SUMMARY AND CONCLUSION

CHAPTER V

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Rapid urbanisation and industrialization are responsible for increase in pollution at all the levels viz., land, air, and water pollution. The factories and mills are depositing their waste into the river and ponds, which is polluting the water. The land is polluted with a lot of solid waste deposited at landfill and on the streets as well. The factories and mills are adding lots of bad gases to the air which contains lots of harmful chemicals, which creates air pollution. One of the land wastes is the household waste. Every year tons of household waste ends up in the landfill. This household waste contains lots of biodegradable waste, which can be segregated at household level and can be utilised to create household compost. The kitchen waste generated at home can be used to create household compost which can be used in the kitchen garden itself. Due to excessive pollution the vegetables and fruits available in the market are full of harmful chemical and pesticides which leads to deadly diseases. Thus, kitchen garden option for fresh vegetables and fruits for the family is adopted by many homemakers now-a-days. The fruits and vegetables grown in one's own kitchen garden can be chemical free and nutritious and can be grown with the use of household compost. In a kitchen garden, one can grow different variety of vegetables and fruits throughout the year. But many a time, problems are experienced by homemakers related to various aspects in kitchen gardening. The problems related to sunlight, soil, drainage, pests, etc. are to be assessed before developing kitchen garden designs. Thus, the researcher assessed the information regarding the problems experienced by the homemakers in their existing kitchen garden. Researcher also gathered data related to the knowledge of the homemakers regarding household compost, with an aim to help solve bio-degradable household kitchen waste problem.

When growing vegetables, every gardener encounters a few common issues at some point. Vegetable farming, unfortunately, may and will cause lots of new issues. It is, nevertheless, important to approach it methodically and gradually. Even before anyone expect any fruit, problems can arise with a newly developing plant. To ensure a successful harvest, one need to diagnose and correct the frequent problems before the plants yield fruit. Some of the common problems related to vegetable and fruit crop are wilting plants, weak and spindly plants, too slow growth of plant with yellow or light

green colour, dark spots on leaves and stems, curling leaves, white spots or coating on the plants, shredded leaves with holes, poor yield with less or no fruits, irregular growth of fruits and vegetables, etc. (1)

The researcher came across many studies related to compost and gardening, but a dearth of research was found focusing on developing kitchen garden designs and methods of the preparation of household compost. This made the researcher interested in this less explored area regarding kitchen garden which was not studied under the umbrella of Family and Community Sciences (Home Science). It is the need of hour to train the homemakers to develop the kitchen garden with best suitable plants according to their available space.

Thus, the major focus of the study was to develop kitchen garden designs for various spaces in the residences. The researcher was also interested in assessing problems experienced by the homemakers regarding their existing kitchen garden and aimed to enhance their knowledge regarding different methods of household composting and its use in their own kitchen garden. The researcher had targeted the respondents who had kitchen garden but were facing problems maintaining their kitchen garden. Researcher also developed a booklet, which covered all the aspects of kitchen gardening. The booklet contained information related to the problems related to kitchen garden and their remedies, methods and techniques of household compost and kitchen garden designs for various spaces of the residence. An intervention program was planned to focus on the problems related to kitchen garden and ways to solve them. The intervention program focused on enhancing the knowledge of the homemaker regarding the benefits of composting, types of composting and preparation and use of composting in their kitchen garden. The intervention program also included various designs of kitchen garden and how these designs can be incorporated in the residences. The program aimed to upgrade the knowledge of the homemakers regarding various aspects of the kitchen garden and motivated them to develop their own kitchen garden in their residence.

The study will be beneficial to the students of Family and Community Resource Management, Interior Designing students, Architecture Students and Landscape Designers to design kitchen garden. The findings of the study will broaden the horizon of kitchen gardening and various kitchen garden designs developed will be useful for

those working in the landscape and gardening area and those who are interested in creating their own garden by themselves.

The study will be beneficial to those who want to have kitchen garden but have less knowledge about the growing patterns and their seasons for cultivation. The study will also be beneficial to those who do not have land space and still want to grow their own vegetables at home. The study will be beneficial to those who want to prepare their own household natural and chemical free compost at home for their kitchen garden. The kitchen garden designs proposed for various spaces would benefit the respondents to plan a kitchen garden and grow fresh and nutritious herbs and vegetables at home.

STATEMENT OF PROBLEM

The present research aimed to develop kitchen garden designs for the residences in Vadodara City.

OBJECTIVES

1. To analyse the extent of problems experienced by the users of their existing kitchen garden.
2. To assess the extent of knowledge of the respondents regarding the household compost.
3. To develop designs for kitchen garden for various spaces as follows:
    a. Small space garden (on land)
    b. Medium space garden (on land)
    c. Large space garden (on land)
    d. Terrace garden
    e. Balcony garden
    f. Container garden
4. To develop a booklet in Gujarati and English language regarding all aspects related to kitchen gardening.
5. To conduct an intervention program and enhance the knowledge of the homemakers regarding the various aspects of kitchen gardening.

METHODOLOGY

For the present study, the descriptive research design was used. The sample of the study comprised of 200 homemakers from various areas of Vadodara City who had kitchen gardens in their residence. The sample for the study was selected through the purposive sampling method and the respondents were contacted through the snowball technique method. The unit of inquiry were the homemakers of the residences having kitchen gardens in their existing residences. The Questionnaire was selected as the tool. The questionnaire was selected keeping in mind the objectives of the present study. The questionnaire was divided into two sections. Section 1 dealt with the demographic profile of the respondents. Section 2 dealt with the extent of problems experienced by the respondents in maintaining their kitchen garden. The respondents were asked to respond to a 3-point continuum in terms of "Always", "Sometimes", "Never" and the scores from 3 through 1 were given to the respondents respectively. To obtain the categories of extent of problem faced, the score range was divided on an equal interval basis. The procedure of analysis of the data comprised of categorization, coding, tabulation, and statistical analysis. An intervention program was conducted for the respondents of the study which focused on enhancing the knowledge of the homemakers regarding various aspects of a kitchen garden. An intervention program was delivered in a regional language (Gujarati) for a better understanding of the audience. The major focus of the intervention program was to discuss the ways to solve the problems faced by the respondents in their existing kitchen garden. The developed designs of the kitchen garden for various spaces of the residence were also explained to the respondents for creating an understanding of the respondents regarding the design aspect of the kitchen garden in various spaces in their residence, namely, land, terrace, balcony, and containers.

MAJOR FINDINGS OF THE STUDY

The major findings of the study are presented here.

Section I: Demographic Profile of the Respondents

While comparing the monthly family income of the respondents it was found that more than one tenth of the respondents had 45,001 ₹ to 60,000 ₹ family monthly income. Mean income of the family was ₹ 66,600. It was found from the gathered data that less

than two-third of the respondents were living in nuclear families. More than one-half of the respondents were having up to 4 members in their families. The data revealed that one-third of the respondents were residing in flats, slightly more than one-third of the respondents were having container type of kitchen garden and majority of the respondents were having 50-200 sq. ft. area of the garden. It was found that more than one-half of the respondents were having rectangle shape of their garden and majority of the respondents were not preparing household compost at their home.

Section II: Extent of problems experienced by the users of their existing kitchen garden

This section of the findings dealt with the extent of problems experienced by the respondents related to their existing kitchen garden. In this section, various problems related to existing kitchen garden, such as, sunlight, water and drainage, soil, food crops and rotation, pollution, seedlings, plants, leaves, bud ends, and fruits were considered.

1. Sunlight: It was found that half of the respondents had insufficient sunlight available in their garden to a high extent.
2. Water and Drainage: Data revealed that more than half of the respondents had problems regarding waterlogging causing breeding of insects, growth of unwanted algae and fungi, and clogging of drainage to a high extent.
3. Soil: It was found that nearly half of the respondents had a high extent of problem regarding walls getting dirty due to soil and need for removal of weeds which resulted in consumption of their time.
4. Food crops and Rotation: Data revealed that nearly half of the respondents had problems related to restrictions in the choice of food crops due to soil and climate conditions, difficulty in placement of food crops due to the size of the garden to a high extent.
5. Pollution: It was found from the data that nearly half of the respondents experienced low extent of problem related to odour in the kitchen garden.
6. Compost: Data revealed that majority of the respondents experienced high extent of problems related to preparing compost.
7. Seedling: More than half of the respondents faced problems related to the germination of seeds, rotten seeds, old seeds, wilted seeds, fungal disease, fertilizer burn, cutworms, and root maggots to a high extent.

8. Plants: More than half of the respondents experienced problems related to death and wilting of plants due to disease, rotting of roots, waterlogging, lack of moisture, slow growth of plants due to insufficient sunlight, cool weather, excess of water, soil nutrient deficiency, compact soil without draining and infected with insects and diseases to a high extent of level.
9. Leaves: The findings of the study revealed that respondents experienced problems related to leaves to a high extent such as yellowing of leaves due to nutrient or mineral deficiency, insufficient sunlight, virus disease, spotted leaves and stems and brown spots due to fertilizer or chemical burns; brown scorched and shrivel leaves due to dry soil, salt damage or fertiliser burn, potassium deficiency, cold temperature; leaves curled or distorted due to wilting, viral disease, moisture imbalance, herbicide injury, weed killer damage; leaves stippled with tiny spots due to spider mites and air pollution (ozone); leaves having holes due to insects or birds and heavy winds.
10. Bud Ends: Nearly half of the respondents experienced problems related to rotted bud ends due to compacted soil; water and nutrient uptake impeded, too – deep cultivation, injured root because of disrupting water uptake to high extent.
11. Fruits: More than half of the respondents faced problems related to no fruits on the plants due to too hot weather, too much nitrogen in the soil, absence of pollination on a plant, not matured plant, and poor soil fertility.

The sample surveyed showed that 55.50 per cent of the respondents experienced high extent of problems in their kitchen garden.

Section III: Extent of knowledge of the respondents regarding the household compost

The knowledge of the respondents regarding the household compost was divided in four different categories, namely, benefits of household composting, types of household composting, materials for household composting and process and preparation of household composting.

1. Benefits of Household Composting: The data revealed that more than slightly three-fourth of the respondents were unaware that composting is an eco-friendly activity and household compost is chemical free option for fertilizer. The data

revealed that 59.50 per cent of the respondents had low extent of knowledge regarding the benefits of household composting

2. Types of Household Composting: The data showed that slightly less than half of the respondents were unaware that vermicomposting is one of the systems to prepare compost at home. Data revealed that 44 per cent of the respondents had low extent of knowledge regarding the types of household composting.
3. Materials for Household Composting: The data revealed 51 per cent of the respondents were unaware that fruit and vegetable peels, coffee grounds, tea bags, nut shells, and crushed eggshells can go in compost. Data uncovered that half of the respondents had moderate extent of knowledge regarding the materials for household composting.
4. Process and Preparation of Household Composting: The data revealed that 46 per cent of the respondents were unaware that compost bins are readily available in the market. Data uncovered that less than half of the respondents had low extent of knowledge regarding the process and preparation of household composting.

The surveyed sample showed that 46 per cent of the respondents were in the low score category having low extent of knowledge regarding the household compost.

Section IV: Design development of Kitchen Garden for various spaces of a residence

The researcher developed designs based on the information gathered through the present study. The designer found that various components of kitchen garden were not set up properly or were in poor condition such as placement of plants, placement of annual medicinal and herb plants, direction of sunlight, clearance space between individual plants and preparation of compost. The proposed designs were prepared using AutoCAD 2021 and SketchUp 2019 software. Kitchen Garden Design of Small Space Land (80-120 sq. ft.), Kitchen Garden Design of Medium Space Land (140-200 sq. ft.), Kitchen Garden Design of Large Space Land (200-600 sq. ft.), Kitchen Garden Design of Residential Terrace (375 sq. ft.), Kitchen Garden Design of Residential Balcony (66 sq. ft.), Kitchen Garden Design of Container (Vertical) and Kitchen Garden Design of Container (Horizontal) were developed.

Section V: Development of Booklet

The booklet contained meaning and importance of kitchen garden, factors to be considered while developing kitchen garden, seasonal chart for growing vegetables at home, home remedies for diseases and pests in the kitchen garden, composting process and its benefits, and kitchen garden designs for various spaces of a residence. It was developed in both English and Gujarati language for better understanding of the users. The significance of topic, content, and language clarity of the text was validated by a panel of experts from the horticulture and landscape design fields. Feedback regarding the design of the booklet, grammar and language for both Gujarati and English were received from the experts which were taken into consideration for the final development of the booklet.

Section VI: Intervention Program for the Respondents

One of the objectives of the present research was to conduct an intervention program for the respondents covering the various aspects of kitchen gardening. The development and implementation of intervention program covered four stages, i.e., preparation of material, contacting the beneficiaries, implementation, feedback of the respondents. The educational material developed for the intervention program was shown through the PowerPoint presentation to the respondents. The PowerPoint presentation containing the various aspects of kitchen gardening was developed in Gujarati language for better understanding of the respondents. The content was reviewed and translated in Gujarati for the presentation. The Gujarati language content was given for validation to the one of the Director of Horticulture, Vadodara district. As per the suggestions given, changes were made in the content. The beneficiaries for the intervention program were selected based on having a kitchen garden in their residences and the one who were willing to develop kitchen garden in their residences. Snowball technique was used to contact the beneficiaries for the intervention program. A suitable time and place were decided for the beneficiaries to attend the intervention program. Two intervention programs were conducted in the Sabha Hall of Swaminarayan Temple, IT Road, Diwalipura, Vadodara and Shantanu Society, Harni Road, Vadodara. The beneficiaries were gathered there, and they were given knowledge of various kitchen garden aspects through PowerPoint presentation. After the presentation the question answer session was done for discussion followed by their feedback. It was observed that many of the respondents who were willing to develop a kitchen garden in their house but could not develop due to minimum space are now having confidence in developing their own

kitchen garden. Also, the respondents who had kitchen garden in their residence were having problems related to the plants, which were solved by discussion in the question-answer session.

CONCLUSION

The study on "Development of Kitchen Garden Designs for the Residences of Vadodara City" was conducted on selected homemakers, who were having kitchen garden in their residences living in Vadodara city. The major objective of the study was to develop kitchen garden designs for the residences of Vadodara city. To attain the major objective, the extent of problems experienced by the users of the kitchen garden and extent of knowledge of the respondents regarding household compost were studied and designs were developed. The major findings of the study revealed that one-third of the respondents were residing in flats, slightly more than one-third of the respondents were having container type of kitchen garden, majority of the respondents were having 50-200 sq.ft. area of garden, more than one-half of the respondents were having rectangle shape of their garden, and majority of the respondents were not preparing household compost at their home. More than half of the respondents (55 per cent) experienced high extent of problems in their kitchen garden. The data revealed that less than half of the respondents (46 per cent) had low extent of knowledge regarding the household compost. It was found that various components of kitchen garden were not set up properly or were in poor condition such as placement of plants, placement of annual medicinal and herb plants, direction of sunlight, clearance space between individual plants and preparation of compost. Therefore, the proposed designs of kitchen garden in various spaces of the residence like; land, terrace, balcony, and container were prepared using AutoCAD 2021 and SketchUp 2019 software. The booklet was developed with the purpose of disseminating detailed information with regards to the development of the kitchen garden. It was developed in both English and Gujarati language for better understanding of the users. One of the objectives of the present research was to conduct an intervention program for the respondents covering the various aspects of kitchen gardening. The purpose of the intervention program was to give more information and motivate the homemakers to develop their kitchen garden and to resolve their queries through one-on-one interaction.

IMPLICATIONS OF THE STUDY

The findings of this study had numerous implications for the field of Interior Design as a specialization in Family and Community Resource Management, Educational Institutions, Government and Non-government Organizations, Architects, Interior Designers, Landscape Designers and Homemakers.

- For Educational Institutions

  The Department of Family and Community Resource Management offers Interior Design specialization at Undergraduate and Post graduate levels where Landscape Designing is an important aspect studied by the students. Thus, the findings of the present study will provide an additional database of information for the courses related to space planning as well as landscape designing. Awareness programmes and skill development workshops can be conducted for the community outreach using the information gathered through the present study. Institutions offering specialized courses in Horticulture, Landscape Designing, Kitchen Designing, Residential Space Designing, Interior Designing and Architecture can use the data of present study for strengthening their curriculum.

- For Government and Non-government Organizations

  Government and Non-government Organizations, working towards promoting consumption of healthy and organic produce can motivate homeowners to adopt kitchen gardening. Present study revealed that homemakers faced many problems with regards to their existing kitchen gardens at home. The problems identified through the present study can be reviewed and necessary help in terms of information and materials, can be provided to the homemakers by Government and Non-government Organizations. The study revealed a lack of knowledge regarding household compost. Government and Non-government Organizations can develop programmes to promote household composting by conducting workshops and awareness programmes.

  Government of Gujarat provides seeds, organic fertilizers and pesticides to any resident who wants to develop a garden, at subsidised rates. Subsidies can be made available, through Government-Industry collaboration to the owners of kitchen garden.

- For Landscape Designers, Interior Designer and Architects

  The findings of the present study provide the landscape designers with data on problems faced by users of kitchen garden. The process of design development of kitchen gardens and designs developed by the researcher, under the present study, are important references for Landscape Designers, Interior Designer and Architects for their related projects.

- For Homemakers

  The respondents for the present study were homemakers. Based on the findings of the study, intervention program was conducted to enhance the knowledge of the homemakers regarding the various aspects of kitchen gardening. A booklet was also developed and distributed among the homemakers, in Gujarati and English language, regarding all aspects related to kitchen gardening which will motivate the homemakers to develop kitchen gardens. The kitchen garden designs provided in the booklet will be helpful to the homemakers to develop their own kitchen garden in various spaces of a residence.

RECOMMENDATIONS FOR THE FUTURE STUDIES

1. A comparative study with similar objectives can be conducted in different States of the country.
2. Effectiveness of Intervention programs related to kitchen gardening can also be studied.
3. Development of designs for kitchen garden in the hostels, hotels and guest houses can be undertaken as a study.
4. Problems experienced related to kitchen garden in different cities can also be studied.
5. Experimental study of effectiveness of household compost in existing kitchen garden can be studied.