

**SUSTAINABLE APPROACHES TO
COMPOST IN TERRACE
GARDENS AND ITS EFFECTS ON
THE PSYCHOLOGICAL WELL
BEING**

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ABSTRACT

Ecosystem is defined as a biological assemblage interacting with its associated physical environment located in a specific place by Tansley (1935). Our Ecosystem plays vital role for our existence as well as all for another organism in the world. Protecting it is very crucial not only for our survival but also for every single living organism in this world. Wherever we live we have that basic responsibility to protect the ecosystem by any means. Those who live in urban areas are deprived of the landscape which helps to connect us with nature but inside every one of us there is that instinct which triggers us to have minimum a small pot with a sapling. Terrace garden concepts become familiar during lockdown. Kitchen waste is used as manure for terrace garden plants by composting and there are also many online workshops conducted to teach about composting. This provided way for terrace garden's popularity and people are getting many benefits like organic fresh vegetables, aesthetic appearance for the terrace, cooling effect for the house above all it improved the psychological well being of the people positively. The main objective of the study is to find the sustainable approaches to compost and protect ecosystem in terrace gardens of urban areas and its effects on psychological well-being. Data is collected using Google forms from respondents by purposive sampling technique. ANOVA and Chi-Square is used to analyze the data using SPSS. The results show that there is positive relationship with terrace gardens and psychological well being.

Keywords: *ecosystem, terrace garden, composting, psychological well-being.*

1. INTRODUCTION

Terrace garden is a good way to improve our mental health for those who live in urban area. We can easily compost our kitchen waste and the same can be used as manure for our terrace garden. Terrace garden give us lot of benefits some are tangible and some are intangible. When it comes to mental health benefits it reduces stress, strength our connections with other people with similar interest, being in mindfulness, feeling sense of worth, reduces the risk of Alzheimer's, gives us good body structure and strengthens our immune system. Mycobacterium vaccae, a soil bacterium will help us to improve our immune system and also reduces depression as per research studies.

2. PROBLEM STATEMENT

To find the sustainable approaches to compost and protect ecosystem in terrace gardens of urban areas and its effects on psychological well being

3. OBJECTIVES OF THE STUDY

To find the sustainable approaches to compost in terrace gardens. To find the association between terrace gardens and psychological well being. To find the difference between educational qualification and psychological well-being.

4. REVIEW OF LITERATURE

Positive effect of nature connectedness:

Previous research studies says that people who are involved to protect the natural environment by gardening and developing natural environment are positively influenced and shows increased subjective well being. More research studies need to be done in

this area to prove this association. If people involved in protecting natural environment shows improvement in well being it will have a double benefit, first for preserving our natural environment and secondly for the development of human kind (Ginkel, 2020) Nature connectedness may increase the well being by

motivating people's need to be with nature and also to include many varieties in their gardens. Research study also shows there is positive effect on well being because of human beings need to connecting with nature (Samus, 2023).

Intention to recycle: Theory of planned behavior

Theory of planned behavior was framed by adding perceived behavioral control from the reasoned action theory. Theory of planned behavior is widely used to tell about different aspects of human behavior and is recognized as one of the most important theories for studying social and psychological behaviors. Theory of planned behavior says that human beings act logically by outwardly or inwardly by calculating the output of their behavior. This theory of planned behavior postulates three main factors. They are attitude, subjective norm and perceived behavioral control to predict behavioral intention. As per this theory if a person has a good attitude, subjective norm and perceived behavioral control then he will show a good behavioral intention. Researchers like Wang, Mak, and Abbasi employed this theory to study the behavioral intention of people in areas like the impact of environmental awareness norms, recycling, intention to recycle, awareness of consequences, economic incentives and to explore the intention to revisit a destination (Rahman 2022). All these research studies show that people when they are aware of the consequences of growing terrace garden and its effects on psychological well being they will positively exhibit the behavior which is helpful both for them as well as for the society.

Relationship of human well being with nature: Theory of Biophilia.

Edward O. Wilson (1984), a well-known biologist described Biophilia as an "innate tendency to focus connections on life and life-like processes".

He has written about this in his book in 1984 but originally German philosopher and psychologist Erich Fromm used it as “the passionate love of life and of all that is alive” in 1964 itself. In 1993, Stephen R. Kellert used the hypothesis as the relationship of human emotional reaction to nature in many dimensions. All these studies show that the theory of Biophilia is covering wider aspects and it interprets the relationship of human well being with nature (Ozturk Sari. S 2023)

Advantages of Compositing:

Composting is converting different decomposable wastes into outputs which can be used as organic fertilizers. The composting process paves way to ensure that underground water is safe from pollutants. Due to composting there is control of microbes and chemical pollutants which are dangerous to people. The advantageous microbes remove the chemicals during composting. (Ayilara 2020)

Ornamental Plants remove Stress:

During pandemic people were affected worldwide but those who were growing ornamental plants were positive emotionally because it is considered as one of the practices for reducing anxiety and stress in human beings. To support this research result it is necessary to grow ornamental plants with more research studies in places where people are stressed. Particularly it can be used to solve different problems by growing ornamental plants since it reduces the negative emotions (Turkoglu 2023)

Terrace gardens and Psychological Well Being:

Terrace gardens improve the creativity and psychological benefits for the urban people. Also terrace gardens changes the physical view of the houses, provides privacy from neighbors and hides unwanted pipeline and also unattractive appearance. In city shops the quality of the vegetables is questionable and also kitchen waste

can be recycled are the main reasons for these terrace gardens (Kalyan 2020).

Benefits of Terrace Gardens:

Terrace gardens improve the physical activity, social interaction and exposure to nature and Sunlight. Blood pressure is lowed with exposure to sunlight and increase Vitamin D level. Terrace gardens give us fruits and vegetables that have a good impact on the nutrition. Terrace gardens burns same number of calories as one might get working in gym. It also restores dexterity and strength. More calories are burnt by digging, raking and mowing in terrace gardens. Social isolation can be removed for those people with learning disabilities and poor mental health by the social interaction done in communal and therapeutic garden projects (Thompson 2018). Psychological well being, purpose of life, social interaction, interpersonal relations, personality development, new perception about the environment, social roles and quality of life are associated with terrace gardens (Triguero-Mas 2020)

Protecting Ecosystem with Terrace gardens:

Terrace gardening is the easy solution for fast growing urbanization and food adulteration to stay healthy with healthy food and also to protect our ecosystem by including nature into one’s environment. We should keep the ecosystem in good condition and it is our responsibility because only our children and grandchildren will be living on this Mother Earth (Thunam Srikanth 2022)

5. RESEARCH METHODOLOGY

Primary data is collected from 246 respondents using Google forms by purposive sampling technique. First the target population who are having terrace garden is identified and Google forms are circulated to them and also to the people who don’t have terrace garden. Data analysis is done using ANOVA and Chi-square in SPSS.

Questionnaire used to measure psychological well being- 18 item scale is developed by psychologist Carol D. Ryff (1995). Ryff scale consists of six factors: autonomy, environmental mastery, personal growth, positive relations with others, and purpose in life and self-acceptance. Total score if it is high it shows increased psychological well being.

In addition, questions for demographic factors, and open-ended questions are given to know about the respondent's interest in terrace garden, types of plants they grow in terrace and also their methods of composting in terrace garden. Respondents are also asked to give their suggestions to improve terrace garden in urban area.

6. DATA ANALYSIS AND INTERPRETATION

6.1 Terrace Garden and Psychological Well Being

H1: There is significant association between terrace garden and psychological wellbeing.

Chi-Square Tests			
	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	87.37	44	0
Likelihood Ratio	110.79	44	0
Linear-by-Linear Association	15.49	1	0
N of Valid Cases	276		

a. 61 cells (88.4%) have expected count less than 5. The minimum expected count is .01.

Interpretation:

The Pearson Chi-Square value is significant. So, the null hypothesis is rejected and the alternative hypothesis is accepted.

There is significant association between terrace garden and psychological well-being.

Symmetric Measures			
		Value	Approximate Significance
Nominal by Nominal	Phi	0.56	0
	Cramer's V	0.4	0
N of Valid Cases		276	

Phi and Cramer's V values are .563 and .398 which shows terrace garden is positively associated with psychological well-being.

H2: There is significant difference between Educational Qualification and psychological well-being.

Descriptives								
Psychological Well Being								
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1	48	3.7	1.17	0.17	3.36	4.04	2	5.44
2	60	3.9	1.32	0.17	3.56	4.24	2	6.22
3	96	3.85	1.27	0.13	3.59	4.1	2	6.33
4	72	3.68	1.15	0.14	3.41	3.95	2	5.56
Total	276	3.79	1.23	0.07	3.64	3.94	2	6.33

Interpretation:

Out of 276 respondents 48 are having Higher secondary/School education,60 are graduates, 96 are post graduates and remaining 72 are with different qualification and coming under Others category.

Test of Homogeneity of Variances					
		Levene Statistic	df1	df2	Sig.
Psychological Well Being	Based on Mean	0.52	3	272	0.67
	Based on Median	0.64	3	272	0.59
	Based on Median and with adjusted df	0.64	3	271.04	0.59
	Based on trimmed mean	0.53	3	272	0.65

Interpretation:

The Levene Statistic values are insignificant. So, the data is homogeneous.

6. OBSERVATIONS FROM FIGURE 1:

1. The attrition rate is 16.12%, within the chosen sample space.
2. About two-thirds of those are male employees. However, this is proportional to the overall gender distribution of employees in the chosen sample, with attrition rate within males being 17% and within females being 14.8%.
3. Age wise, the highest attrition is in the 18-27 group (about 28.09%) and the lowest is in the 38-47 group (about 9.36%). At the 18-27 group the attrition rate in females is slightly higher at 29.11% (compared with 27.48% for males) and at the 38-47 group the attrition of males is significantly higher at 9.09% compared with 6.42% for females.
4. The attrition rate correlates with the travel of employees, with employees self-reporting as “travels frequently” having an attrition rate of 24.9%, and employees who report as “travels rarely” having an attrition rate of 14.9%.
5. The attrition rate initially correlates with the number of years the employee has spent with the company, with the attrition rate being 32.9% for those who have been with IBM for less than 5 years, dropping down to 5% to those who have been in IBM for 25 to 30 years, before rising again for employees having been in IBM for more than 30 years, reaching a maximum of 12.5% for 35-40 years.
6. Prior experience also correlates with attrition, with those who have worked with 5 or more companies before being about twice as likely to leave the company.
7. The attrition is predominantly in the sales and R&D departments, with a minute percentage from HR. This reflects the overall departmental breakdown of the sample space; if weighted by department population the attrition in R&D is only 13% whereas it's close to 20% in both sales and HR.

8. Satisfaction surveys correlate strongly with attrition, with job satisfaction, environment satisfaction and relationship satisfaction all showing a pattern of anyone self-reporting least satisfied (1) having twice the attrition rate of those reporting most satisfied (4). By contrast, there seems to be little difference among those reporting 2, 3 or 4 in satisfaction survey regarding attrition.

Addressing Attrition

Armed with these insights, IBM has taken proactive measures to address attrition. Firstly, they have focused on creating a culture of continuous learning and development, providing employees with ample opportunities to upskill and advance their careers within the organization. By investing in training programs and internal mobility initiatives, IBM aims to retain top talent and enhance employee engagement.

IBM has also made efforts to improve work-life balance and job satisfaction by implementing flexible work arrangements and well-being initiatives. Recognizing the importance of strong managerial relationships, the company has enhanced leadership training programs to equip managers with the skills needed to support and motivate their teams effectively.

Being proactive to address the general issues that is most common cause to attrition, IBM has created number of employee engagement and retention programs. For instance, the organization offers training, coaching, and career growth possibilities for employee development. In order to promote work-life balance and employee wellbeing, IBM also provides flexible work schedules, WFH, and other benefits.

Also, more importantly, Measuring the impact - An ongoing HR analytics study monitors the impact of these initiatives on attrition rates. By collecting data on attrition levels post-implementation, IBM can

ANOVA					
Psychological Well Being					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.32	3	0.77	0.508	0.68
Within Groups	413.78	272	1.52		
Total	416.1	275			

Interpretation:

The F value is insignificant so the null hypothesis is accepted. There is no difference between educational qualification and psychological well-being.

7. FINDINGS

From the above analysis and interpretation, the findings are:

There is association between terrace garden and psychological well-being. So having terrace garden is positively associated with increasing the psychological well-being.

There is no difference between educational qualification and psychological well-being. So psychological well-being is not showing any difference because of different levels of educational qualification.

Respondents are growing medicinal plants, flowing plants and vegetables and greens in their terrace gardens.

Some of common plants they grow are medicinal plants like Tulasi, Alove vera, Hibiscus, Mint, Thoothuvalai etc, flowing plants like Rose, Jasmine and vegetables like Brinjal, Ladies finger, Pumpkin, Sweet potato, Tomatoes, Chillies, Ginger.

8. SUGGESTIONS

Respondent's suggestions for composting in terrace garden:

Mix the kitchen waste with coco peat and sand in a closed container for some time and use it.

Use Compost bin and fill the kitchen waste and sand layer by layer.

By drying the kitchen waste in sun and storing them for future use.

By soaking the kitchen waste in water and using it for terrace garden.

Respondent's suggestions for improving terrace garden:

Choose plants based on the purpose like medicinal plants or flowing plants or vegetable plants

Daily maintenance is important

Check whether the roof is strong and take proper precautions before keeping plants in terrace.

Use stands to keep the pots properly.

Start from small plants and gradually increase the pots.

Use organic fertilizers instead of Chemical fertilizers.

Cleaning and watering the plants is very important on daily basis.

9. CONCLUSION

Gardening connects us with nature and improves our psychological well-being. At the same time, we can do composting in a small scale from our kitchen waste which is very important for sustainable development of our ecosystem. Everyday working in garden burns the extra calories which reduces the risk of obesity. As per pervious research studies watering the plants improve our Heart function also improves psychological well-being. We inhale good oxygen when we are working in our terrace garden. Also, we get Vitamin D naturally by exposing to sunlight in terrace garden.

Terrace garden gives us many benefits like organic vegetables and greens fresh from our terrace to kitchen. Terrace garden is like our window to outer natural environment and frees us from the stress. We can learn gardening in a natural way by starting slowly with small plants and within inside of everyone we have a gardener. We will also get the satisfaction of doing our part to protect the ecosystem for future generation by this terrace garden and composting our kitchen waste.

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