



AWARENESS & ADOPTION OF TERRACE/BALCONY GARDENING DURING COVID-19 PANDEMIC IN INDIA

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ABSTRACT

Purpose– To know the awareness & adoption of Terrace/Balcony garden during COVID-19 pandemic in India. **Design/methodology/approach** – A survey was conducted among 250 respondents who were associated with Terrace/Balcony garden in major cities of India. Chi-Square & Multiple regression model test were conducted to investigate the awareness & adoption of Terrace/Balcony garden during COVID-19 pandemic in India. **Research Findings** – we found that independent variables like solution to the pollution or environment, recycling of degradable waste & positively for health, the significant (P) values were 0.000 which was less than 0.05. So, there were positive impact of independent variables on dependent factor, awareness & adoption of Terrace/Balcony garden. **Research implications** – Company's administrators, policy makers, and agro-service companies should give more concern towards education & training program to create more people awareness regarding adoption of Terrace/Balcony garden at your home & also can highlight the environment related benefits of terrace/balcony garden to promote the concept at their home. Company's administrators, policy makers, agro-service companies should give focus on digital marketing campaign like you tube videos, Face book & digital media application to create proper awareness & adoption about terrace/balcony garden at their home. Company has good scope

to target them by providing them right information, knowledge and proper education on terrace/balcony garden. Research concluded that company may focus on various demographic factors like age, annual income & educational qualification for adoption of the concept of terrace/balcony garden at their home.

Keywords: awareness & adoption of Terrace/Balcony garden, COVID-19 pandemic, major cities of India

INTRODUCTION

In urban areas Gardening is not restricted to the front yard or backyard. People who love gardening and want to grow plants can do so in very little available space. Terraces and Balconies are the areas which are most frequently used spaces for urban gardening. In terrace/balcony gardens, many people use well-made mud platform (Raised beds) and many of them uses traditional old pots for growing plants of their choice. Production of organic fruits and vegetables or flowers, beauty of terrace/balcony, fresh air etc. is the purposes behind terrace/balcony garden. Mostly people like to grow vegetables on terrace and decorative plants in their balconies. Those people who are having large number of space wish to create more interesting gardening plans for their terrace/balcony gardens and add multiple amount of elements. Planning of garden on roof top or balcony is as similar to planning for home or building. There are many options available for people because of innovations, but there are many people who have developed the gardens successfully using traditional methods as well. Mud pots and

large containers are used by many for traditional gardens. Many are preparing compost at their own from the waste of kitchen and used it for nourishment of the plants; it just requires good care and watering at several intervals. Everyone can do it by themselves as terrace or balcony garden is not a hard task. As a base containers or mud pots you can use. From the nursery one can buy all the required things, like seeds, fertilizers, plants etc. from nursery or even online. If there is open space and sunlight, almost all types of plants can be grown on terrace garden. But balcony garden can be different from terrace garden. Generally pots are there in the balcony garden. Rose, marigold, hydrangea, dumb cane etc. decorative plants and flowering plants are most suitable to grow in the balconies. Hanging pots you can out in the gardens, terrace as well as balcony. As we all know that gardening can be one of the best hobbies that reduces your stress, it can also give you a good body exercise. But in majors city of India which is a tight concrete jungle gardening space a constraint. City life gives you necessities that you required

for easy living; it is one of the reasons why people are attracted to the cities. Major cities of India are crowded with all the concrete buildings, cement roads, multiplexes with full population. In a city it is hard to plant a tree around your home. As trees and plants give you fresh air that will refresh your mind and body. Terrace/Balcony is the space where we can have good aeration, proper sunlight and water. Terrace/balcony garden is not an expensive and each and every member of the family can spend a quality time in their own garden. Terrace/balcony garden can protect your building or premises from ambient heat. It is very easy to maintain and you can grow all types of fruits and vegetables. You just need to take good care of plants. Gardening can give you a good body exercise which will reduce your stress and increase your blood flow.

Gardening and Technology:

Gardening could be very easy. Gardening witnessed an amazing change with the advent of technology. Without any help anyone can start gardening as there is so much information available easily. Now days there are videos & digital apps also there, which guided practically as how to go for gardening. There are common interest groups also which provides a platform for connection with the people and take and give suggestions for the gardening. There are technological

advancements and innovations in the field of gardening. Before people were worried about watering plants when they were traveling but with the time everything has changed now, there are automatic irrigated systems you can install in your garden. There are many online platforms from where you can get all the requirements of your gardening. Number of start-ups also there as the entrepreneurs see the potential in the garden industry which gives services in the field of gardening and help to those who are interested in gardening irrespective of available space and time and energy they want to spend. Many websites and applications are there which provides knowledge and help required by the people. In future, one can remotely monitor a plant's health, say by researches. Automated tools will monitor various factors like, pH level, quantity of the fertilizer etc.

MATERIAL AND METHODS

Gita J Bhimani, MK Bariya, Bhakti B Panchal, (2020), [1] found easiest ways to access to adequate micro nutrients and macro nutrients is to produce and consume different types of fruits and vegetables from your own kitchen garden. In today's environment terrace and rooftop garden becoming common factors. Because of highly pesticide contaminated fruits and vegetables and excessive exploitation of urban land, now a days landscaping on

terrace and rooftop for urban horticulture has more evolved. Urban growers encouraged to produce healthy vegetables around the year as terrace/kitchen garden can supply preferential toxic free produce with minimum expenditure. The study was planned with an objective to study awareness and extent of adoption of media preparation, sowing of different vegetables in different season and pest and disease management aspect of kitchen gardening. The research was done on 100 urban kitchen growers which were selected randomly. Data collection was done by professional interview through structured schedule. Results show that majority had medium level knowledge about kitchen garden (70%) and adoption rate (55%) and high level knowledge about kitchen garden (9%) and adoption rate (20%).

Prem Jose Vazhacharickal. (2014), [9] found that the role of urban and peri-urban agriculture in reduction of urban poverty and ensuring environmental sustainability was recognized by The Millennium Development Goals (MGDs). With the population of 21 million, Mumbai metropolitan region is the fastest growing region. Food crisis has been created due to rapid urbanization and high proportion of people below the poverty line along with higher migration to Mumbai metropolitan region. With special attention towards contribution of current situation of balcony

and terrace gardens in MMR, this paper focuses in ecosystem service. Overview about various concepts for city farming was also covered. Research shows that urban and peri-urban agriculture was one of the best options to address increasing urban food demand and can serve to complement rural supply chains and reduce ecological food prints in India. Poornima,C.P., & Suryawanshi, P. D. (2020), [8] concluded on analysis of vegetable consumption pattern and health consciousness of urban people practicing terrace gardening at their homes. 90 people from Pune were selected randomly for survey. The results show that people are having either Moderate level or High level of health consciousness. While collecting details regarding general consumption pattern of vegetables, the amount of vegetables consumed per household daily was taken into consideration. 70 percent were consuming moderate amount of vegetables on daily basis found in the study.

Khapte, Pratapsingh & Kumar, Pradeep & Singh, Akath & Kumar, Praveen. (2019), [6] research shown that availability of safe, nutritious and quality food is limited due to soil and water pollution and heavy load of pesticides. By adding value to life, terrace vegetable gardening is an ideal choice which grows vegetables environment friendly as to enjoy them in aesthetic way. For leading quality and healthy life linked

to urban agriculture, it is high time to start terrace vegetable gardening. Terrace garden can provides aesthetic value, alternative to exercise and it contributes in reduction of city waste by recycling of kitchen waste into useful compost to partly sustain own terrace garden. Research shows that there in need of intensify education and various training programs for city dwellers on sustainable terrace gardening practices.

Chitra Chidambarama., Surabhi S. N., Pranjali Varshneya and Sakshi Kumar (2020), [4] concluded that in buildings hard concrete roofs causes excessive heat gain which impacts on thermal comfort. For modification of building microclimate and improving urban health, one of the best key is terrace gardening, which promotes greening at high level of structures. Research project was undertaken to quantitatively assess the value of terrace garden in residents. For this a garden size 15 m. sq. was developed. Over a period of 15 months temperature were measured by placing four thermocouple sensors. The comparison were there of thermal performance of the terrace garden across the years, seasons, time of the day, presence or absence of the garden bed and type and height of different vegetation. Results were found to correlate well with temperature values. Terrace gardens can moderate and stabilize the ceiling temperature and reduces by - in the

season of winter and - in the hot summer season. terrace garden can provides dual benefits of temperature control within buildings and urban farming.

Sofo, Adriano & Sofo, Antonino. (2020), [10] found that the Covid-19 pandemic people are facing uncertain and difficult times. During the forced isolation, benefits of plants psychological, health, economic and productive can be a key important. Many of us were isolated in urban of suburban conditions; we must have to keep our bodies and minds active. Regardless of covid-19, there is great potential for terrace/balcony garden to impact environmental outcomes, awareness in public, and trends in market. Terrace or balcony gardens can provide small scale approaches to the use of natural resources sustainably, leading towards self-sufficiency, self-regulation environment protection and sustainability.

Kishore, M & Patil, Manasi. (2015), [7] concluded that balance of nature is disturbed during to global warming and natural calamities. Some human activities are also responsible for this disturbance. Degradation of waste is also another problem additionally. Recycling of waste is very much necessary to overcome of this, like vermicomposting. To overcome much of the waste related problems, cultivation of the vermicomposting for plants as well as vegetables from terrace garden has been

workout that this is found to be very useful. As a results 800 square feet, terrace garden has been developed which includes cultivation of different flowering plants, climbers, indoor plants, cucurbits and leafy vegetables etc. this is found to be best alternate for the degradable waste.

Dash and Deole (2020), [5] found that in urban areas majority of people are living in apartments and buildings and don't have agricultural lands or garden where we can grow plants. Quality of our life was declining thus we may earn more and buying more. You can set rooftop garden by 3 ways, by covering entire surface with soil, by putting plants pots and by hydroponic systems. Almost all the vegetables like tomatoes, cucumbers, radishes, beans, chilies, gourd and brinjals can be grown. By adopting vegetable farming on terrace, it may help to meet food demand by supplying hygienic and fresh vegetables. It can reduce the household expenditure of purchasing vegetables. It can improve the quality of the air we breathe. You can also grow ornamental plants, flowers, herbs, shrubs and vegetables which is 100 percent pesticide free and organic thus contributes to nutritional security.

Bite, Bhalchandra & Deshmukh, Anand & Dresel, Hans, (2017), [2] found new upcoming area in the agricultural marketing is social media, that contains blogs, micro

blogs, pages, various groups etc. Study was adopted a primary data collection tools and structured questionnaire and depth interviews of farmers who used social media. In agricultural marketing, social media is very much useful tool, found in the analysis. For information, social media saves time and cost of farmers. For pages and profiles, Facebook found to be most likely social media tool. For information with applications, YouTube videos are most popular. For related groups, WhatsApp is most handy tools of social media. Challenges they found in the study were "Adoption of Social Media as a tool of Marketing". E-buying, E-selling of agricultural commodities on social media, people had less trusted.

Objectives of the Study;

1. To investigate the awareness & adoption of Terrace/Balcony garden during COVID-19 pandemic in India.
2. To know the association of various demographic variables like age, education qualification, income of the people and regarding awareness and adoption of Terrace/Balcony gardening.
3. To know the effect of independent variables like effect of microclimate on building/premises, solution to the pollution or environment, recycling of degradable waste & positively for health on dependent factor,

awareness & adoption of Terrace/Balcony garden.

Research Design:

Research design is a framework or blueprint for conducting a research. Research design specifies the details of the necessary procedures for obtaining the information needed to structure and solve the problem of the research. Two step methodologies were adopted for research in order to address objectives of the study. To gain better understanding about the research, exploratory research being used in first stage. For gathering data, for testing of hypothesis and validating the model, conclusive research being used in second stage.

Sampling Size:

Sample size of our research study was 250 respondents who were associated with Terrace/Balcony gardening from various major cities of India like Ahmedabad, Surat, Delhi, and Udaipur.

Sampling Methods:

To draw accurate conclusions from the data, we must carefully consider how the sample will be chosen, ensuring that it is representative of the entire population. There are two different types of sampling techniques- Probability sampling technique and Non-probability sampling technique. Instead of giving the researcher the opportunity to select sample elements, Non-probability sampling relies on

researcher's own judgment. Probability sampling procedures may not be possible in some cases when the whole population is not accessible. A Non-probability convenience sampling method was adopted.

RESULTS

Cross tabulation:

From **Table 1** of Chi-square test between

1. Annual family income and weekly expenditure on purchase of vegetables and fruits, the significance value is 0.000, which is less than 0.05. So we reject the Null hypothesis (H0) and accept Alternative hypothesis (H1). So, we concluded that there is association between annual family income and weekly expenditure on purchase of vegetables and fruits.

2. Age and preference of fresh, toxic free vegetables and fruits at your home, the significance value is .000, which is less than 0.005. So we reject the Null hypothesis (H0) and accept Alternative hypothesis (H2). So, We concluded that there is association between age and preferential fresh, toxic free vegetables and fruits at your home.

3. Age and adoption Terrace/Balcony garden at your home, the significance value is .000, which is less than 0.05. So we reject the Null hypothesis (H0) and accept Alternative hypothesis (H2). So, we concluded that there is association

between age and adoption Terrace/Balcony garden at your home.

4. Educational qualification and awareness about Terrace/Balcony garden, the significance value is .000, which is less than 0.05. So we reject the Null hypothesis (H0) and accept Alternative hypothesis (H2). So, we concluded that there is association between educational qualification and awareness about Terrace/Balcony garden.

5. Educational qualifications and to adoption of Terrace/Balcony garden at your home, the significance value is 0.000, which is less than 0.05. So we reject the Null hypothesis (H0) and accept Alternative hypothesis (H2). So, we concluded that there is association between educational qualifications and to adoption of Terrace/Balcony garden at your home.

6. Vegetables and fruits do you consumption on daily basis and level of health consciousness; the significance value is 0.000, which is less than 0.05. So we reject the Null hypothesis (H0) and accept Alternative hypothesis (H2). So, we concluded that there is association between consumption of vegetables and fruits on daily basis and level of health consciousness.

Multiple Regression Model awareness & adoption of Terrace/Balcony garden:

From **Table 2**, we concluded that R square value is 0.274. This explained the 27.4% of

the variance.

From **Table 3**, we concluded that regression model found significant because the significant (P) value is 0.000.

Research Hypotheses for testing:

H1: There is a significant impact of effect of microclimate on building/premises on dependent factor, awareness & adoption of Terrace/Balcony garden.

H2: There is a significant impact of solution to the pollution or environment on dependent factor, awareness & adoption of Terrace/Balcony garden.

H3: There is a significant impact of recycling of degradable waste on dependent factor, awareness & adoption of Terrace/Balcony garden.

H4: There is a significant impact of positively for health on dependent factor, awareness & adoption of Terrace/Balcony garden.

From **Table 4**, research showed that multiple regression analysis has been carried out between independent variables like effect of microclimate on building/premises, solution to the pollution or environment, recycling of degradable waste & positively for health and dependent factor, awareness & adoption of Terrace/Balcony garden.

Research shown that independent variables like solution to the pollution or environment, recycling of degradable waste & positively for health, the significant (P)

values were 0.000 which was less than 0.05. So we accepted alternative hypothesis which shown positive impact on dependent factor, awareness & adoption of Terrace/Balcony garden. Research shown that independent variables like effect of microclimate on building/premises the significant (P) values were 0.177, which

was greater than 0.05. So we accept null hypothesis which shown negative impact on dependent factor, awareness & adoption of Terrace/Balcony garden.

Table 1

Sr. No.	Alternative Hypothesis	Significance (P) value	Accepted/ Rejected
1	H1: There is association between annual family income and weekly expenditure on purchase of vegetables and fruits.	0.000	Accepted
2	H2: There is association between age and preferential fresh, toxic free vegetables and fruits at your home.	0.005	Accepted
3	H3: There is association between age and adoption Terrace/Balcony garden at your home.	0.006	Accepted
4	H4: There is association between educational qualification and awareness about Terrace/Balcony garden.	0.000	Accepted
5	H5: There is association between educational qualifications and to adopt Terrace/Balcony garden at your home.	0.001	Accepted
6	H6: There is association between amount of vegetables and fruits do you consume on daily basis and level of health consciousness.	0.000	Accepted

Table 2: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.523 ^a	.274	.262	.862

a. Predictors: (Constant), Positively for health, Effect of microclimate on building/premises., Solution to the pollution or environment., Recycling of degradable waste

Table 3: ANOVA^a

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	68.548	4	17.137	23.088	.000 ^b
Residual	181.852	245	.742		
Total	250.400	249			

a. Dependent Variable: awareness & adoption of Terrace/Balcony garden.

b. Predictors: (Constant), Positively for health, Effect of microclimate on building/premises., Solution to the pollution or environment., Recycling of degradable waste

Table 4: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	.791	.133		5.964	.000
Effect of microclimate on building/premises.	.081	.060	.090	1.354	.177
Solution to the pollution or environment.	.189	.068	.198	2.768	.006
Recycling of degradable waste Positively for health	.189	.068	.204	2.771	.006
	.158	.065	.161	2.429	.016

a. Dependent Variable: awareness & adoption of Terrace/Balcony garden

DISCUSSION

Company should provide more focus on Terrace/Balcony garden, as from the above analysis we can see that 88% of respondents were aware about terrace/balcony gardening at their home. So we concluded that people of urban cities of India like Ahmedabad, Surat, Delhi, and Udaipur are interested in the concept of terrace/balcony garden. 82% of respondents were like to do adoption about terrace/balcony gardening at their home. Solution to the pollution or environment, recycling of degradable waste, positively for health & preferential fresh, toxic free vegetables and fruits at your home were key factors for implementation of concept of terrace/balcony garden at their home. Company has good scope to target them by providing them right information, knowledge and proper education on terrace/balcony garden. Company should give more focus on annual family income of the people who are interested in the concept of terrace/balcony garden for weekly expenditure on purchase of vegetables and fruits.

Company should give more focus on age of the people who are interested in the concept of terrace/balcony garden and who prefer fresh, toxic free vegetables and fruits at their home. Company should give more focus on age group between 20-45 years of the people who are interested in the concept

of terrace/balcony garden and adoption Terrace/Balcony garden at their home. Company should give more focus on educational qualification mainly undergraduate and primary schooling of the people who are interested in the concept of terrace/balcony garden and awareness about Terrace/Balcony garden at their home. Company should give more focus on gender of the people who are interested in the concept of terrace/balcony garden and to adopt Terrace/Balcony garden at their home. Research shown that independent variables like solution to the pollution or environment, recycling of degradable waste & positively for health, which shown positive impact on dependent factor, education and training programs on Terrace/Balcony garden practices. So, Company's administrators, policy makers, agro-service companies should give more concern towards education & training program to create more people awareness regarding adoption of Terrace/Balcony garden at your home & also can highlight the environment related benefits of terrace/balcony garden to promote the concept at their home. Respondents used digital media apps like you tube videos, Face book & digital media application for information on home gardening. So, there is opportunity for agro services and digital media companies.

CONCLUSION

City life gives you all the necessities you required for easy living, that is the reason why people are attracted to the cities, but in the city it is hard to find a green space, pure air and fresh fruits and vegetables. Terrace/balcony Gardening can be one of the best hobby that reduces your stress, it can also give you a good body exercise and which will gives you excellent, beautiful garden that contains full greenery, beautiful flowers, fresh organic fruits and vegetables. If you are looking for such, the terrace/balcony garden is a best solution for you. The study totally has awareness & acceptance that people wants to get information and knowledge related to terrace/balcony gardens through the digital media application and application of various digital media like you tube channel's video, face book, mobile digital application and blog are willing to do better for creating awareness & adoption about terrace/balcony gardening practices at their homes.

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