

Original Article

An Individual's Perception of Urban Farming with Respect to Different Aspects of the World

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Abstract - Urban farming is a relatively recent concept, which has heavily influenced various aspects of the world in different ways. Urban Farming can be defined as the practice of growing, processing, and distributing food through plant cultivation in and around cities to feed local urban populations. It is a farming technique which promotes the sustainable development of food. The present study focuses on comprehending the perceptions of people towards urban farming by focusing on key areas like the economy, environment, society and food and attributes. Concept mapping as a technique was used by gathering primary data from 20 respondents through a self constructed questionnaire from people belonging to various age groups ranging from 15 to 30 years of age residing in Delhi NCR, India. The questionnaire prompted individuals to fill in 7-10 phrases which they use to associate urban farming with one of the key areas mentioned earlier. These phrases were used to create concept maps where each one acted as a node that connected them together to a central idea. These central ideas were then used to obtain the main interpretation from these themes and also significantly aided in concluding the results of this study. Therefore, the central ideas provided scope for further implications of the individual's perception in specific areas within the 4 themes. The findings of the present study can also help in teaching about urban farming in schools can help children develop a greater understanding of their academic subjects and learn from a young age the importance of conserving the environment.

Keywords - Urban farming, Economy, Environment, Society, Food and Attributes.

1. Introduction

Urban Farming can be defined as the growing, processing, and distribution of food and other products through plant cultivation in and around cities for feeding local urban populations that can be practiced using numerous techniques such as aeroponics and aquaponics.[1,2]

It offers a variety of benefits in various parts of a community. From an environmental perspective, it promotes the use of organic farming practices by reducing reliance on chemical pesticides and fertilizers and contributes to healthier ecosystems by also reducing water pollution, helping preserve biodiversity, and preventing climate change. [3]

From a socio-economic aspect, urban farming, when practiced as a main occupation, has significant social and economic benefits for communities. It creates opportunities for local employment and entrepreneurship, decreasing the rate of unemployment. Particularly, it can help younger people in the labor force find jobs easily and earn a steady income. Urban farming projects often involve community participation, improving the overall quality of life in urban neighborhoods as well. [4] By increasing the level of community engagement, it can help foster peaceful and more secure urban cities. Furthermore, urban farming is

significant in enhancing food security. By producing food locally, urban farming reduces dependence on distant food sources. It helps negate the risks associated with disruptions in transportation or natural disasters, ensuring a more reliable food supply. These agricultural practices promote the cultivation of a diverse range of crops and enhance the nutritional diversity of urban diets. [5]. This further helps urban farmers run their businesses more easily since they are not reliant on climate conditions for great harvests. It can improve the health of people in urban communities by increasing the nutritional value of crops grown using a special soil which contains minerals, trace elements, proteins, microorganisms, and other substances. [6] Additionally, it guarantees access to fresh produce in urban areas where food and vegetables are usually transported from farmlands over long distances.

Even with various advantages, urban farming is still not adopted in major urban cities. Potentially, the cause for this issue is the lack of awareness of individuals from urban areas regarding urban farming. Thus, this study also emphasizes the severity of this issue and aims to convey the benefits of urban farming to the general public in a comprehensible way. This claim is also supported by previous studies conducted in this field [7], whose findings suggest that while there is a positive overall perception, individuals' awareness and knowledge structures about



urban farming can vary significantly. Some might be practicing urban farming, while others only know that it is a green practice. However, the former were rarely seen amongst the respondents who were contacted for collecting primary data. This study focuses on an individual's perception of urban farming in regard to four key areas of any part of the world: Economy, Society, Environment and finally, Food and Attributes. These broader concepts are treated as key themes, with each having several sub-themes within themselves.

2. Methodology

2.1. Research Aim

The research aimed to analyze consumers' perception and their level of awareness of urban farming in Delhi NCR [National Capital Region].

2.2. Sample

Approximately 20 individuals from a large range of age groups (17-34 years of age) were asked to fill out a questionnaire. Convenience sampling was carried out. The sample group is located in Delhi [National Capital Region] Gurgaon.

2.3. Tools Used

The questionnaire was prepared using Google Forms and had a total of 10 questions. It recorded the respondent's personal information (gender, age and educational background), checked for any previous understanding regarding urban farming and finally, their perspective on urban farming with respect to Economy, Environment, Society and Food and Attributes. After obtaining the primary data, software (MindManager) was used to create the concept maps and graphically represent them. The questionnaire's prompts were asked to recall freely their associations concerning a certain keyword that allows the respondents to view the concept of urban farming from a

different perspective and directly link the associations to each other, which allows the visualization of the semantic networks.

2.4. Data Collection

The study used a qualitative research design and collected data through concept mapping, a method that produces a schematic representation of the relationships of stored units of information using data gathered from a questionnaire.

2.5. Data Analysis

The study used a questionnaire with highly structured questions which focused on specific categories. Then, using concept mapping, the responses were organized and analyzed according to their respective categories, which were provided to the respondents for each question. Concept mapping is a method that produces a schematic representation of the relationships of stored units of information, which are activated by the stimulus. The interviewees are asked to recall freely their associations concerning a certain stimulus and directly link the associations to each other, which allows the visualization of the semantic networks. Afterwards, the frequency of each category was calculated and tabulated.

2.6. Ethical Considerations

Through the questionnaire, the respondents were assured of the fact that their personal information would not be used for commercial purposes. The respondents were assured that any personal information gathered would not be shared publicly and would only used for research purposes. Hence, anonymity was maintained through the questionnaire. None of the information provided by the respondents was used without their consent throughout this study.



Fig. 1 Concept map of Sub-theme-Positive environmental practices

3. Results and Discussion

Four broader themes were extracted from collected data regarding what a respondent associates urban farming with. The broader themes are environment, economy, society, food and attributes and were further divided into sub-themes. The following table clearly mentions 4 categories in which the responses were divided.

Table 1. Key Themes focused upon throughout this study

Food and Attributes	Economy	Environment	Society
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This map depicts the network for one of the sub-themes of the environment and shows all key terms obtained from the questionnaire’s responses. Figure 1 depicts urban farming as a type of sustainable agriculture with a number of advantageous environmental effects. The network mentions how urban farming leads to a decrease in transportation emissions and results in the conservation of fossil fuels. It emphasizes resolving environmental concerns in urban areas, such as water scarcity.

Since urban farmers utilize water-saving techniques like drip irrigation and rainwater harvesting, moreover, because they are smaller, urban farms can control pests more effectively without using a lot of pesticides and create a healthier local ecosystem. Reducing erosion, adding organic matter, and using fewer chemical fertilizers are some other strategies for improving soil health. [4] This claim is also supported by responses in Figure 1, which show that urban farming helps in obtaining organic food and is a more efficient method of farming. All things considered, the diagram shows how urban farming can significantly enhance environmental sustainability by mitigating transportation emissions, conserving water, reducing pesticide use, fostering biodiversity, and promoting soil health. In addition to these elements, urban farming is identified as a means to reduce food waste by directly selling

produce to consumers, combating the urban heat island effect, and engaging communities, fostering awareness of sustainable agriculture and environmental protection. This comprehensive approach positions urban farming as a transformative force for positive change in the food system and the environment.

Furthermore, the responses use the term “green” frequently and create a pattern which suggests that they relate environmental practices with the production, preservation, and protection of some form of vegetation and natural resources. This observation can be supported by external research papers which state that the term “green practices” refers to actions which are taken to improve the environment.[8] Such utilization of this terminology is often observed in business sectors which have reinforced this notion by plastering the word “green” to any machinery they use or produce. However, this also causes the term to become a vague generalization and portrays how the respondents only have a superficial understanding of urban farming.

The following networks represent the various categories in which responses can be divided amongst economies. There are 5 categories, which include Local Food Production and Food Security, Job Creation and Economic Revitalization and Education, Technology, and Innovation in Farming. Local Food Production and Food security entail responses which depict how urban farming can help grow the supply chain of agricultural goods and help utilize resources to achieve greater efficiency. Since it includes responses which talk about how urban farming increases nutrition, utilizes unused space/land, and grows the supply chain. By utilizing unused land, resources are allocated more optimally; hence, greater efficiency is achieved. By increasing nutrition, the benefits availed by consumers by consuming these agricultural goods increase and they are healthier.

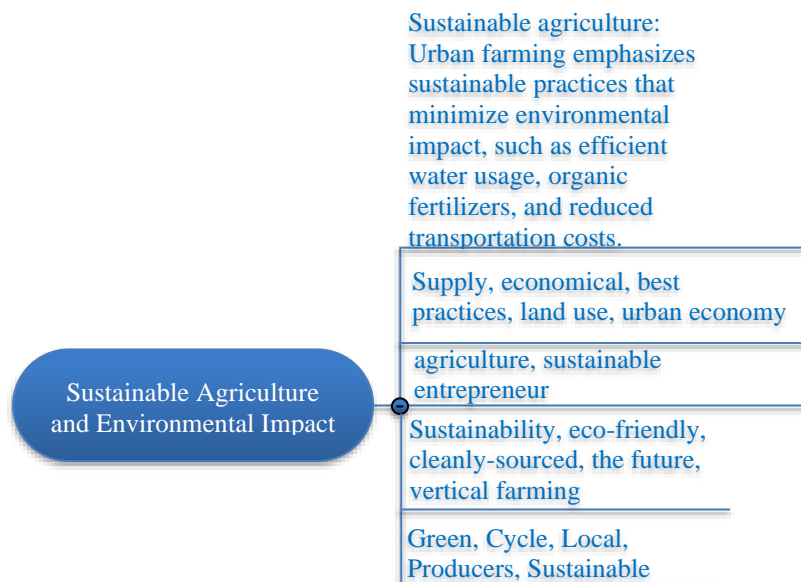


Fig. 2 Concept map of Sub-theme- Sustainable agriculture and environmental impacts

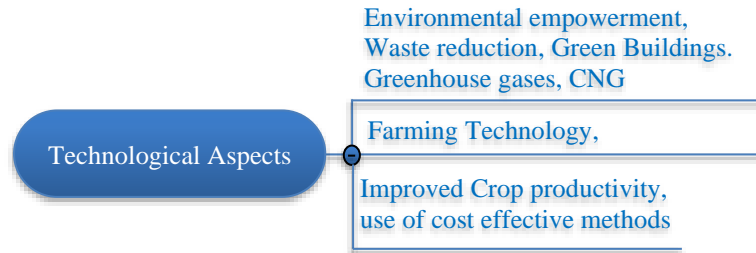


Fig. 3 Concept map of Sub-theme- Technological aspects

Moreover, it also talks about how urban farming can grow the supply chain and address local food needs to improve the welfare of the economy. Job Creation and Economic Revitalization refers to how urban farming helps people in urban areas gain new skills like farming. Thus, it helps generate employment, which increases the total output of the economy as more workers will be producing crops via urban farming. Hence, the total output of the economy increases over time and economic growth is achieved. It also creates employment opportunities, as stated by respondents, such as a person who used the key term sustainability entrepreneur. By creating such opportunities, urban farming can also help reduce unemployment in the economy.

The category Education, Technology, and Innovation in Farming signifies how technological and scientific advancements are made due to the idea of urban farming itself. For example, aeroponics and hydroponics were not as extensively researched as they are now since they were not as applicable in real-life scenarios earlier.

However, urban farming has helped improve farming techniques and technology to increase the productivity of the agricultural market by researching how to grow crops and the smallest areas of land available in urban areas.

Technological aspects refer to the effect of Urban Farming on new technological advancements, which enable obtaining greater efficiency and lead to an increase in productivity, as well as quality of crops.

These responses also relate to the idea of using technology to reduce the wastage of resources and how urban farming influences such technological advancements. The responses also do not mention any negative impact of technological advancements, even though industrial sectors.

Moreover, technology has already been considered as a tool to optimize waste management by the European Environment Agency. [8] Additionally, another study involving 72 different urban farms to assess their capabilities with respect to food production also shed light on some of the ways in which urban farming reduces the wastage of resources. The study also highlights that urban farms and gardens in the sample used a variety of inputs, with most being organic, such as manure for fertilizers. This emphasis on organic inputs can contribute to resource efficiency by reducing the reliance on synthetic chemicals that may have a higher environmental impact. [9] Firstly, the study indicates that well-managed urban farms can achieve yields that exceed those of conventional counterparts. This suggests that urban farming, with its technologically advanced aspects like hydroponic systems or plant factories, can be productive and efficient in utilizing resources to generate food.

Moreover, it also highlights that urban farms and gardens in the sample used a variety of inputs, with most being organic, such as manure for fertilizers. This emphasis on organic inputs can contribute to resource efficiency by reducing the reliance on synthetic chemicals that may have higher environmental impacts. Thus, by relying on organic inputs they can improve the quality of food that is produced and reduce wastage of resources in urban farms.

This network talks about one of the economic factors influenced by urban farming practices, which is the production of food and crops. Furthermore, it also refers to the idea that urban farming can help in utilizing resources more optimally. One of the networks talks about the benefits of urban farming such as generating employment of labor and land.

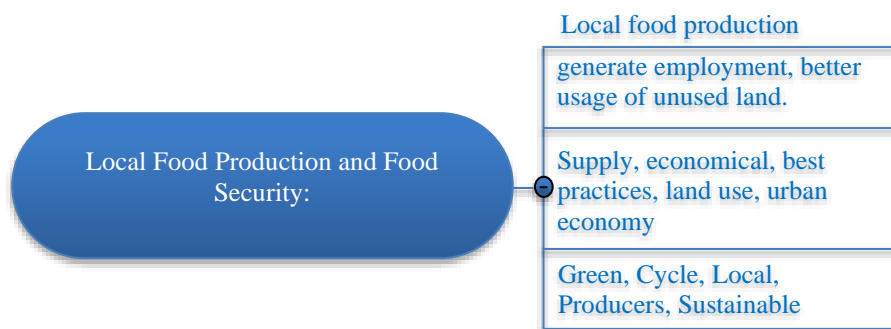


Fig. 4 Concept map of Sub-theme- Local food production and food security

The response utilizes several business related terms, hence highlighting the economic aspects which are influenced by urban farming practices. Furthermore, the respondents also showcase a certain level of awareness regarding the implications of urban farming in the economy. They explain how it influences the local food businesses by generating employment and improving productivity by making the supply chain more secure. However, it also displays their lack of awareness since some responses imply that urban farming requires land in the same quantities as urban farming. Therefore, this concept map reinstates the lack of awareness of people in urban cities with respect to urban farming.

For the responses to this theme, there is also a negative network which expresses a conflicting opinion compared to all other responses. It emphasizes how urban farming is expensive, requires a certain amount of storage space and also mentions viability as a key-term, which can be inferred as an attempt to question the feasibility of urban farming practices.

Responses related to the respondents' perception of urban farming with respect to society were categorized into the sub-themes Community Engagement and Education and Awareness. The sub-theme of community Engagement entails quotes which state or explain how urban farming can create social integration amongst communities by creating public farming places such as greenhouses accessible to everyone. Hence can also help people interact with each other and improve their mental health, which was mentioned in one of the responses to the questionnaire. Education and awareness mainly represent the benefits which can be availed by practicing urban farming in the long run since urban farming functions as a medium to inform the younger generation about farming, which is also one of the oldest and most respected jobs that require extremely rigorous work to complete.

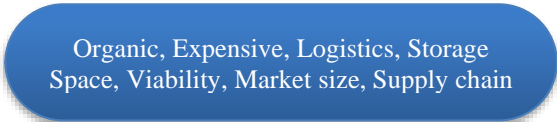


Fig. 5 Negative network

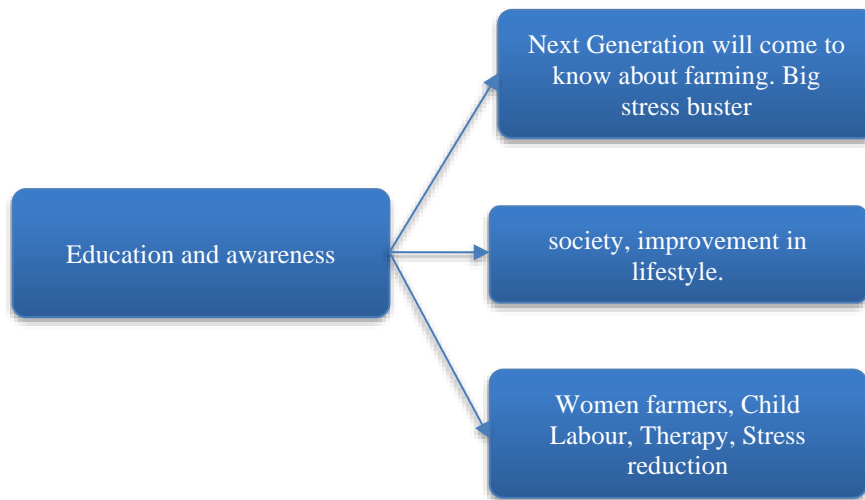


Fig. 6 Concept map of Sub-theme- Education and Awareness

This diagram is a coalition of ideas which suggest that urban farming will help improve the socio-economic aspect of communities. However it also underscores the link between urban farming and mental health, hence is categorized under society. According to a study, urban farming raises awareness about the importance of farming, food production, and sustainability. By participating in farming activities, individuals can gain firsthand experience of the effort and skill required to grow food, leading to a greater appreciation for the food system. This hands-on approach to farming can educate people about the value of fresh, locally-grown produce and the environmental benefits of sustainable agriculture practices.

Urban farming allows individuals to grow culturally relevant foods that may not be easily accessible in supermarkets. This aspect is particularly important for migrants and refugees who can connect to their cultural food

and growing traditions through gardening. By preserving and promoting cultural heritage through farming practices, urban agriculture can create a sense of identity and belonging for diverse communities. This statement also connects with responses which claim that urban farming can help the next generation learn and respect farmers and understand their relevance.

Moreover, urban farming can help cultivate school gardens and teach students about nutrition and its relevance in their lives. It also increases environmental awareness amongst students as they learn how to take care of crops and various forms of vegetation. In fact, these student service-learning approaches help students who engage in gardening activities show improved performance in science, develop a deeper understanding of academic subjects, and exhibit higher levels of school engagement. In addition to academic knowledge, urban farming helps students develop essential

life skills such as teamwork, communication, leadership, and problem-solving. These skills are transferable to various aspects of their lives and prepare them for future academic and professional endeavors. Lastly, urban farming also focuses on skill development in diverse areas such as gardening, sustainability, leadership, communication, and teamwork. Participants acquire practical skills that are applicable to various aspects of their personal and

professional lives, enhancing their employability and overall competence. [11]

The responses in this sub-theme also reinforce the idea that urban farming will pave the way in the future and generate several benefits in the long run with respect to the various aspects of a community, which include the people's jobs, well-being and other dynamics of society.

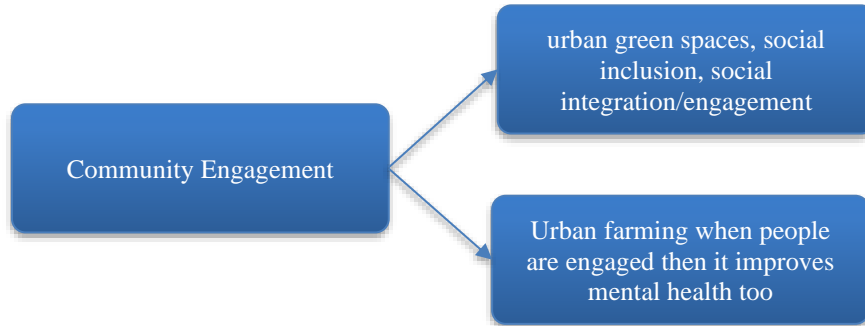


Fig. 7 Concept map of Sub-theme-Community engagement

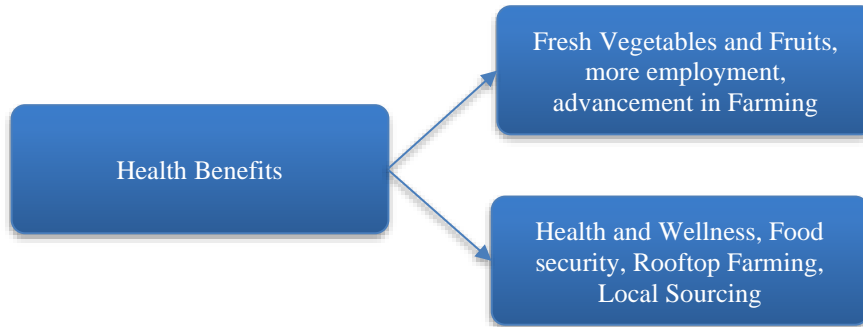


Fig. 8 Concept map of Sub-theme-Health benefits

This map depicts how Urban farming can lead to greater social inclusion and enable communities to become closer and more united. The following maps are from the last category of food and attributes. Additionally, according to a study which collected data from agricultural sites located in over 57 countries, urban farming is able to improve community cohesion. Even in schools, participation in school-based gardens and urban farming projects has been associated with increased academic engagement.

Urban farming fosters social-emotional growth by promoting teamwork, collaboration, and communication skills among students. Working together in a garden setting can enhance students' social interactions, empathy, and sense of community belonging. Practicing such techniques can also lead to the creation of community gardens. These places celebrate diversity and cultural identity by providing a space for individuals to share their traditions, knowledge, and experiences with others, increasing the level of social integration. Community gardens often reflect the cultural heritage of participants, fostering a sense of pride and connection to one's roots. Lastly, urban farming offers opportunities for skill sharing, knowledge exchange, and learning among community members. Participants can learn

from one another, acquire new skills, and engage in lifelong learning experiences. [11]

This category encompasses various aspects such as the perceived health benefits of urban farming produce, the freshness of the food, convenience, and attributes related to the quality of the food produced in urban farming settings. Attributes referring to the quality of the food produced in urban farming settings refer to the characteristics or qualities of the food that are associated with its production in an urban farming environment. These attributes may include freshness, taste, nutritional value, safety, and other qualities that consumers associate with the food produced through urban farming. This category only has two sub-themes, which can be diagrammatically represented using the concept maps shown below.

This network emphasizes one of the ways in which urban farming improves health and well-being. The map illustrates how urban farming can result in more fresh fruits and vegetables being available. The reason for this is that produce may travel shorter distances from the farm to the table thanks to the proximity of urban farms compared to conventional farms. Since fruit loses nutrients over time

when it is delivered large distances, fresh produce is typically more nutrient-dense.

Furthermore, compared to traditional farms, urban farms may frequently grow a greater variety of vegetables, which can increase people’s options for eating healthily. [12] According to the data collected from over 57 countries, The health benefits of urban farming are multifaceted and can have a positive impact on individuals and communities. Urban farming increases the availability of fresh fruits and

vegetables in areas where access to healthy food options may be limited. This can help address food deserts and improve overall nutrition. Furthermore, Studies have shown that participation in urban farming activities can lead to an increase in fruit and vegetable intake among individuals, promoting a healthier diet. In terms of physical health, practicing urban farming can also lead to a fall in an individual’s BMI (Body Mass Index) by 7%.

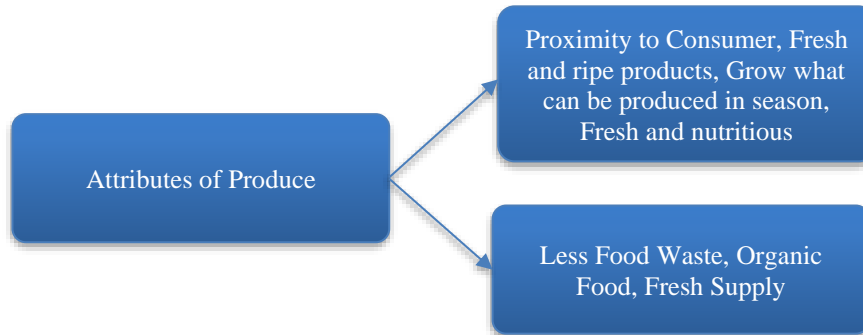


Fig. 9 Concept map of Sub-theme- Attributes of produce

This diagram portrays the various characteristics of the produce received by employing urban farming practices. This produce can be any fruit or vegetable which is grown and harvested by urban farmers. Furthermore, the diagram implies that urban-farmed fruits and vegetables are extremely fresh, flavorful and nutritious. They offer a wider seasonal variety thanks to their proximity to consumers.

In the case of environment, there are 2 sub-themes named Positive Environmental Practices and Impact Monitoring and Mitigation Measures. Positive environmental practices include quotes which talk about possible environmental benefits of practicing urban farming, such as lowering carbon footprint and improvements in air quality. At the same time, the other sub-theme includes quotes which present the idea of urban farming as an action toward reducing pollution and working towards sustainable development.

4. Conclusion

The primary data obtained from the questionnaire suggests that urban farming has a variety of advantages. Firstly, the word green is used by many individuals to describe urban farming practices, hence implying that it is a positive environmental practice. However, this form of utilization of the word green is often used by firms to improve their public image by sticking it like a label to the products they manufacture. Therefore, by describing urban farming with an extremely generic word, the individuals also show their lack of awareness and understanding with respect to its significance in urban communities.

Furthermore, urban farming prompts scientists to find new and more efficient ways of producing crops on much smaller land compared to traditional farms. Since scientists

invest more in determining innovative techniques to grow food, such as hydroponics and aeroponics, which leads to advancements in technology, or they potentially modify traditional ways of farming, such as irrigation, which also results in technological advancements. It also creates a larger impact on urban communities as a whole since individuals living in urban areas are then able to understand how to reduce the wastage of resources in general. By growing the produce in urban areas, it doesn’t need to travel long distances, possibly causing its nutritional value to deteriorate. Furthermore it helps in creating more environmental benefits by lowering carbon emissions in the process. Urban farming can also help create more employment opportunities since almost anyone in urban areas can practice it. Since urban farms are less dependent on weather conditions, they can become an environmentally as well as economically sustainable business. It also helps urban communities be less reliant on farms far away near the countryside for one of their basic necessities, hence also improving the food security in urban areas by safeguarding their food supply if any natural disasters such as droughts and floods cause crops to be unable to grow in conventional farmlands. Therefore improves the socio-economic aspects of urban communities as well. Urban Farming can be incorporated into the school curriculum to help children develop a greater understanding of their respective academic subjects while understanding the relevance of positive environmental practices from a young age.

Although the study presented many insightful findings, it also had several limitations. The primary data sample size for this study was small, with qualitative data collected from only 20 individuals. The questionnaire didn’t differentiate in the educational background comprehensively, even though its purpose was to see the level of awareness of the

individuals with respect to urban farming. The respondents may have given more socially desirable answers than what they really thought with regard to the questions. For instance, all respondents unanimously stated that urban farming is a positive practice, while some might not have thought so. The methodology also had some limitations in the ways in which the data was represented. Since the concept map didn't clearly indicate what the nodes are and

what is the central idea, it had to then be explicitly stated along with each diagram. Moreover, some findings or interpretations were supported by only 1 or 2 pieces of external literature, whereas others had more extensive and corroborative evidence with 3 or more different external research papers. This difference made some findings more relevant than others, which was not an intentional outcome of this study.

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