



BENGALURU CASE FOR URBAN TERRACE FARMING: A FEASIBILITY STUDY

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ABSTRACT

Gardien Foods was created by a group of undergraduate students pursuing B.Com. at Jain deemed-to-be University trying to be carbon neutral by 2030 with the goal of reducing Bengaluru's home spaces carbon footprint and fostering a healthy society. In order to determine the conditions necessary for the establishment of urban terrace farms in Bengaluru city, the research concentrated and evaluated the environmental, social, political, economic, civic, and public health consequences of urban terrace farming. To construct economic models for prospective farm implementations, we examined the costs of an urban terrace farm. We were able to evaluate the potential of urban terrace farming through research and interviews, and we gave suggestions for how to further advance urban agriculture in the neighbourhood.

In our idea, we looked at urban terrace farming's, numerous economic, social, political, and environmental effects in Bengaluru. Through this investigation, we aimed to find methods for locating markets, acquiring facilities, choosing crops, running the farm, engaging the local population, and a host of other duties required for the reality of urban terrace farming. We were able to determine the basic needs for the development of urban terrace farming in Bengaluru by examining the various components and to provide recommendations to help support the implementation of urban terrace farming projects.

Keywords: Farming, terrace gardening, crop farming, market, climate

HOW MIGHT URBAN TERRACE FARMING RESEARCH BE CONDUCTED?

For the purpose of concluding this comprehensive analysis of urban terrace farming in Bengaluru, we selected five objectives that necessitated investigation:

1. To create a commercially viable urban terrace farming system by identifying potential markets and practical business strategies.
2. Analysing the economic viability of the urban terrace farming programmes in Bengaluru.
3. Determining the conditions necessary for an effective urban terrace farming, including the location, farm operation, crop selection, and workforce organisation.
4. Examining the potential impact of local legislation on the concept of urban terrace farming.
5. Locating organisations and individuals who could take part in projects for urban terrace farming.

We did a preliminary literature review to comprehend all the elements of urban terrace farming initiatives in order to meet these aims. Then, we expanded on this research by enquiring residents and reviewing the data in websites. This internet study gave information about urban terrace farming. In addition, we looked into prices for urban terrace farming components. We also looked into other practical issues, like the specifics of regional laws and climate patterns, as well as potential ways to finance an urban terrace farming through grant schemes. We spoke with some of the representatives of already into urban terrace farming, restaurant owners, and social organisation leaders to get a more thorough understanding of urban terrace farming.

In order to accomplish these goals, we conducted a preliminary literature research to understand all of the components of urban terrace farming efforts. Then, we furthered this investigation by interviewing locals. Additionally, we reached out to urban terrace farmers all around the world and carried out email interviews and surveys. Our research gave us the opportunity to gather several points of view in order to fully comprehend all aspects of urban agriculture activities. Additionally, we reached out to urban terrace farmers all around the world and carried out email interviews and surveys. Our research gave us the opportunity to gather several points of view in order to fully comprehend all aspects of urban agriculture activities.

WHAT HAVE WE DISCOVERED?

We were able to obtain insight into the economics, logistics, and social ramifications of the urban terrace farming notion inside Bengaluru after researching the numerous sides of urban terrace farming. Our team looked at the various revenue sources and expenses related to urban farming. We also looked at the technical aspects of setting up an urban terrace farm, such as the legal procedure, location identification, physical infrastructure, and crop choice. The team also looked at the social aspect by identifying the ways that residents of the community interact with urban terrace farming and by considering the possibility that it could help the community advance social concerns.

Economically, we discovered that urban terrace farming farms need to use a variety of income sources, which ought to include CSAs, farm stalls, and restaurants. When analysing the business plans of urban terrace farming, our team discovered this pattern.

In these studies, we also discovered that urban terrace farming needs private finance and few grants to pay the start-up and initial operating costs; these costs are mostly determined by the variable size and infrastructure of the space available at the terrace. We looked at the logistics of crop choice, infrastructure, location, and regulations for urban terrace farming.

On the regulatory side, it became clear that many restrictions are vague because these efforts are still relatively new, making the legal procedure difficult. Additionally, operations on rooftops provide unique difficulties. Since there isn't much undeveloped land in Bengaluru, rooftops offer the most opportunity for urban terrace farming, but they also have the greatest requirements and restrictions.

In Bengaluru, rooftop farms need more than simply a set of rules; they also need reinforcements, elevators, and fencing. Urban terrace farming in Bengaluru would also probably need irrigation and growing sets to develop their output and also to safeguard sensitive crops from the city's cold environment due to climate barriers.

Even though some crops can survive the harsh Bengaluru climate on rooftops, they are sometimes not the most profitable choices. Climate, resource accessibility, and yield must all be considered throughout the crop selection process in urban terrace farming; nevertheless, market demand is frequently the most crucial element. Last but not least, we discovered that urban terrace farming is connected to social missions rather than lucrative business models from the local community.

Residents or participants who are interested frequently take advantage of this chance for community involvement. Residents of urban terrace farms can communicate with one another and improve their quality of life through volunteer activity. In addition to being an environmentally friendly venture that is economically viable, they can also include social missions.

We created case studies as an extension of our company concept that detail the fundamental logistical and financial factors involved with starting an urban terrace farming enterprise. We primarily concentrated on four

key elements when performing these case studies: viability stream, revenue stream, volunteers, and greenhouses.

We observed the revenue sources and viability stream of rooftop farming development in Bengaluru. We looked at whether it should be the volunteers or the locals for economic viability because we saw who would be volunteering the terrace farming. Finally, we looked at farms that may employ greenhouses to lengthen their growing season and enhance production. We may illustrate a variety of economic scenarios for a 15 square metre rooftop farm in Bengaluru by adjusting these elements.

WHAT WILL BE THE NEXT PHASE OF BENGALURU'S URBAN TERRACE FARMING?

We identified three overarching recommendations to encourage urban terrace farming within the Bengaluru community after looking at all of these aspects of urban terrace farming efforts.

1. Keep studying the practicalities of urban terrace farming.
2. Simplify the establishment of an urban terrace farm by developing municipal support programmes.
3. Establish connections with people, companies, and social groups in the Bengaluru community.

CONTINUE TO RESEARCH THE LOGISTICS OF URBAN TERRACE FARMING

Although we have done a lot of research on the elements of urban terrace farming for this concept, there is still room for more investigation. Prospective urban terrace farmers should specifically look into their viability stream, revenue stream, volunteer opportunities, and farm infrastructure. The goal of this study is to determine the most straightforward and successful ways to sell produce using each of these profit models. In terms of crop selection, determining the advantages and disadvantages of particular crops proved to be outside the scope of our study. The next phase, in our opinion, should be market research to identify the crops that Bengaluru consumers are most interested in buying. Additionally, this study may be broadened to examine these crops' yields and market values.

Urban terrace farming initiatives would be able to determine the most lucrative crops in particular markets according to this research. A useful extension of this research would be to determine the greenhouse solutions that are both affordable and environmentally benign.

STREAMLINE THE PROCESS OF ESTABLISHING AN URBAN FARM BY CREATING MUNICIPAL SUPPORT INITIATIVES

Projects involving urban terrace farming could be facilitated by the municipality of Bengaluru. The municipality might first help in locating suitable urban farm sites by surveying rooftops to find those that are already set up for urban terrace farms. In the course of our research, we were able to pinpoint many of the qualities that a rooftop must possess in order to be suitable for urban terrace farming.

Finding the best spots for urban terrace farming is the next step. Offering incentives to building owners who host terrace farming on their roofs is another method that might be utilised to promote urban farming. Our study revealed that a significant number of urban farmers should bargain with building owners for extremely cheap or non-existent rent payments. By giving building owners that host urban terrace farming tax or utility reductions, the municipality could promote these arrangements. Finally, we advise creating a document that lists all of the laws that are relevant to rooftop urban terrace farming projects in order to streamline the legal process involved in establishing a farm. A collected document would make it possible for regulatory agencies and potential farmers to have more uniform expectations. The legal procedures involved in setting up urban terrace farming would be streamlined by this list.

ESTABLISH NETWORKS BETWEEN INDIVIDUALS, BUSINESSES, AND SOCIAL ORGANIZATIONS WITHIN THE BENGALURU COMMUNITY

To build relationships with specific residents, possible business partners, and social organisations, we advise community outreach. Our study showed that local residents play a significant role in urban terrace farming activities. As a result, we advise interacting with the community to acquire support for these initiatives and to

involve people in the establishment and management of urban terrace farming. Public programming, social media outreach, marketing initiatives, or face-to-face interactions could all be used to win support. Networking with businesses and organisations might lead to business collaborations. Many businesses run initiatives to encourage sustainability and voluntarism.

Interacting with businesses and groups that might be interested in funding or sponsoring new urban terrace farming efforts would be advantageous to the Bengaluru community and similar advocacy organisations. The urban terrace farmers should also keep networking with charitable institutions. Urban terrace farming can not only benefit the environment and the neighbourhood, but it can also be included into social welfare initiatives. Interacting with social welfare programmes frequently gives the farm a labour force while enhancing the neighbourhood. We aided the Bengaluru community in promoting urban terrace farming projects in the area by providing these recommendations. We were able to get a thorough understanding of the effects and requirements of urban terrace farming throughout the course of this research. Our ideas for advancing urban terrace farming in Bengaluru were shaped by this understanding. In addition, our comprehension of urban terrace farming techniques enabled us to develop economic simulations of possible urban terrace farming applications in this neighbourhood.

The results of these models' estimates make it abundantly evident that establishing a logistically and financially viable urban farm in Bengaluru is a doable objective. As a result, we have shown through this analysis of urban terrace farming that it is a viable business in the Bengaluru community.

CONCLUSIONS AND RECOMMENDATIONS

We were able to obtain insight into the economics, logistics, and social ramifications of urban terrace farming initiatives inside Bengaluru after researching the different components of urban terrace farming. Our team looked at the various income sources and expenses related to urban terrace gardening. We also looked at the technical aspects of setting up an urban terrace farming, such as the legal procedure, location identification, physical infrastructure, and crop choice. The team also looked at the social aspect by identifying the points of contact that residents have with urban terrace farming and by examining the possibility for urban farming to support social concerns in the neighbourhood.

From an economic standpoint, we discovered that urban terrace farming makes use of a variety of revenue sources, including CSAs, farm markets, and restaurants. When researching the economic models of urban terrace farming internationally, our team became aware of this pattern. These studies also shown that urban terrace farming relies on organisational earnings, private investment, and grants to pay for its start-up and initial operating costs, which are mostly determined by the farm's variable size and infrastructure.

We looked at the logistics of crop choice, infrastructure, location, and regulations for urban terrace farming. On the regulatory side, it became clear that many legislations are making the legal procedure difficult. Additionally, operations on rooftops provide unique difficulties. Rooftops in Bengaluru have the most potential for urban terrace farming because there is a paucity of undeveloped land, but they must adhere to stringent requirements. Rooftop farms need more than just a set of rules. Urban terrace farming in Bengaluru would probably need greenhouses in addition to conventional outdoor watering and growing setups to raise their harvest because of climate constraints. Because they prolong the growing season and shield sensitive crops from chilly environment, greenhouses are essential. Even though some crops can withstand the harsh climate, they are frequently not the most profitable choices. Urban terrace farming requires consideration of climate, resource availability, and yield, but market demand is frequently the most crucial element.

Last but not least, we discovered that urban terrace farming frequently combines social missions with successful economic models to engage the local population. The labour involved in farming is one common opportunity for this kind of communal involvement. The majority of the physical labour is frequently performed by volunteers or participants or residents in social welfare programmes, despite the fact that the majority of urban terrace farming only employs a limited number of permanent workers. Urban terrace farming can interact with the community and improve their business by engaging in volunteer activity. They are not only a financially viable environmental venture, but they can also have social missions. We were able to develop a thorough understanding of the effects and requirements of urban farming throughout the course of this research. With a

better grasp of urban farming techniques, we were able to develop financial projections for possible urban terrace farming initiatives in this neighbourhood. In addition to comparing the profitability of various urban farming techniques, these models' projections make it abundantly evident that establishing a logistically and financially viable urban farm in Bengaluru is a feasible objective. As a result, we have shown through this analysis of urban farming that it is a viable business in the Bengaluru community.

RECOMMENDATIONS

We found three overarching recommendations to encourage urban farming within the Bengaluru community after looking at all of these aspects of urban terrace farming programmes.

1. Keep learning more about the logistics of urban terrace farming.
2. Simplify the establishment of an urban farm by developing municipal support programmes.
3. Establish contact with Bengaluru residents.

RESEARCH

Although we have done a lot of research on the elements of urban terrace farming for this project, there is still need for more study. Prospective urban terrace farmers should specifically look into farm infrastructure, crop selection, and revenue streams. Through our research, we were able to pinpoint the three marketing techniques used by urban terrace farmers the most frequently: CSA, farm stand, and restaurant partnerships. We were able to look at how frequently different techniques are used as well as the many ways these revenue strategies are combined. Although these are the three primary ways for marketing fruit, there are differences between them. We looked at various CSA, farm stand, and restaurant collaborations, our research did not go as far as to examine the various ways that each of these profit-generating tactics was carried out. Therefore, we advise businesses wanting to develop urban farming, like Bengaluru, to carry out further analysis on the most effective ways to carry out each revenue strategy. The goal of this study is to determine the most straightforward and successful ways to sell produce using each of these profit models.

We were able to pinpoint the significant components and the diversity of available crops when examining crop choices. However, determining the advantages and disadvantages of particular crops turned out to be beyond of our purview. Growing the appropriate crops for the market is crucial in crop selection, as we learnt. Our team thinks the following phase should be market research to identify the crops that are in great demand in the Copenhagen market.

This study could also be broadened to examine the yield and market worth of certain crops. Urban farming initiatives would be able to determine the most profitable crops to cultivate in the niche market. Lastly, prospective urban farmers should further examine greenhouse infrastructure. We were able to identify the need for greenhouses, but looking at the advantages and disadvantages of specific greenhouse structures outside of our focus. Identifying the most economical and environmentally friendly greenhouse options would be a productive continuation of this research. Research project could look into the benefits and cons of hydroponic and aquaponic systems, as well as other strategies for safeguarding plants and extending the growth season.

MUNICIPAL SUPPORT INITIATIVES

Projects involving urban farming could be facilitated by the municipality of Bengaluru. First, the municipality's Technical and Environmental Management section might help in locating possible urban agricultural sites. This section has looked at rooftops in prior years to determine the best spots for solar panels. Similar to this, the municipality might survey rooftops to determine which ones are already set up for urban terrace gardening. Many of the qualities that a rooftop must possess, according to our research, in order to be a good location for an urban terrace farming. The following stage is to apply these criteria to rooftops in Bengaluru to find the best sites for urban terrace farming.

Offering incentives to building owners who host farms on their rooftops is another tactic that might be used to promote urban farming. According to our findings, a significant number of urban rooftop farmers need to bargain with building owners for extremely cheap or non-existent rent payments. By accelerating the farm's

initial level of profitability, this arrangement would hasten the farm's transition to an economically viable enterprise. Urban farming initiatives in Bengaluru could be developed on a wider scale by encouraging building owners to work with urban terrace farming through tax or utility incentives.

Legislation is another barrier that urban farming initiatives in Bengaluru must overcome. Urban farming efforts are still in their infancy, and as a result, many restrictions are vague, making the legal procedure difficult. We advise creating a document that lists all of the rules that apply to rooftop urban farming initiatives in order to combat this. A written document would streamline the legal procedure involved in establishing urban terrace farming by allowing for more uniform expectations between the municipality and the potential farmers.

NETWORKING WITH THE BENGALURU COMMUNITY

The importance of community outreach is one of the most important conclusions we came to from our research. Therefore, we advise to engage in community outreach to build relationships with specific citizens, possible business partners, and social organisations. These links help both start up the farming business and increase the influence of an already established operation.

Initiatives for urban farming benefit greatly from the contributions of individual residents. Our study revealed that community volunteers provide the majority of the labour for urban terrace farming. We also discovered that programmes for urban farming benefit greatly from community acceptance and support. We advise interacting with the neighbourhood's residents to solicit their support for these projects and to engage them in the establishment and management of urban terrace farming in Bengaluru. Public programming, social media outreach, marketing initiatives, or face-to-face interactions could all be used to win support.

Networking with businesses and organisations has just as much potential as networking with individuals which might benefit from interacting with businesses and groups that are considering sponsoring or funding new urban agricultural initiatives. Many businesses run initiatives to encourage sustainability and voluntarism. Including a social goal in the urban farm could aid in securing more grants and support from sectors other than those involved in environmental advocacy.

TECHNOLOGY AND SOCIETY

In addition to technical problems, urban terrace farming has a wide range of repercussions, just like when any new technology is implemented. Our team had to take into account the effects of urban terrace farming on the economy, society, politics, ecology, and public health when analysing this issue. The practical application of this multidisciplinary perspective was demonstrated by the incorporation of social missions into urban terrace farming. Urban terrace farming has the potential to be a source of employment for the underprivileged in a community when viewed from a social perspective.

Because it gives the farm access to inexpensive labour, this cooperation is profitable economically. Additionally, it creates an urban farm within the neighbourhood, advancing environmentalism. Providing this kind of work has positive effects on public health as well as politics. In order to promote new ideas that have an influence beyond just developing the most effective technical model, it is crucial to see urban terrace farming from a range of non-technical angles. As a result, Bengaluru's urban terrace farming has the potential to serve as an example of how socially conscious technological advancement may be advantageous.

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