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Adoption of terrace gardening by Urban Dwellers in Telangana state

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Abstract

India's population, set to reach a staggering 2.0 billion by 2050, amplifies the challenges of meeting heightened demands for food and energy. The consequences of this surge extend to elevated risks of hunger, poverty, malnutrition, and social instability. Urban migration compounds these issues, transforming arable land into residential spaces, and intensifying the strain on natural resources. Amidst this, the proliferation of multi-story constructions limits space for cultivating household vegetables. While population control remains a gradual process, addressing the immediate nutritional needs of the existing population becomes imperative. The study, conducted in Telangana, delves into the adoption of terrace gardening practices as a potential remedy for the urban space crunch. Findings reveal a substantial adoption rate, primarily at moderate levels (48.33%), driven by factors such as enthusiasm, a desire for chemical-free produce, and motivation stemming from cost savings. Education, health consciousness, and exposure to media, particularly through influential platforms like YouTube, play pivotal roles in the widespread acceptance of terrace gardening practices. Furthermore, the research evaluates specific terrace gardening practices, shedding light on their varying adoption levels. Potting mixture proportions and harvesting crops at recommended stages emerge as highly adopted practices, showcasing successful implementation and emphasizing their importance in fostering robust growth and optimizing yields. Conversely, certain practices like the removal of virus-infected plants rank lower in adoption, possibly due to a lack of awareness regarding disease spread. In conclusion, the study not only highlights the significance of terrace gardening as a sustainable urban agriculture solution but also provides valuable insights into the nuances of adoption among specific practices. These findings serve as a foundation for formulating strategies to navigate the challenges posed by rapid population growth and urbanization, ensuring a sustainable and resilient future for urban agriculture.

Keywords: Terrace gardening, population demands, health consciousness, adoption

Introduction

India, renowned for its high population density, is projected to reach a staggering 2.0 billion inhabitants by 2050, posing significant challenges in meeting the escalating demands for food and energy (Siva *et al.*, 2017) ^[1]. The repercussions of this population surge include heightened risks of hunger, poverty, malnutrition, and social instability. The influx of individuals from rural to urban areas in pursuit of improved prospects exacerbates these concerns, resulting in fluctuations in resource availability in the migrated regions. This relentless movement of people not only strains natural resources but also leads to the conversion of farmland into residential spaces, diminishing the available land for agricultural purposes.

The proliferation of multi-story constructions in urban settings further compounds the issue by limiting the space for cultivating household vegetables. While population control remains a gradual process, the immediate challenge is to address the nutritional needs of the existing population. The conversion of agricultural land for non-agricultural

purposes, though concerning, presents a silver lining. Urban structures, with their roofs, balconies, and other underutilized spaces, offer opportunities for vegetable production through practices such as "Roof cultivation" or "Terrace gardening," gaining popularity as health consciousness grows (Walter and Stoelzle, 2018) ^[2]. Terrace gardens have the potential to alleviate pressure on agricultural land (Specht *et al.*, 2014) ^[3] while simultaneously addressing urban food demands, contributing to environmental sustainability, and preserving biodiversity (Kumar *et al.*, 2019) ^[4].

Various advanced agricultural techniques, including hydroponics, greenhouses, and vertical farming, can be adapted to terrace cultivation, enabling high production and productivity in limited spaces. Although not every terrace is suitable for large-scale farming, smaller ones can be repurposed for kitchen gardens to cater to a family's vegetable needs. Vegetables, with their short growing periods and nutritional value, are particularly well-suited for terrace cultivation. Furthermore, overlooked spaces like

balconies can be transformed into vegetable gardens, known as "balcony gardening," providing opportunities to cultivate vegetables not readily available in the market throughout the year (Bal and Pal, 2020) [5].

Material and Methods

Conducted in the state of Telangana, this research utilized an ex-post facto research design. The cities of Hyderabad, Warangal, and Karimnagar were deliberately selected for the study, given their significant prevalence of terrace gardening practitioners. To ensure a representative sample, a proportionate random sampling technique was applied. Specifically, 60 respondents were chosen from Hyderabad, while 30 respondents each were selected from Karimnagar and Warangal, aligning with their respective population sizes. For data collection, the researcher utilized a pre-tested interview schedule and conducted personal interviews with the respondents. Subsequently, the collected data underwent coding and tabulation to facilitate statistical analysis, employing tools such as frequency and percentage.

Results and Discussion

Table 1: Distribution of respondents according to their extent of adoption (n=120)

S. No.	Category	Respondents	
		F	%
1.	Low (34-40)	15	12.50
2.	Medium (40-46)	58	48.33
3.	High (46-52)	47	39.17
Total		120	100

As indicated in Table 1, the results reveal that a majority of the respondents (48.33%) demonstrated a medium level of adoption, followed by high adoption at 39.17%, and low adoption at 12.50%. The notable adoption of terrace gardening practices, ranging from moderate to high levels,

can be attributed to various factors. These include the strong enthusiasm among respondents for terrace gardening, a desire to consume fresh produce free from chemical residues, and the motivation derived from cost savings associated with growing their own vegetables and fruits. Additionally, respondents benefited significantly from the training provided by the terrace gardening division and ongoing knowledge exchange. Factors such as high levels of education, a focus on health consciousness, and exposure to mass media, including the influence of YouTube videos showcasing successful techniques, likely played a crucial role in promoting the widespread adoption of terrace gardening practices. These findings align with previous research by Greeshma and Sreedaya (2018) [6], Aurangzeb (2019) [7], and Dhayal and Mehta (2022) [8].

The data analysis presented in Table 2 indicates that the adoption of potting mixture proportions secured the highest rank (rank 1) with a Mean score of 2.60, signifying its successful implementation. This success can be attributed to the potting mixtures providing essential nutrients for plants, promoting robust growth and productivity. Following closely was the adoption of harvesting crops at the recommended stage (rank 2) with a Mean Score of 2.59, underscoring its importance in maximizing quality, ensuring taste, and enhancing overall yield. The cultivation of suitable crops for terrace gardening (rank 3) followed with a mean score of 2.58, emphasizing the significance of selecting appropriate crops for successful growth, space optimization, and efficient resource utilization, leading to a thriving garden. Additionally, the adoption of recommended methods for pest and disease control (rank 4) received a mean score of 2.57, highlighting its role in preserving beneficial organisms and ensuring the production of healthy, chemical-free crops. Finally, the adoption of seed treatment with Trichoderma (rank 5) earned a mean score of 2.55, indicating its positive impact on enhancing plant growth and disease suppression.

Table 2: Statement-wise analysis of the extent of adoption of terrace gardening among respondents (n=120)

S. No	Statements	Fully adoption		Partial adoption		Non adoption		Total score	Mean score	Rank
		F	%	F	%	F	%			
1.	Growing of suitable crops recommended for your terrace gardening	87	72.50	15	12.50	18	15.00	309	2.58	3
2.	Implementing the practice of composting at home	81	67.50	20	16.67	19	15.83	302	2.52	7
3.	Plants afflicted with a viral infection are removed from the soil and either disposed of or incinerated	15	12.50	20	16.67	85	70.83	170	1.42	20
4.	Drainage and aeration measures in terrace gardening	58	48.33	27	22.50	35	29.17	263	2.19	13
5.	Practising treated seeds with Trichoderma	89	74.17	8	6.67	23	19.17	306	2.55	5
6.	Practising water conservation practices	19	15.83	14	11.67	87	72.50	172	1.43	19
7.	Recommended storage measures after harvesting the crop	19	15.83	20	16.67	81	67.50	178	1.48	17
8.	Potting mixture proportions	88	73.33	16	14.17	16	13.33	312	2.60	1
9.	Application of recommended doses of organic manures to your crops	82	68.33	17	14.17	21	17.50	301	2.51	8
10.	Maintaining the recommended gap at the top of the pot to allow water to sink	68	56.67	19	15.83	33	27.50	275	2.29	12
11.	Cultivation of any recommended trap crops	75	62.50	25	20.83	20	16.67	295	2.46	10
12.	Implementing the repotting practice	57	47.50	24	20.00	39	32.50	258	2.15	14
13.	Usage of recommended water absorbing materials in terrace gardening	35	29.17	58	48.33	27	22.50	248	2.07	15
14.	Practicing any monkey/rodents control methods	20	16.67	14	11.67	86	71.67	174	1.45	18
15.	Harvesting of crop at recommended stage of harvesting in terrace gardening	84	70.00	23	19.17	13	10.83	311	2.59	2
16.	Implementing any crop rotation in terrace gardening	18	15.00	32	26.67	70	58.33	188	1.57	16
17.	Following recommended depth of sowing of crops	80	66.67	25	20.83	15	12.50	305	2.54	6
18.	Usage of standard size of grow bags	65	54.17	30	25.00	25	20.83	280	2.33	11

19.	Following any seepage measures	77	64.17	27	22.50	16	13.33	301	2.51	9
20.	Adopting any recommended methods of organic pest/disease control	82	68.33	24	20.00	14	11.67	308	2.57	4

On the other hand, the least adopted practice was the removal of virus-infected plants or plant parts, ranking last (Rank 20) with a mean score of 1.42. This may be attributed to a lack of awareness regarding the potential spread of diseases from virus-infected plants or plant parts. The adoption of water conservation practices ranked 19th, with a mean score of 1.43, possibly due to perceived higher costs and time associated with such practices. Following this, the adoption of precautionary measures to control monkeys and rodents ranked 18th, with a mean score of 1.45, suggesting that respondents perceived this issue as non-significantly affecting their gardening efforts. Adopting recommended storage measures after harvest ranked 17th with a mean score of 1.48, possibly because most respondents cultivated produce based on their consumption needs. The adoption of crop rotation in terrace gardening ranked 16th with a mean score of 1.57, likely due to a lack of awareness among respondents about the benefits associated with crop rotation.

Conclusion

In conclusion, the findings indicate that a majority of the respondents (48.33%) exhibited a moderate level of adoption, with 39.17% demonstrating high adoption and 12.50% showing low adoption. The noteworthy acceptance of terrace gardening practices, spanning from moderate to high levels, can be attributed to several factors. These factors encompass the respondents' strong enthusiasm for terrace gardening, a desire to consume fresh produce free from chemical residues, and the motivation stemming from the cost savings associated with cultivating their vegetables and fruits. Moreover, respondents significantly benefited from the training provided by the terrace gardening division and ongoing knowledge exchange. Influential factors, such as higher levels of education, a focus on health consciousness, and exposure to mass media particularly through YouTube videos showcasing successful techniques likely played a pivotal role in fostering the widespread adoption of terrace gardening practices.

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