provide yield for many years. (Dubbeling *et al*, 2010)

Crop selection is based on the area, family preference, and usage. Factors such as climate, soil, access to water, insects, diseases, costs of production, and most importantly, the shelf life of the crop itself influence the location of production. The last factor explains why, for most urban markets, leafy vegetables are produced in urban and peri-urban areas. Some leafy vegetables are well adapted to a hot wet season. Short-lived leafy vegetables are key to ensuring nutritional security as well as suites urban farming. Knowing the importance of nutrients rich leafy vegetables, the urban population turns down the track leaving junk food. Thus, leafy vegetables can be a great option for urban farming due to their short life, nutrients, and demand. Generally, annual or short-lived horticultural crops are preferred in cities due to reduced land and labor availability (Francesco *et al*, 2013). While in the vicinity of cities, perennial or long-lived crops can be grown. Cultivation practices are influenced by traditional methods being followed in the region from the past (China Development Research Foundation, 2010). However, some Hi-tech or innovative methods are also adopted such as rooftop gardening, hydroponics, organic production, etc. The potential of horticulture in raising agricultural production, value addition, farm income, and employment in the country has been recognized long ago. The Fourth Five-Year Plan (1969-74) recognized the importance of this sector in India (Chand *et al*, 2008).

Rapid urbanization, growing population, and intensification of resources made urban horticulture more than just a hobby. Now, it is the future requirement for sustainable food supply and nutritional security. Although, this field of study is large and complex it gained momentum recently. (Tasciotti and Wagner, 2015). The challenges and advantages of urban horticulture are also discussed in this article. The social, Environmental, Economic, and Aesthetic importance of UH is key to the sustainable development of the urban community (Manikas, 2019). The concept of UH is gaining interest in developing countries and low-income countries. UH is considered as an element to build a community with sustainable development and food security. Thus, urban horticulture is a great means



to satisfy the food supply and secure its availability for urban dwellers. However, the adoption of this practices is largely affected by available area under expansion. (Edmondson, 2020)

Our main objective is to demonstrate the significance of urban horticulture, combined with new technologies to meet the needs of people in urban settings, for safeguarding community livelihoods, food security, and the environment, moreover the objective of the study is to discuss, in detail the traditional innovative and modern cropping system that can be easily adopted in growing agricultural commodities in urban dwellings, for sustainable food supply during COVID19. It is also hoped that the findings of this research will contribute to promoting urban horticulture in developed and underdeveloped countries. This review focuses on giving an overview of the current scenario of urban horticulture in the world.

1. Need for urban horticulture

From a global perspective, it can be said that urban agriculture/horticulture isn't a new concept. It's an age-old concept that evolved according to the community.

4 pre-dominant reasons that set the foundation for the global requirement of urban horticulture are subsistence, economics, recreation, and community building (Hallett *et al*, 2017). Depending upon the requirement, people tend to involve it in urban farming. For instance, Sub-Saharan Africa is considered the poorest country with an insecure food supply system. Such a region in the world practices urban horticulture for subsistence. Thus, horticultural crops being rich in macro and micronutrients can act as a potential source to cure the country's malnutrition. Results concluded by Maxwell *et al*, (1998) also signified that there has been significant improvement in the health of children in Kampala, Uganda having access to urban plots.

A similar case study presenting the role of community gardens in lying down the foundation of a community's social capital was explained by Firth *et al* in 2011. Community gardens in urban regions generate social strength by bringing society together to participate in group activities. A sense of ownership, collectiveness, and pride is observed among the residents of the urban community who gather to enjoy their leisure time. Thus, community gardens let like-minded people together, built connections, and join through a common network that identifies similar interests. (Glover, 2004)

Agriculture/Horticulture and various farm-related activities are commonly practiced in rural areas of the world. But due to urbanization, global warming, climate change, and Diaspora migration; a way to create a sustainable method for securing food requirements becomes necessary. With rapid migration, lifestyle has also evolved from a cereal-based diet to a nutritious one, where horticulture



produces becomes important (NAAS 2013). Looking at the present scenario, Urban Horticulture can sufficiently cope with the requirements of an ever-changing spectrum of urbanization.

Diaspora migration: In order to have a better living standard rural communities are willingly or unwillingly migrating to the urban areas. This large-scale migration crossed its threshold when 50% of the world's population was living in urban areas in 19S. With the increasing population, it is estimated that by 2030 India's 600 million population will be residing in urban areas. (NAAS, 2013).

Urbanization: Huge migration from rural to urban has been noticed in past few years worldwide and it is said that urbanization has crossed its threshold as more than 50% of it is considered urban. Currently, Asia and Africa still have a predominantly rural population, while Europe, North America, and Oceania were already urbanized regions before 1950. As per the prediction, the world's population will reach up to 9.6 billion by 2050 and 70% of which is assumed to be residing in urban communities (United Nations, 2018).

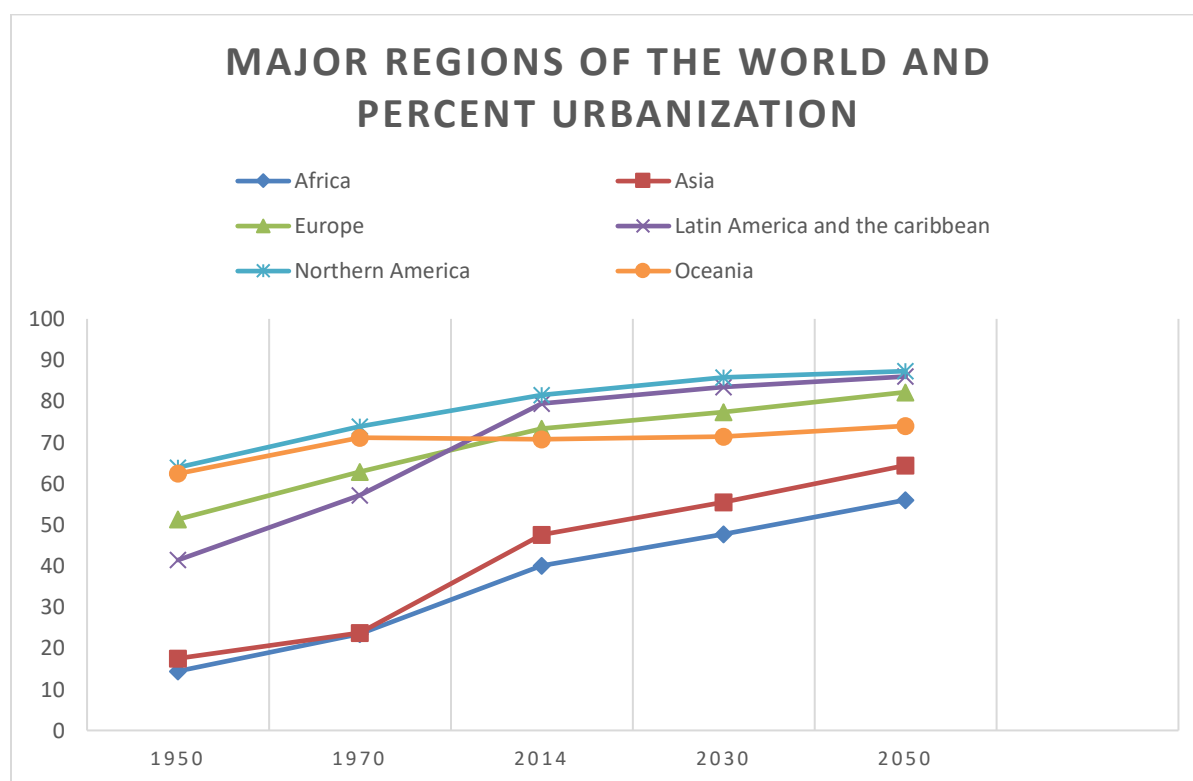


Figure 2: Percent Urban population residing in major regions of the world.

India, on the other side, will have a rapid stride with the population of more than 1.5 billion by 2030, the highest in the world. This enforces the need for the provision of food for ever-blooming non-farming urban communities. In addition to this, urbanization also creates a demand for natural resources such as



land, water, timber, energy, and labor from rural areas to a far larger extent than the actual requirement. Urbanization and farming can be considered interconnected. Farming provides necessities for cities and communities to dwell while urban communities require farming for their sustainability. (Mougeot, 2005).

Climate change: Climate change has been one of the prime reasons to accelerate the need for urban farming. It is estimated that with every 1°C increase in temperature, 10% of the area under cultivation will become unavailable. Trees and plants have their own environmental services other than commercial and aesthetic ones. As a part of UPH, landscaping can help greening areas in order to mitigate climate change imparting various health benefits. Recently, the urban population has an inclined interest in landscaping. Various forms of urban greening are green buildings, greenbelts, green roofs, and energy conserving landscapes, and using ideal plants for air and sound pollution in residential houses. Part of urbanization is believed to degrade ecological balance by interfering with its natural cycle. Degradation of land, forest, and other resources has led to serious climatic conditions that it has now become necessary to expand green areas in urban regions so as to maintain environmental security (NAAS, 2013)

What many community leaders recognize is that the world's space and resources are shrinking and that we must find innovative new ways to live together. Our consumption of natural resources and production of waste, some of it deadly toxic, also has risen dramatically. Our growing demands on the Earth's natural systems are creating serious social, environmental, and health costs. Grave predictions about the future have become common and many believe that we are threatening the survival of life on Earth. (Roseland M, 2000)

2. Components of urban horticulture

Urban horticulture, depending on the resources used can be classified into the following types: intensive horticulture, plant nurseries (Drescher and Laquinta, 1999), community gardens (Francesco *et al*, 2013), and macro-mini gardens. Other forms of urban horticulture are Terrace Gardening, Vegetable Gardening, Balcony Gardening, Green Parks, Guerilla Gardening, Allotment Gardens, and Community Gardens.

3. Factors influencing urban horticulture

In this section, we have organized our reviews on the benefits and challenges of urban horticulture. Sustainable development of U farming in cities is mainly the result of constraints and opportunities provided. Horticultural systems developed in urban areas mainly face resource scarcity



(water, land, labor, and access to other inputs) and pollution (air, water, soil). Economically, production can also be comparatively costlier in urban areas than in rural ones.

4. Benefits of UH- economic/environmental/health/aesthetic

Sustainable urban development: A holistic approach that focuses on both food production and physical well-being is a tool for the sustainable development of communities. Although, the clear benefits of this approach have not been organized yet. (UN, 2020) Urban horticulture is providing promising solutions to several Sustainable Development Goals (SDGs), such as “Goal 3, good health and well-being,” “Goal 11, sustainable cities and communities,” and “Goal 12, responsible consumption and production,” as marked by the United Nations General Assembly in 2015.

Employment: In developing nations, urban horticulture is generally practiced to generate independent businesses and a source of direct income or funds thereby prompting social security (Van Leeuwen *et al*, 2010).

Fresh and organic daily consumption fruits/vegetables: Gardening without the use of synthetic fertilizer, pesticides, herbicides, and fungicides are called organic farming, and crops such as sweet onions, garlic, peppers, cucumbers, watermelon, cantaloupe, squash, eggplant, and many more can be successfully cultivated following organic practices. In recent years, the demand for organic food is gaining popularity (Yue *et al*, 2011) with a yearly increase in organic food sales worldwide of over \$5 billion (Willer *et al*, 2008).

Urban land management: vacant and barren land is quite common in urban areas. Thus, urban farming provides opportunities for residents to make the area greener, grow horticultural crops, etc.

Reducing carbon footprint/CO2 emission: In addition to greening urban areas, urban farming is also a potential factor for reducing carbon emissions. As an important ecological function, UH reduces transportation and packaging needs, conserves and energy, reuses organic waste/compost. (McPherson, 1992; Giusquiani *et al*, 1995; Pretty *et al*, 2005; Norris K, 2008). Thus, by producing food in and near cities can reduce fuel consumption required for transportation and eventually CO2 emissions associated with it. (UN, 2020)

Nature Therapy: Urban horticulture provides communities with more opportunities to interact with green plants and flowers, which not only helps to add beautification to the cities but also poses a positive impact on society (Wakefield *et al*, 2007). Various types of research have been done demonstrating the stress-relieving effect of UH along with improving self-esteem, social interactions, and cognitive health.



The overall health of cities: Ecological health of cities depends on the greener area. UH also contributes to the overall health of urban ecosystems by expanding the area under vegetation, adding aesthetic values and ethnic heritage, encouraging group/individual interest, and improving physical health. (Brown and Jameton, 2000; Lovell ST, 2010; Hampwaye G, 2013).

5. Urban Horticulture however faces a few challenges such as

In developing countries, the consumption of vegetables and fruits is generally lower than the FAO recommendation (Zeeuw and Drechsel, 2015). Citizens and governments are taking action in their cities and towns and across national boundaries to protect the environment, address poverty and other social issues, and improve the quality of life now and in the future. Not much population residing in an urban area has access to agricultural resources like adequate land availability, irrigation water, etc.

Poverty: huge migration from rural to urban areas is to eradicate poverty and earn more than they require for their livelihood. Hence, starting a venture like UF requiring modern equipment can be expensive for growers. Lack of required knowledge and skills. UH can be done by armature horticulturists which signify their lack of scientific knowledge.

Environmental factors: Environmental factors affecting urban farming can be divided into the following sub-factors 1.) Soil contamination 2.) Micro-climate alteration and air pollution 3.) Contaminated water resources (Wortman and Lovell, 2013) Horticultural produce is constantly under threat to various pollutants, as city soil is highly contaminated by toxic heavy metals (Pb, arsenic, cadmium) and petroleum waste (Kim et al, 2014). Not only the horticultural produce is affected but indiscriminate and inappropriate use of inputs can in return add to an urban environment. The surrounding environment is continuously exposed to the negative impacts of indiscriminately used fertilizers, composts, pesticides, etc (Taylor & Lovell, 2014). Not only excessive usage but improper disposal of inputs can also pose a serious threat to both environment and farmers (Brown and Jameton, 2000).

Growing food in the city means there is a need for pollinators, and that means bees, but many cities have ordinances that forbid honey bee colonies on the grounds that bees are a "threat" to humans. But this too is changing. Efforts are underway in New York City to amend the city's Health Code that currently prohibits the possession, keeping, harboring, and selling of "wild animals" and "venomous insects," in which bees are included. For urban agriculture to succeed, cities often have to modify or create new ordinances that deal with manure and noise issues (Broadway M, 2009).

As defined above, urban agriculture presents social, environmental, and economic impacts on the city (Ba *et al.*, 2005). When using poor practices, can have a negative impact on human health and

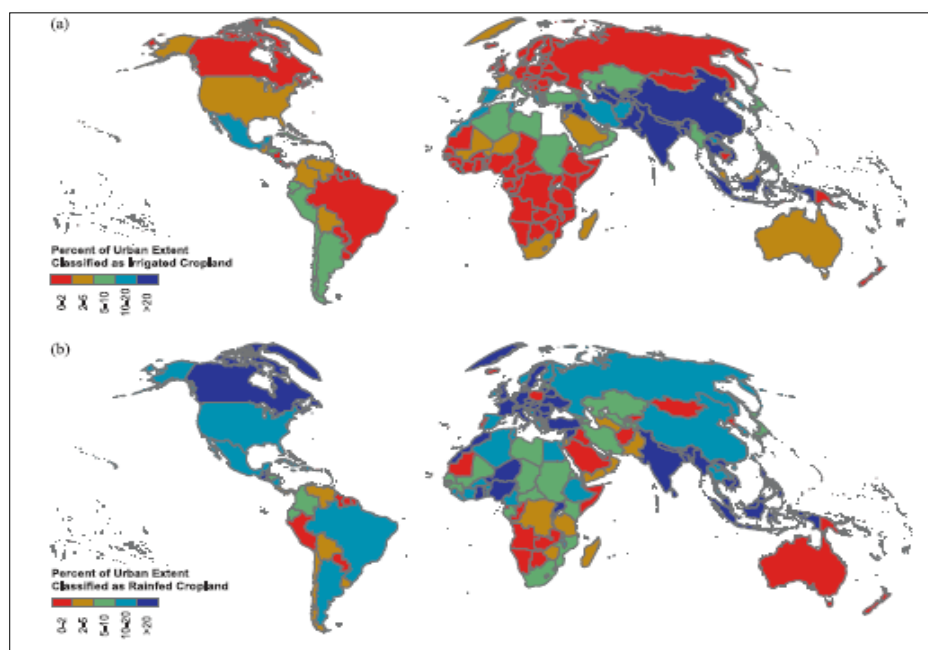


Figure 3: Classification of area as per irrigated and Rainfed cropland

the environment. Consequently, guidelines on appropriate urban and peri-urban agricultural practices are required, which can be properly understood and followed only with a higher awareness of the population (all consumers, actors of the food chain, and policymakers as well) and a better education.

6. Urban horticulture and global outlook

Increasing practices of urban farming in parts of Asia, and Africa as well as in both South and North America is been reported by various researchers (Ezedinma and Chukuezi, 1999; Han, 2008; Pinderhughes, Murphy, and Gonzalez, 2000). In the United States, urban farming was evidenced as a form of small-scale community gardens and victory gardens (Lawson, 2005).

Among these South and East Asia comprise 49% of urban-irrigated croplands globally (Thebo, Drechsel, & Lambin, 2014). Cuba is the only country in the world that has developed an extensive state-supported infrastructure to support urban food production and urban growers (Premat, 2012). Almost 12% of the country's urban area is under cultivation making it the strongest farming system in the world (Lee-Smith and Prain, 2006). However, Havana has become an exemplary model of this new self-provisioning, a precedent that demonstrates both the opportunity and obstacles for the transference of



urban agriculture to other regions. A survey by (Etana, M. B., Gonfa, M. T. & Duresa, C. O. 2019. Urban Horticulture) depicted that farmers of Sebeta town practicing urban farming were able to raise their income by growing fruits, vegetables, edible leaves, roots, and tuber crops in and around the vicinity of the town. In addition to its economic aspect, urban farming also contributed to proper waste management, food security, greener ecosystems, and combating unemployment. An estimated population of 5-10 million suffers from a nutritional deficiency in Ethiopia, out of which 80% are children. Urban farming with horticultural crops can ensure nutritional security in low-income and poor countries. In response to expanding the idea of urban horticulture, cities are now moving beyond this conventional global food supply system and shifting to a sustainable and environmentally friendly way (Sonnino R, 2016). Thus, 209 cities worldwide agreed Milan Urban Food Policy Pact and its aim is “to develop sustainable food systems that are inclusive, resilient, safe and diverse”.

With growing urbanization and the increased population, there should be a sustainable alternative to modern world challenges. With changing dynamics around the world where the focus has been shifted from conventional methods to sustainable ones, urban horticulture seems to gain attention. Urbanization not only comes with swifter and smoother life-enhancing facilities but also has some never-ending problems. Today, when the world is facing climate change, population explosion, urbanism, and irregular food supply, urban horticulture seemingly contribute to serving as a solution. It aims at balancing the harmony of nature and technology, which can be successfully witnessed in cities with sufficient green space.

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References

- Ba, A. To, H. and Fleury, A. 2009. The Concept of Urban Agriculture Renewed for Cities of the South. *Open House International*, **34(2)**: 107-14.
- Broadway, M. 2009. Growing Urban Agriculture in North American Cities: The Example of Milwaukee. *Focus on Geography*, **52**: 23-30.
- Brown, K.H. and Jameton A.L. 2000. Public health implications of urban agriculture. *Journal of Public Health Policy*, **21**: 20–39.
- Chand, R.; Raju, S.S. and Pandey, L.M. 2008. Progress and Potential of Horticulture in India. *Indian Journal of Agricultural Economics*, **63(3)**: 1-11.
- CDRF, (2010). Trends in urbanisation and urban policies in OECD Countries: what lessons for China? China development research foundation. Organization for economic co-operation and development (OECD), Pp 1-219.
[https:// www.oecd.org/urban/roundtable/45159707.pdf](https://www.oecd.org/urban/roundtable/45159707.pdf)



- Drescher, A.W. and Iaquina, D. 1999. Urban and Periurban Agriculture: A new challenge for the UN. Food and Agriculture Organisation (FAO). Internal report. Pp 1-214, Rome.
- Dubbeling, M.; Zeeuw, D.H. and Veenhuizen, V.R. 2010. Cities, Poverty and Food Multi-Stakeholder Policy and Planning in Urban Agriculture. RUAF Foundation, Pp 152 UK.
- Edmondson, J.L.; Cunningham, H.; Tingley, D.O.D; Dobson, M.C.; Grafius, D.R. and Leake, J.R. 2020. The hidden potential of urban horticulture. *Nature Food*, 1: 155–159.
- Ezedinma, C. and Chukuezi, C.A. 1999. Comparative analysis of urban agricultural enterprises in Lagos and Port Harcourt, Nigeria. *Environment and Urbanization*, 11(2): 135–144.
- Firth, C.; Maye, D. and Pearson, D. 2011. Developing community in community gardens. *Local Environment: The International Journal of Justice and Sustainability*, 16(6): 555-568.
- Francesco, O.; Remi, K.; Remi, N.W. and Giorgio, G. 2013. Urban agriculture in the developing world: a review. *Agronomy for Sustainable Development*, 33: 695–720.
- Giusquiani, P.L.; Pagliai, M.; Gigliotti, G.; Businelli, D. and Benetti, A. 1995. Urban waste compost: Effects on physical, chemical, and biochemical soil properties. *Journal of Environmental Quality*. 24: 175–182.
- Glover, T.D. 2004. Social capital in the lived experiences of community gardeners. *Leisure Sciences*, 26: 143–62.
- Hallett, S.; Hoagland, L. and Toner, E. 2017 Urban Agriculture: Environmental, Economic, and Social Perspectives. *Horticultural Reviews*, 44(1): 72-75.
- Hampway, G. 2013. Benefits of urban agriculture: Reality or illusion?. *Geoforum*, 49: R7–R8. 10.1016/j.geoforum.2013.03.008.
- Han, M. 2008. Integrated research partnerships for urban habitat development in Casablanca, Morocco. Paper presented at the WUF4, Nanjing, China, 3–6 November 2008.
- Henk de Zeeuw and Pay Drechsel (2015) cities and agriculture Developing resilient urban food systems
- Kim, B.F.; Poulsen, M.N.; Margulies, J.D.; Dix, K.L.; Palmer, A.M. and Nachman, K.E. 2014. Urban community gardeners knowledge and perceptions of soil contaminant risks. *PloS One*, 9(2): e87913. doi:10.1371/journal.pone.0087913
- Lawson L.J. *City bountiful: A century of community gardening in America*. University of California Press, Berkeley, CA. 2005
- Lee-Smith, D., and G. Prain. 2006. Understanding the links between agriculture and health: Urban agriculture and health. 2020 Vision for Food, Agriculture, and the Environment. http://www.ifpri.org/sites/default/files/publications/focus13_13.pdf (accessed 11 Dec. 2012).
- Lovell, S.T. 2010. Multifunctional urban agriculture for sustainable land use planning in the United States. *Sustainability*, 2: 2499–522.
- Manikas I, Malindretos G, Abeliotis K. Sustainable Cities through Alternative Urban Farming: The Case of Floriculture. *Journal of International Food & Agribusiness Marketing* 2019. 32(3): 295-311.
- Roseland, M. Sustainable Community Development: Integrating Environmental, Economic, and Social Objectives. Volume 54, Part 2 of Progress in planning, ISSN 0305-9006 2000
- Maxwell, D.G. 1995. Alternative Food Security Strategy: A Household Analysis of Urban Agriculture in Kampala. *World Development*, 23(10): 1669-81.
- McPherson, E.G. 1992. Accounting for benefits and costs of urban greenspace. *Landscape and Urban Planning*, 22: 41–51.
- Milan Urban Food Policy Pact (MUFPP, 2015); <http://www.milanurbanfoodpolicypact.org/text>



- Mougeot, L. J. A. Editor AGROPOLIC. The Social, Political and Environmental Dimensions of Urban Agriculture, Earthscan, London, 2005.
- NAAS 2013. Urban and Peri-urban Agriculture. Policy Paper No. 67, National Academy of Agricultural Sciences, New Delhi: 12 p.
- Norris, K. 2008. Agriculture and biodiversity conservation: Opportunity knocks. *Conserv. Lett* 1: 2-11.
- Pinderhughes, R.; Murphy, C. and Gonzalez, M. Urban Agriculture in Havana, Cuba. Urban Studies Program. San Francisco, USA: San Francisco State University.
- Premat, A. 2012. Sowing change: The making of Havana's urban agriculture Nashville, TN: Vanderbilt University Press.
- Pretty, J.N.; Ball, A.S.; Lang, T. and Morison, J.I.L. 2005. Farm costs and food miles: An assessment of the full cost of the UK weekly food basket. *Food Policy*, 30: 1–19.
- Sonnino, R. 2006. The new geography of food security: exploring the potential of urban food strategies. *Geogr. J.* 182: 190–200.
- Suman, M. 2019. Urban Horticulture Prospective to Secure Food Provisions in Urban and Peri-Urban Environments. *International Journal of Pure and Applied Biosciences*, 7: 133–140.
- Tasciotti, L. and Wagner, N. 2015. Urban agriculture and dietary diversity: Empirical evidence from Tanzania. *The European Journal of Development Research*, 27(5): 631–49.
- Taylor, J.R. and Lovell, S.T. 2014. Urban home food gardens in the Global North: Research traditions and future directions. *Agriculture and Human Values*, 31(2): 285–305.
- Thebo, A.L.; Drechsel, P. and Lambin, E.F. 2014. Global assessment of urban and periurban agriculture: Irrigated and rainfed croplands. *Environmental Research Letters*, 9;1–9.
- United Nations. Sustainable Development Goals. Available online: <https://sustainabledevelopment.un.org/sdgs> (accessed on 10 June 2020).
- United Nations. The 2018 Revision of the World Urbanization Prospects. Available online: <https://www.un.org/development/desa/en/news/population/2018-revision-of-world-urbanization-prospects.html> (accessed on 10 June 2020).
- Urbanization trends by major regions (1950–2050) UN 2014. World urbanization prospects: The 2014 revision. Washington, DC: United Nations, Department of Economic and Social Affairs, Population Division. Available from: <http://esa.un.org/unpd/wup/Highlights/WUP2014-Highlights.pdf>
- Etana, M.B.; Gonfa, M.T. and Duresa, C.O. Urban Horticulture: The Case of Finfinne Area Sebeta Town in Ethiopia. *International Journal of Agriculture & Agribusiness* 4(2): 133–138.
- Van Leeuwen, E.; Nijkamp, P.; de, Noronha Vaz T. 2010. The multifunctional use of urban greenspace. *International Journal of Agricultural Sustainability*, 8(1–2): 20–25.
- Wakefield S, Yeudall F, Taron C, Reynolds J, Skinner A. Growing urban health: Community gardening in South-East Toronto. *Health Promot. Int* 2007. 22; 92–101.
- Willer, H.; Yuseffi-Menzler, M. and Sorensen, N. 2008. The world of organic agriculture: statistics and emerging trends. International Federation of Organic Agriculture Movements (IFOAM), Germany.
- Wortman, S.E. and Lovell, S.T. 2014. Environmental Challenges Threatening the Growth of Urban Agriculture in the United States. *Journal Environmental Quality*, 42: 1283–94.
- Yue, C.; Dennis, J.H.; Behe, B.K.; Hall, C.R.; Campbell, B.L. and Lopez, R.G. 2011. Investigating consumer preference for organic, local, or sustainable plants. *HortScience*, 46(4): 610–615.