APPENDICES

APPENDIX 1

QUESTIONNAIRE

Section – I Demographic Profile of the Respondent

1. Full Name: _____
2. Address: _____
3. Phone No.: (R.) _____ (M.) _____
4. Monthly Family Income ₹: _____
5. Type of Family: ☐ Joint
   ☐ Nuclear
6. No. of Family Members: _____
7. Type of House: ☐ Row House
   ☐ Duplex
   ☐ Bungalow
   ☐ Tenement
   ☐ Flat
8. Type of Kitchen Garden: ☐ Land
   ☐ Balcony
   ☐ Terrace
   ☐ Container
9. Area of the garden: _____
10. Shape of the garden: _____
11. Preparation of household compost at home: ☐ Yes
    ☐ No

SECTION – II EXTENT OF PROBLEM

Following are the statements for the extent of problems experienced by the respondents in maintaining the kitchen garden. Put a Tick (✓) against "Always", "Sometimes" or "Never" as per extent of problem you face regarding kitchen garden.

Sr. No.	Statements	Always	Sometimes	Never
	SUNLIGHT			
1.	There is insufficient sunlight available in the garden.			
2.	Excess of heat causes plants to get dry.			
3.	There is harsh sunlight entering in the garden.			
	WATER AND DRAINAGE			
4.	Waterlogging causes breeding of insects in the garden.			
5.	Water-logging leads to growth of unwanted algae and fungi.			
6.	Waterlogging causes death of certain plants due to air-blockage.			
7.	Waterlogging affects the growth of the food crops as roots get damaged due to access water.			
8.	Running water causes soil erosion in the garden.			
9.	Problem is faced in watering the kitchen garden.			
10.	Drainage system gets clogged easily.			
	SOIL			
11.	Walls of the building get dirty because of soil of the garden.			
12.	There is need for regular removal of weed which is time consuming.			

13.	There is infestation of harmful pests in the garden.			
	FOOD CROPS AND ROTATION			
14.	There is restriction in choice of food crops due to soil and climate conditions.			
15.	There is difficulty in placement of food crops due to size of the garden.			
16.	There is difficulty in placement of food crops due to shape of the garden.			
17.	There is a limited flexibility in plant rotation (changing the type of plant) due to soil.			
18.	There is a limited flexibility in plant rotation (changing the type of plant) due to climate condition.			
19.	There is a limited flexibility in plant rotation (changing the type of plant) due to space.			
20.	There is a limited flexibility in plant rotation (changing the type of plant) due to excess of heat.			
21.	The food crops are not fully grown in containers.			
22.	The yield of the food crops is not enough for the family.			
23.	The quality of fruits and vegetables grown in containers is lower than that grown in land.			
24.	Problem is faced in maintaining the quality of soil which in-turn affects the growth and life of the food crops.			
25.	Problem is faced in protecting the food crops from the untamed animals; like, monkeys, birds, etc.			
	POLLUTION			
26.	There is an odour in the kitchen garden which makes it impossible for the people to sit and use it.			

27.	Problem is faced in maintaining cleanliness in the kitchen garden.			
28.	There is difficulty in maintaining the food crops due to pollution.			
	SEEDLINGS			
29.	Seedlings do not emerge after sowing as not enough time has passed for germination.			
30.	Seedlings do not emerge after sowing as temperatures is too cold.			
31.	Seedlings do not emerge after sowing as soil is too dry.			
32.	Seedlings do not emerge after sowing as soil is too wet; seeds rotted.			
33.	Seedlings do not emerge after sowing as birds or insects ate seeds			
34.	Seedlings do not emerge after sowing as seed was too old, no longer viable.			
35.	Seedlings wilt and fall over and young plants die soon due to dry soil.			
36.	Seedlings wilt and fall over and young plants die soon due to damping off (fungal disease).			
37.	Seedlings wilt and fall over and young plants die soon due to rotting roots or stems.			
38.	Seedlings wilt and fall over and young plants die soon due to fertilizer burn.			
39.	Seedlings wilt and fall over and young plants die soon due to cutworms.			
40.	Seedlings wilt and fall over and young plants die soon due to root maggots.			
41.	Seedlings wilt and fall over and young plants die soon due to old seed.			
	PLANTS			
42.	Young plants wilt due to lack of moisture in soil.			

43.	Young plants wilt due to too much water; poor drainage or waterlogged soil.			
44.	Young plants wilt due to disease.			
45.	Young plants wilt due to root rot (fungal disease).			
46.	Young plants wilt due to Vascular wilt (fungal disease often affecting tomato, potato, eggplant, pepper).			
47.	Plants are weak and spindly due to not getting enough light; too much shade.			
48.	Plants are weak and spindly due to too much water.			
49.	Plants are weak and spindly due to plants are crowded, spaced too close to each other.			
50.	Plants are weak and spindly due to too much nitrogen.			
51.	Plants grow slowly; leaves are light green due to insufficient light in the garden, or the garden is shaded.			
52.	Plants grow slowly; leaves are light green due to the cool weather and the temperature too low.			
53.	Plants grow slowly; leaves are light green due to too much water.			
54.	Plant growth is stunted, and leaves are pale yellow and sickly looking due to soil nutrient deficiency.			
55.	Plant growth is stunted, and leaves are pale yellow and sickly looking due to Compacted soil and not draining.			
56.	Plant growth is stunted, and leaves are pale yellow and sickly looking due to acid soil; pH is low.			
57.	Plant growth is stunted, and leaves are pale yellow and sickly looking due to Insects or diseases.			
58.	Plant growth is stunted, and leaves are pale yellow and sickly looking due to Yellow or wilt disease, especially if yellowing attacks one side of the plant first.			

	LEAVES			
59.	Leaves yellow but do not wilt as there is nutrient or mineral deficiency.			
60.	Leaves yellow but do not wilt as there is insufficient light; too much shade.			
61.	Leaves mottle yellow and green, mosaic pattern and Leave pucker leaves; stunted plants due to virus disease.			
62.	Leaves and stems are spotted; darkened spots on stems and leaves and seedlings turn brown and die due to fertilizer or chemical burn; fertilizer placed directly on plant tissue or too much fertilizer added to soil.			
63.	Brown spots on leaves due to fertilizer or chemical burn.			
64.	Brown spots on leaves due to fertilizer placed directly on plant and chemical placed on plant or drifted on wind to plant.			
65.	Leaf margins look scorched, turn brown and shrivel due to dry soil.			
66.	Leaf margins look scorched, turn brown and shrivel due to salt damage.			
67.	Leaf margins look scorched, turn brown and shrivel due to fertilizer burn.			
68.	Leaf margins look scorched, turn brown and shrivel due to potassium deficiency.			
69.	Leaf margins look scorched, turn brown and shrivel due to cold injury and low temperatures.			
70.	Leaves curled, puckered, or distorted due to wilting.			
71.	Leaves curled, puckered, or distorted due to viral disease.			
72.	Leaves curled, puckered, or distorted due to moisture imbalance.			
73.	Leaves curled, puckered, or distorted due to herbicide injury.			

74.	Young leaves curl down, edges roll and Leaf surface become distorted and veins turn light color due to weed killer damage.			
75.	Leaves stippled with tiny white spots due to spider mites.			
76.	Leaves stippled with tiny white spots due to air pollution (ozone).			
77.	Powdery white coating on upper surface of leaves, stems, and flowers due to powdery mildew (fungal disease) which occurs when leaves are dry but weather is humid.			
78.	Leaves have holes; seedling and fruits chewed due to insects, slugs, birds, rodents, rabbits.			
79.	Leaves have holes; seedling and fruits chewed due to heavy winds or hail.			
80.	Leaves shredded or stripped from plant due to rodents, slugs, and hail damage.			
	BUD ENDS			
81.	Bud ends of tomatoes and peppers rot due to Dry weather following a wet spell.			
82.	Bud ends of tomatoes and peppers rot due to uneven irrigation.			
83.	Bud ends of tomatoes and peppers rot due to insufficient calcium in the soil.			
84.	Bud ends of tomatoes and peppers rot due to compacted soil; water and nutrient uptake impeded.			
85.	Bud ends of tomatoes and peppers rot due to too-deep cultivation.			
86.	Bud ends of tomatoes and peppers rot due to root injured disrupting water uptake.			
	FRUITS			
87.	There is no fruit on plant due to weather too cold.			
88.	There is no fruit on plant due to weather too hot.			

89.	There is no fruit on plant due to too much nitrogen.			
90.	There is no fruit on plant as there is no pollination.			
91.	There is no fruit on plant as plants are not mature enough.			
92.	Poor fruit yield; small fruit; poor favor due to uneven soil moisture.			
93.	Poor fruit yield; small fruit; poor favor due to poor soil fertility.			
94.	Poor fruit yield; small fruit; poor favor due to improper temperature.			

SECTION III – EXTENT OF KNOWLEDGE

Following are the statements for the extent of knowledge of the respondents about the household compost. Put a Tick (✓) against "Aware", "Undecided" or "Unaware" as per your knowledge regarding household compost.

Sr. No.	Statements	Aware	Undecided	Unaware
	Benefits of Household Composting			
1.	Household compost can be prepared at home.			
2.	Composting is an Eco-Friendly activity.			
3.	Household compost can be prepared from kitchen waste.			
4.	Household compost can be prepared from garden waste.			
5.	Household compost is chemical free option for fertilizer.			
6.	Compost bins are available in the market.			
7.	Making compost at home doesn't require much space in the house or garden.			
8.	Household compost improves the texture of the garden soil to make hold of air and water.			
9.	Household compost adds nutrients to the soil to promote the healthy root development in garden plants.			
10.	Household compost can keep your vegetables and fruit plants chemical free.			
11.	Household compost helps to reduce the house waste dumping into the landfills.			
12.	In Compost pile, decaying waste produces far less methane compare to decaying in landfill.			
13.	By using household compost, can reduce polluting water supply by chemicals.			
14.	Brown materials are dry and rich in carbon.			
15.	Office paper, newspaper, cardboard and toilet paper rolls can be used in composting.			
16.	Glossy paper or paper with coloured ink cannot be compost.			
17.	Dry leaves, pine needles, straw and small twigs can be added to the compost bin.			
18.	Hay, which contains seeds, cannot be added into the compost bin.			
19.	Small branches take long time to break in the compost bin.			
20.	Wood chips, clean sawdust and ashes from clean materials can go into compost.			

21.	Green materials are moist and add nitrogen to the finished compost.			
22.	Fruit and vegetable peels, coffee grounds, tea bags (with staple removed), nut shells, and crushed eggshells can go in compost.			
23.	Meat, bones and fish scraps should not be added to compost pile as they attract pests to it.			
24.	Dairy products and greasy or oily foods should not go into compost.			
25.	Peels from oranges, peaches, or bananas which are organic can go to compost pile.			
26.	Green leaves, stems, flowers, and grass clippings with herbicides can be compost.			
27.	Weeds without seed can go in compost bin.			
28.	Animal droppings can be great Compost Activator making the waste decay faster.			
29.	The ratio for mixing Brown material with Green Material is 2:1 or 3:1 (Carbon: Nitrogen).			
30.	Readymade compost bins are available in the market.			
31.	The compost pile should be turn regularly with a pitchfork to add air and every time you add anything to pile.			
32.	Open pile & enclosed bins and cold composting & hot composting are the methods of preparing compost at home.			
33.	Cold composting takes one growing season to prepare.			
34.	Hot composting takes six to eight weeks to prepare.			
35.	Vermicomposting is one of the systems to prepare compost at home.			
36.	In vermicomposting, in enclosed bin the vegetable waste is filled with worms called red wigglers.			
37.	Vermicompost means the warm casting prepared by the waste digestion of the warms.			
38.	Vermicompost is rich brown material which is excellent fertilizer for plants.			
39.	Worm compost bins takes three to six months to produce finished compost.			
40.	DIY options for compost bins are available.			
41.	Plastic bucket or containers can be used as compost bins.			
42.	Box built of scrape wood can also be used as compost bin.			

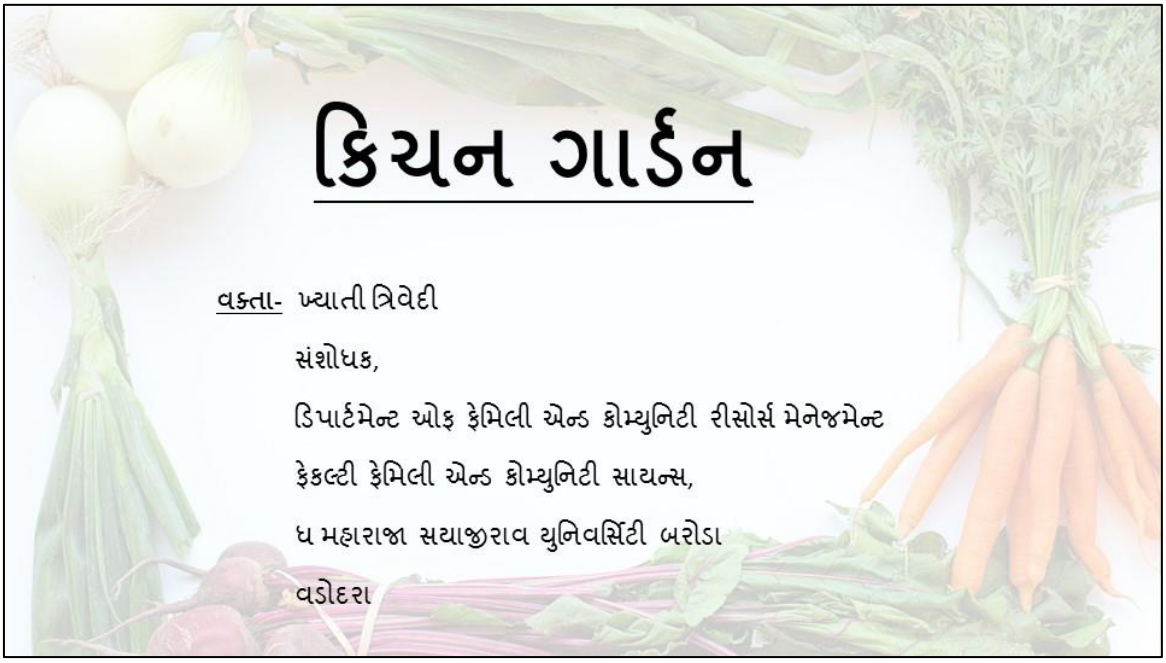
43.	Cylindrical garbage bin can be used as enclosed compost bin.			
44.	In enclosed bin, the bin needs to have holes around the sides for aeration.			
45.	In open bins, the fruits and vegetable scrapes can attract small flying insects and fruit flies.			
46.	If the compost bin smells like ammonia, then the pile contains too much green materials.			
47.	A smell like rotten eggs is usually due to too much moisture or too little air.			
48.	Wet materials, such as leaves, can stick together in a compost bin and form mats that keep the pile from breaking down evenly.			
49.	If the pile is taking too long to prepare compost, then the pile is too small or too compressed or too dry.			
50.	If pile is taking too long to prepare compost, then it might be lacking in nitrogen.			
51.	Too much water in your pile can reduce the level of oxygen and invite oxygen-deficient bacterial and a foul odor.			
52.	Composting can reduce the overall waste production and is a highly effective means of recycling valuable nutrients in organic matter,			
53.	The visible benefit of composting is the diversion of organic materials from the waste stream.			
54.	By diverting organic wastes from landfills, the lifespan of municipal landfills can be lengthened, reducing the need to continually create new landfills.			
55.	Composting has implications for improving air quality when treated as an alternative to waste incineration.			
56.	The waste incinerators produce more CO2 emissions than oil, coal or natural gas-fueled power plants.			
57.	Emissions are reduced by reducing the need for commercial production & transit of fertilizers, pesticides & herbicides.			
58.	Emissions are reduced by reducing the need for trash & green waste hauling & processing by commercial facilities.			
59.	Emissions are reduced by reducing the need for personal transportation to purchase commercial fertilizer, pesticide & herbicides.			

60.	Composting can remove or break down hazardous materials in soil and turn them into harmless substances.			
61.	By composting, one can decrease the dependence on fertilizers and pesticides that impact the ecosystem.			
62.	Compost bins should be within the reach of water source.			
63.	Compost bins should be in a convenient area near garden or house.			
64.	Composting bins should be protected from direct winds.			
65.	Composting bins should be in a spot with good drainage.			
66.	Composting bins should be three feet away from buildings.			

APPENDIX 2

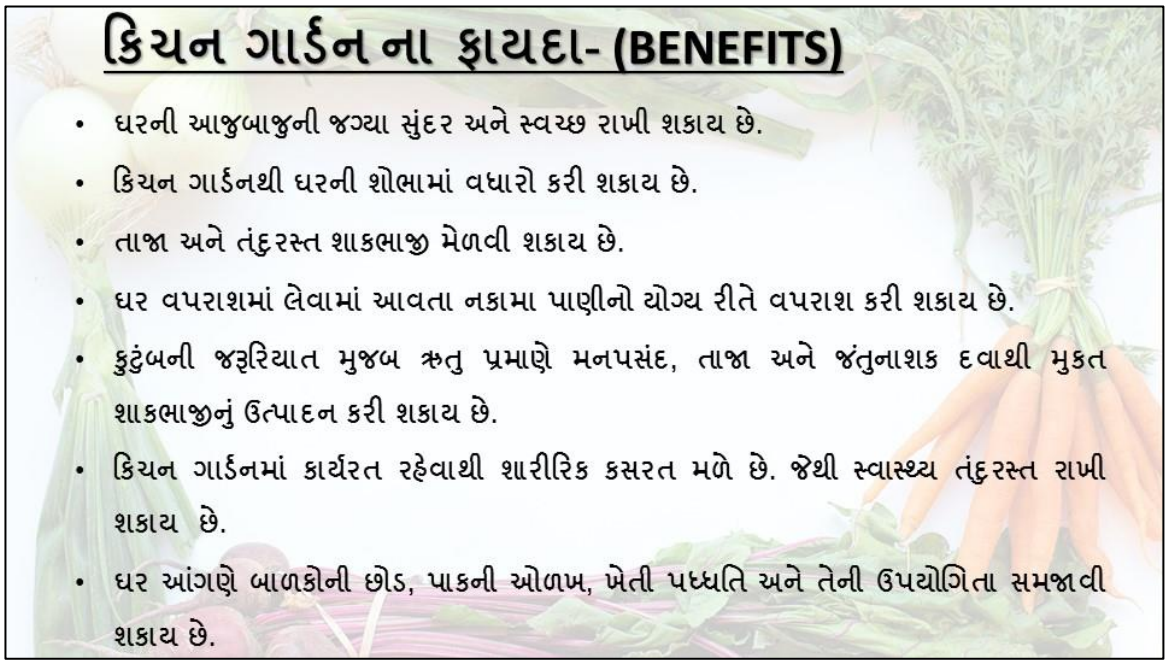
Educational Material for Intervention Programme

(PowerPoint Presentation)

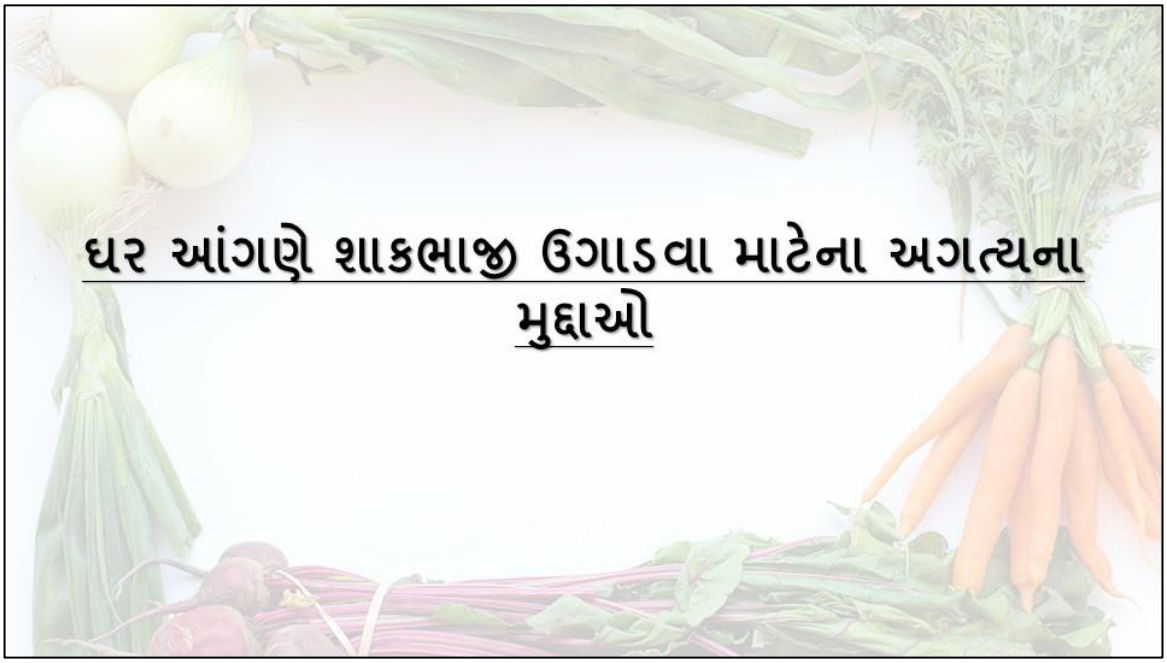


SLIDE 1

SLIDE 2



SLIDE 3



SLIDE 4

SLIDE 5

SLIDE 6

SLIDE 7

SLIDE 8

ટપક સિંચાઈ સિસ્ટમના ફાયદા

- પાણીની બચત
- પાણીની કટોકટી વ્યવસ્થાપન
- પાણી સીધું મૂળ સુધી પહોંચે છે
- બાષ્પીભવનનો દર નહીં
- ઓનલાઈન ખરીદીથી ટપક સિંચાઈ પદ્ધતિની કિંમત ૩.500 થી ૩.1500 છે.
- ઘરે સ્થાપિત કરવા માટે સરળ

SLIDE 9

કિચન ગાર્ડન માટે રસોડામાંથી નીકળતું વધારાનું પાણી શાકભાજી માટે વપરાય છે. પરંતુ બાથરૂમમાં સ્નાન કે કપડા ધોતા બહાર આવતું પાણી કિચન ગાર્ડન માટે વાપરવું હિતાવહ નથી.

1. https://www.google.co.in/imgres?imgurl=https%3A%2F%2Fcompa.gograph.com%2Fhappy-cartoon-baby-kid-in-bath-tub_gg67026149.jpg&imgrefurl=https%3A%2F%2Fwww.gograph.com%2Fillustration%2Fhappy-cartoon-baby-kid-in-bath-tub-gg67026149.html&tbnid=soPg2x2hdrl4SM&vet=12ahUKEwjt6_Tpn5X1AhVGxzACHQR3AHMQMygtegUIARDDAg..i&docid=sn2RKB-R42-hXBM&w=450&h=470&itg=1&q=BATHING%20CLIPART&hl=en&authuser=2&ved=2ahUKEwjt6_Tpn5X1AhVGxzACHQR3AHMQMygtegUIARDDAg

2. https://www.amazon.com/dp/B0BHGVXZY3

SLIDE 10

રસોડા કે ઘરમાંથી નીકળતા વધારાના પાણીને સીધા જ ક્યારામાં ન વહેવડાવતાં કુંડી કે ટાંકીમાં એકઠુ કરી જરૂર પડે ત્યારેજ તેનો ઉપયોગ થાય તેવી વ્યવસ્થા કરવી. કેમ કે છોડને ભેજની જરૂર છે, પાણીની નહી.

https://www.landscaping-capetown.co.za/services/greywater-systems/

SLIDE 11

રોપણી
(PLANTING)

https://www.vhv.rs/viewpic/TRxhhib_transparent-seeds-clipart-plant-seeds-clipart-hd-png/

SLIDE 12

SLIDE 13

ક્રમ	ઋતુ	મહિનો
૧	ચોમાસુ	જુન, જુલાઈ
૨	શિયાળુ	ઓક્ટોબર, નવેમ્બર
૩	ઉનાળો	ફેબ્રુઆરી, માર્ચ

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ઘર આંગણે ઋતુ પ્રમાણે શાકભાજી પાકો નું આયોજન

ઋતુ	વાવેતર સમય	શાકભાજી પાકો
ચોમાસુ	જૂન – જુલાઈ	રીંગણ, મરચી, ટામેટા, ભીંડા, દૂધી, તુરીયા, કાકડી વગેરે
શિયાળુ	ઓક્ટોબર	લસણ, ડુંગરી, મૂળા, ગાજર, વટાણા, ધાણા, મેથી, વગેરે
ઉનાળો	ફેબ્રુઆરી – માર્ચ	ચોળી, ભીંડા, ગુવાર, રીંગણ, દૂધી, તરબૂચ, કારેલા, ગીલોડા, શક્કરટેટી, વગેરે
બહુવર્ષાયુ	-	સરગવો, મીઠો લીમડો

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SLIDE 22

વેલાવાળા શાકભાજીના પાકોના વેલા ઝાડ, અગાશી પર ચઢાવી શકાય અથવા મંડપ બનાવી રોપણી કરવી.

https://www.google.co.in/imgres?imgurl=http%3A%2F%2Fwww.ugaoo.com%2Fknowledge-center%2Fwp-content%2Fuploads%2F2017%2F02%2Fshutterstock_486559075.jpg&imgrefurl=https%3A%2F%2Fwww.ugaoo.com%2Fknowledge-center%2Fvegetables-that-require-trellis-support%2F&tbnid=zrBFPhd-Phyj7M&vet=12ahUKEwit0Z65k5v1AhU5y3MBHal3CngQMygJegUIARDCAQ..i&docid=cHvD1FHwuZBazM&w=1000&h=667&itg=1&q=creeper%20vegetable%20plants%20on%20trellis%20pictures&hl=en-GB&ved=2ahUKEwit0Z65k5v1AhU5y3MBHal3CngQMygJegUIARDCAQ

SLIDE 23

- કિચન ગાર્ડનમાં સરગવો અને મીઠો લીમડાના છોડની રોપણી કરી શકાય.
- કુટુંબના સભ્યોની જરૂરિયાત મુજબ શાકભાજી પાકનો વાવેતર વિસ્તાર રાખવો.

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SLIDE 26

કિચન ગાર્ડન ના રોગ અને જીવાત માટે ઘરગથ્થુ ઉપચાર

- ડુંગળી- ડુંગળી તીવ્ર વાસ ધરાવે છે. ડુંગળી ના નાના ટુકડા કરીને મિક્ષરમાં ક્રશ કરી પેસ્ટ બનાવવી. આ તૈયાર કરેલ પેસ્ટ ને પાણીમાં નાખી આ પાણીને છોડ પર સ્પ્રે કરવાથી કીડી-મકોડા જીવાતોથી છુટકારો મળે છે.
- લસણ- લસણ પણ અતી તીવ્ર વાસ ધરાવે છે. ૧ લિટર પાણીમાં લસણની બે પેશીઓને ૨૦ થી ૨૫ મિનિટ ડુબાડી રાખી તેને પાણીમાંથી બહાર કાઢી આ મિશ્રણ અઠવાડિયામાં બે વાર છોડ ઉપર છાંટવાથી કીડી-મકોડા તથા જીવાતોથી રક્ષણ મળશે.
- લાલ મરચું- ૧ લિટર પાણીમાં ૧ ચમચી લિક્વીડ ડીસસોપમાં ૧ ચમચી મરચાનો પાવડર મીક્ષ કરી તેને પાંદડા અને છોડ ઉપર સ્પ્રે કરવાથી રક્ષણ મળશે.

SLIDE 27

બોરેક્સ તથા ખાંડ- બોરેક્સ પાવડર અને ખાંડ સરખા પ્રમાણમાં લઇને ભેળવી દો. કીડીઓ ખાંડની સાથે સાથે બોરેક્સ પાવડર પણ ખાઇ જતી હોય છે. જે તેના માટે હાનીકારક છે. જેથી કીડીઓથી છુટકારો મેળવી શકાય છે. સાઇટ્રીક એસીડ અને ગરમ પાણી નાખવાથી કીડીઓથી છુટકારો મળશે.

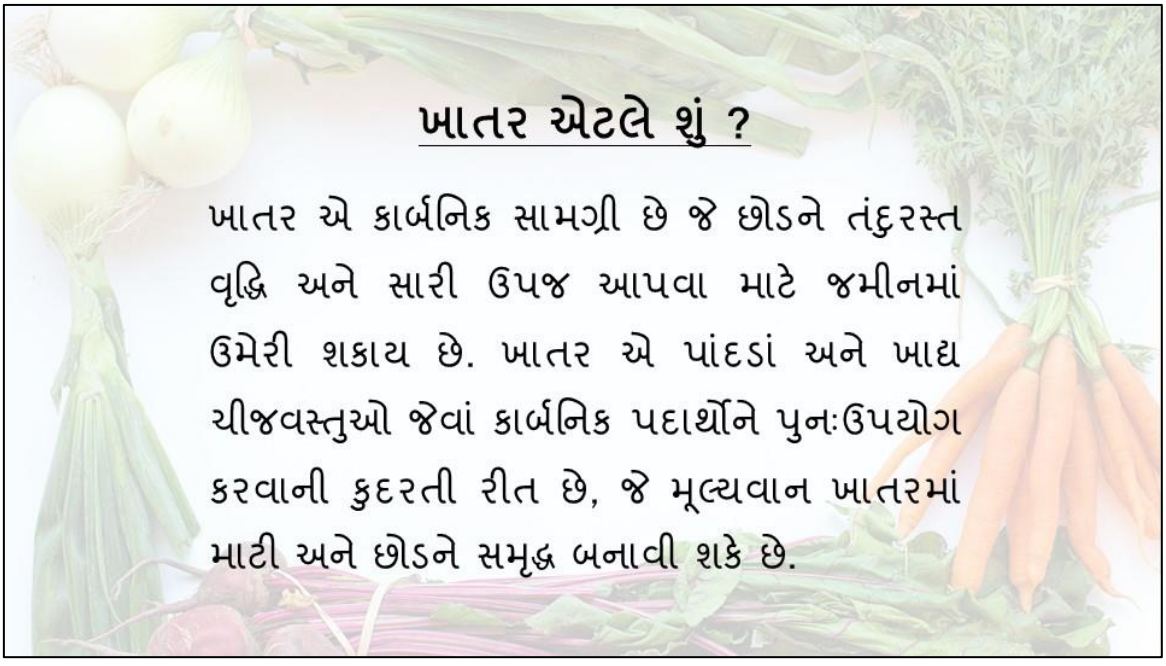
મીઠું- ૪ લિટર પાણીમાં ૨ ચમચી મીઠું ઓગાળીને સ્પ્રે કરવાથી જીવાતો મરી જશે.

બેકીંગ સોડા- ૧ લિટર પાણીમાં ૧ નાની ચમચી બેકીંગ સોડા ભેળવી લો. તેમાં ૧ ચમચી સાબુનો ભુકો પણ ઉમેરી દો, મિક્ષ કરી સ્પ્રે કરવાથી જીવાતો મરી જશે.

ડિશ સોપ- ૪ લિટર પાણીમાં ૨૫ મી.લિટર લિક્વીડ ડીસસોપ કે ૫૦ ગ્રામ ડિશ સોપ મિક્ષ કરી સ્પ્રે કરવાથી કીડી-મકોડા અને ઇયળોથી છુટકારો મળશે.

SLIDE 28

SLIDE 29



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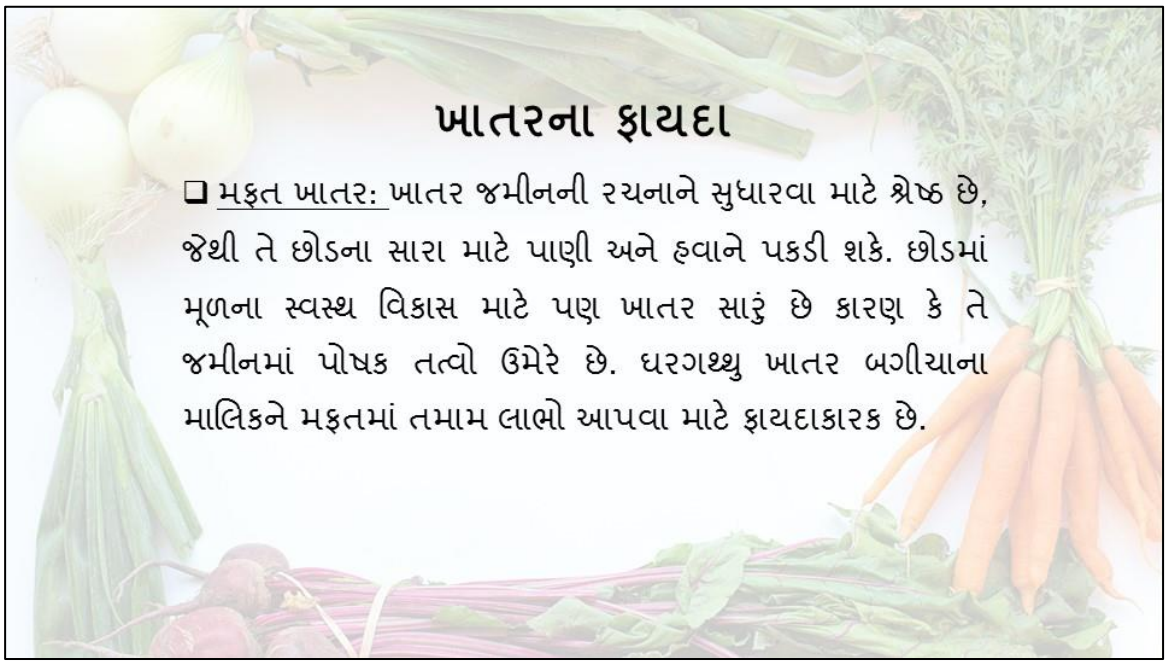

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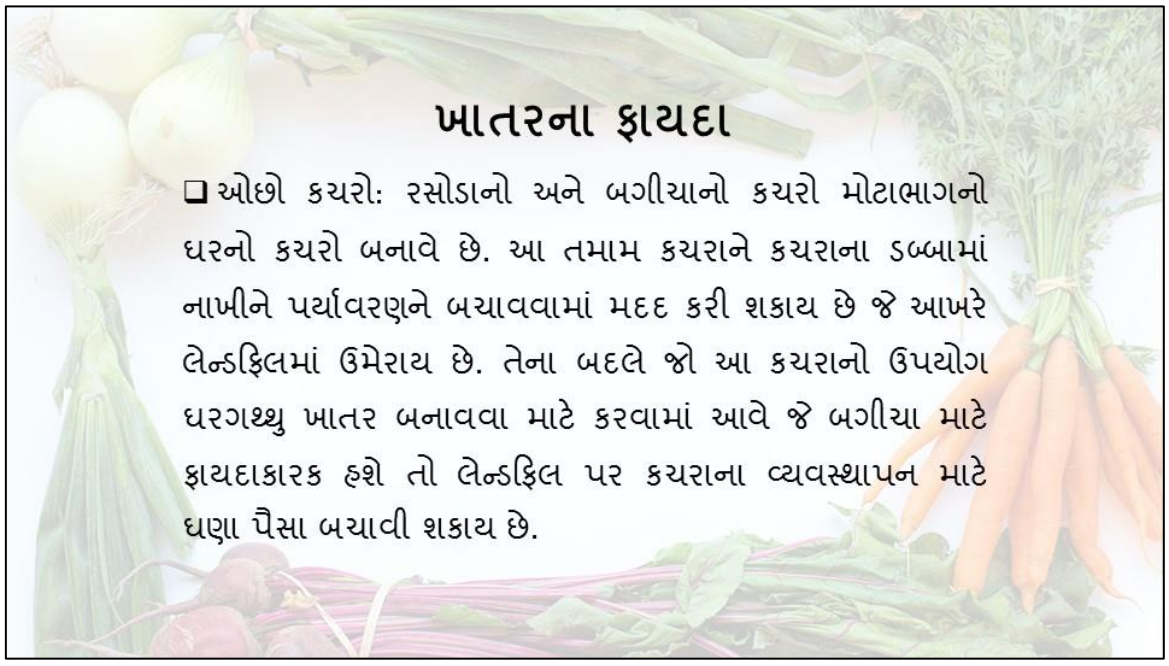

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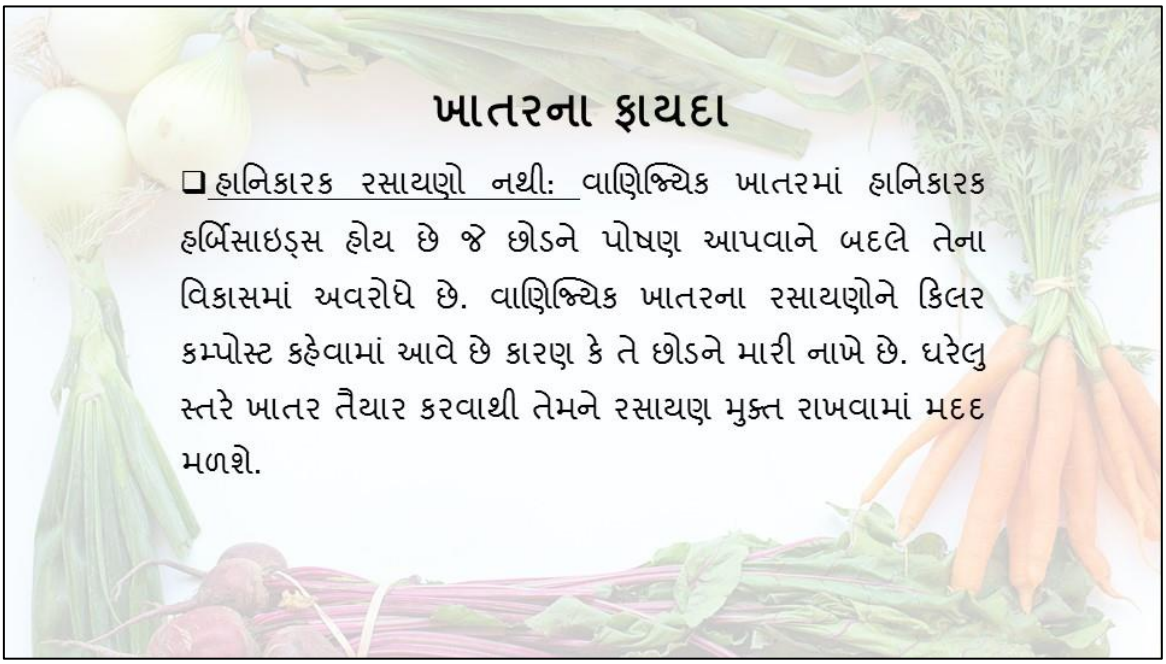

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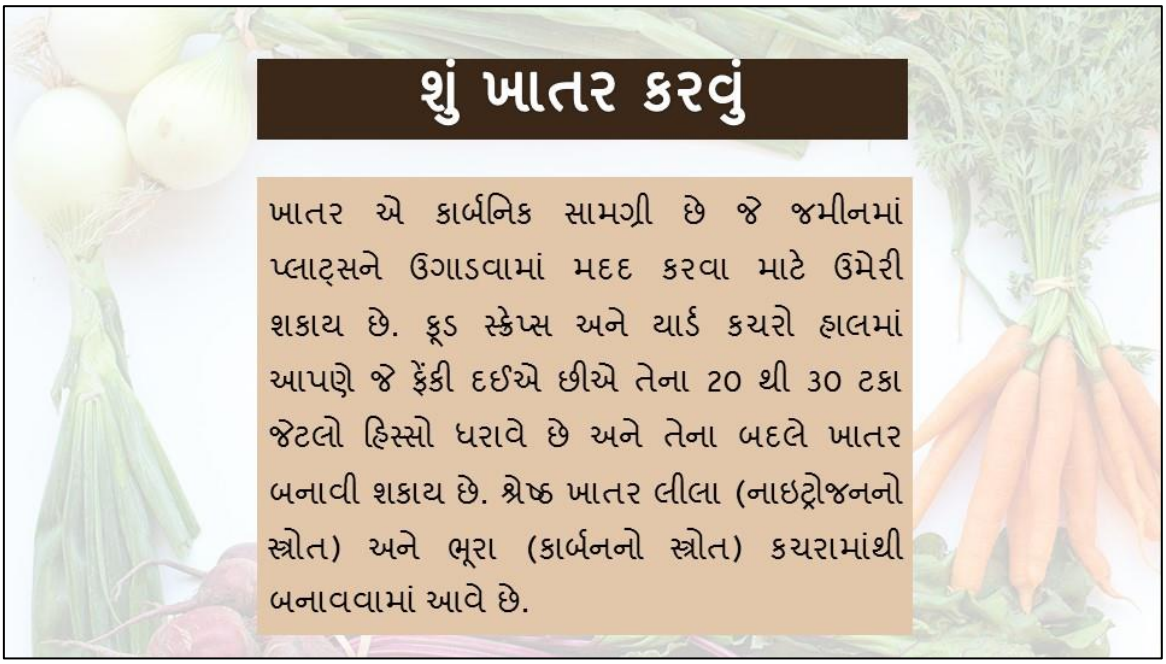


SLIDE 34

SLIDE 35

SLIDE 36

APPENDIX 3

PAPER PUBLICATION CERTIFICATE

Print

THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA

PUBLICATION CERTIFICATE

Name of Ph.D. Supervisor Dr.Sarjoo Himanshu Patel

Published Articles/Papers in Journals

Sr No.	Author(s)	Paper Title	Journal Name & ISSN & Volume No.	Published Year	DOI	Index in Scopus/UGC CARE/Clarivate	Document Submitted?
1	Trivedi, K. and Patel, S.	EXTENT OF PROBLEMS EXPERIENCED BY HOMEMAKERS REGARDING THEIR OWN KITCHEN GARDENS IN VADODARA CITY	Journal Name: The Indian Journal of HOME SCIENCE, ISSN: 0970 2733, Volume No.: 34	1-7-2022		In Scopus: No, In UGC CARE: Yes, In Clarivate: No	Submitted
2	Patel, S and Smita	Role of Hospitality Sector in Enhancing Guest Experience during COVID-19 Pandemic	Journal Name: International Journal of Transformation in Tourism and Hospitality Management and Cultural Heritage, ISSN: 2581 4869, Volume No.: 5	1-8-2021		In Scopus: No, In UGC CARE: No, In Clarivate: No	Submitted
3	Agarwal, R. and Patel, S.	Domestic Tourism in Gujarat- A SWOT Analysis	Journal Name: Kala Sarovar, , Volume No.: 24	1-5-2021		In Scopus: No, In UGC CARE: Yes, In Clarivate: No	Submitted

APPENDIX 4

The Indian Journal of Home Science 2022: 34(2)

EXTENT OF PROBLEMS EXPERIENCED BY HOMEMAKERS REGARDING THEIR OWN KITCHEN GARDENS IN VADODARA CITY

Ms. Khyati Trivedi [1] and Dr. Sarjoo Patel [2]
[1] Ph.D. Research Scholar and [2] Assistant Professor (Stage III),
HSAI Membership No. 12/GJ/P-2/LF
Department of Family and Community Resource Management,
Faculty of Family and Community Sciences,
The Maharaja Sayajirao University of Baroda, Vadodara
Email ID: khyatidoshi23@hotmail.com ; sarjoo.patel-fcrm@msubaroda.ac.in,

ABSTRACT

The waste is affecting all the natural resources by polluting air, water and land. Waste generation is done at all the level, viz; household, commercial, industrial, etc. The major waste generation at the household level is bio-degradable waste which can be minimised by preparing the homemade compost for using in kitchen garden for growing fresh and chemical-free vegetables and fruits. Homemakers are incorporating kitchen gardens in their homes for growing fresh and nutritious chemical-free food crops. In doing so homemakers may face problems in developing, utilizing and maintaining their kitchen gardens. One needs to identify the problems faced in the development or maintaining the kitchen garden. So the researcher was interested to study the problems faced by the homemakers in their kitchen garden. Research design for the present study, was descriptive. The sample comprised of 200 homemakers from various areas of Vadodara City who had kitchen gardens in their residence. The Questionnaire was selected as the tool. 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 procedure of analysis of the data comprised of categorization, coding, tabulation, and statistical analysis. The extent of the problems faced by the homemaker was found to be at a high extent. An intervention program was conducted for the respondents focusing on the ways to solve the problems related to sunlight, space, soil, seedlings, pests, etc. through PowerPoint presentation. The intervention program also included various designs of kitchen garden and how these designs can be incorporated into the residences. The intervention program aimed to upgrade the knowledge of the homemakers regarding various aspects of the kitchen garden and motivated them to develop their kitchen garden in their residence.

Keywords: Kitchen Gardens, Problems, Homemakers, Intervention Program

INTRODUCTION

India faces a truly formidable challenge in managing the rapid process of urbanization and the growth of its cities (Ballaney, 2008). Due to the rapid rise in migration from rural areas to cities, there is increasing pressure on land as a resource. As the population increases, more land is required for providing basic human needs like food and shelter. Everything is changing at a faster rate than one can predict. Previously, when the population was small, needs were few, and resources were plentiful, garbage was primarily biodegradable and spontaneously recycled. However, as the world's population grew, urbanisation and industrialization grew, the consequent

massive amount of garbage, of all types, grew beyond nature's capabilities, posing a serious dilemma. As a result, rising waste levels are concerning. This necessitates efforts such as reducing waste generation to lessen the negative consequences and challenges associated with solid waste disposal and disposing of waste in a way that allows for resource recovery through recycling (Patel, 1999).

Major waste generation at the household level is bio-degradable waste, which can be minimised by taking proper measures. One such measure is preparing homemade compost prepared from the bio-degradable waste generated in the kitchen or garden. Homemade compost is a great substitute for the chemical fertilisers available in the market. Homemade compost can be a good option for growing healthy and nutritious organic vegetables and fruits in one's kitchen garden. In the kitchen garden, one can grow organic vegetables for family consumption by using homemade compost prepared from kitchen waste at home. People have started developing kitchen gardens in their houses in places such as terraces, balconies, window sill, or containers even if the land space is not available. The kitchen garden provides fresh, healthy, and nutritious vegetables for the family.

The importance of gardens has greatly increased in present times,as, it presents many advantages. It improves human health and adds to the natural environment. It helps in improving quality of life by providing opportunities for refreshment, relaxation, and recreation. Some gardens are developed for aesthetic purposes, while some gardens also produce food crops, sometimes in separate areas, or sometimes intermixed with both. In a home, a garden developed to provide food crops and other consumable flora is known as a kitchen garden. The vegetables and fruits are the basic necessity of daily routine and the hike in the price of the vegetables and fruits affect the purchase of the same. Fixed-income group families have to suffer from decreasing real incomes and purchasing power. The need of an hour is to gain access to increasing the nutritious value of the food at present. Now a day's people have started incorporating kitchen gardens in modern houses for growing fresh and nutritious chemical-free food crops (Rehman, et.al., 2013). Kitchen gardens can be grown in the space available at the backyard of the house or a group of women can come together, identify a common place or land and grow desired vegetables, fruits, cereals, etc. that can benefit the women and community as a whole (Christensen, 2011).

In present times, people are more sensitized regarding the benefits of a kitchen garden, and therefore, several homemakers develop it in their homes. It is designed professionally by landscape experts or self-developed by homemakers. Homemakers plan kitchen gardens for growing fresh and nutritious fruits and vegetables. In doing so homemakers may face problems in developing, utilizing and maintaining their kitchen gardens. Kitchen gardening may seem easy but many problems are encountered by homemakers in this. People who already have developed kitchen gardens also face different problems related to their kitchen garden; viz, related to soil, drainage, amount of sunlight, pests, seedlings, plants, fruits, etc. All these problems also need to be addressed while developing a kitchen garden. One needs to identify the issues faced in the development or maintaining the kitchen garden. Thus, it is necessary to study the problems faced by the homemakers in their kitchen garden.

The researcher came across studies related to the assessment of home and kitchen gardens in relation to nutrition, cost-benefits, social attitude, maintenance of plants, and bio-diversity in home gardens, but a dearth of research was found focusing on problems experienced by

homemakers regarding their kitchen garden. Therefore, the present study was undertaken with the objective to find the extent of problems experienced by the homemakers regarding their kitchen garden. An intervention program focusing on the problems related to kitchen garden and ways to solve them was planned. The intervention program also included various designs of kitchen garden and how these designs can be incorporated into the residences. The intervention program aimed to upgrade the knowledge of the homemakers regarding various aspects of the kitchen garden and motivated them to develop their kitchen garden in their residence.

OBJECTIVE OF THE STUDY:

1. To find the extent of problems experienced by the homemakers regarding their own kitchen garden.
2. To conduct an intervention program to provide solutions to the problems experienced by the homemakers in their existing kitchen garden.

METHODOLOGY

For the present study, the descriptive research design was used. The sample 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 was the homemakers of the residences having kitchen gardens in their existing residences. The Questionnaire was selected as the tool. The questionnaire was prepared 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. The intervention program was delivered in the 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. This was done 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.

FINDINGS AND DISCUSSION

Following results were revealed through the study:

Section 1: Demographic profile of the respondents:

It was observed that the majority (67 per cent) of the respondents were ranging in the income group of rupees 30,001 to 90,000 per month. It was found that majority of the respondents (62%) were having nuclear family type and less than half of the respondents (36.5%) were having

a joint family. Data revealed that the majority of the respondents were having 4 members in their family.

It was observed from the data that the majority of the respondents (33%) were residing in a flat. About 22.5 per cent of respondents were residing in a tenement. It was found that the majority of the respondents (33.21%) were having a potted type of kitchen garden. Nearly 25 per cent of the respondents were having their kitchen garden on the land.

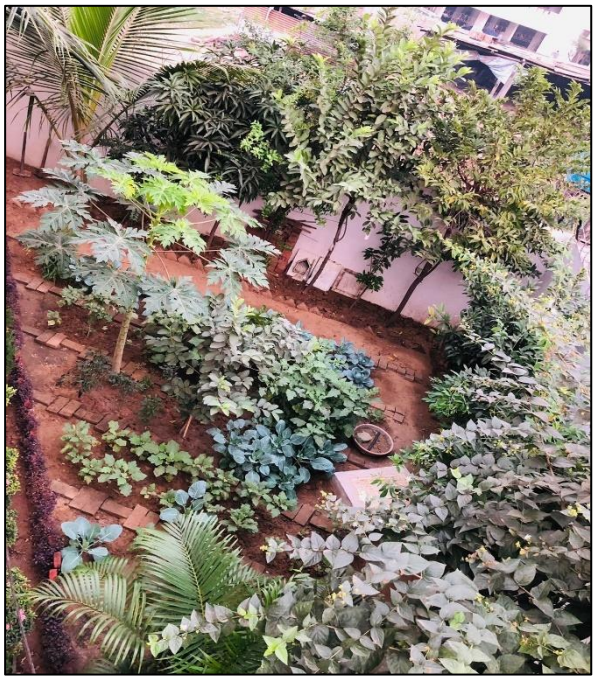


Plate 1 Rectangle Shaped Garden

It was revealed from the data that the majority of the respondents that is 90 per cent of the respondents owned the house, whereas; only 10 per cent of the respondents were having a rented house. It was found that majority of the respondents i.e., 78 per cent of the respondents were having 50-200 sq.ft. area of the garden. Very few respondents had 201 - 350 sq.ft. area of the garden. Data also revealed that more than half of the respondents i.e.; 59.5 per cent had the rectangle shape of their garden, whereas, 23.5 per cent of the respondents were having the square shape of their garden.

Section 2: Extent of Problems experienced by the Homemakers regarding their own Kitchen Garden

The problems were studied for various aspects of the kitchen garden namely; sunlight, water, and drainage, soil, food crops and rotation, pollution, compost, seedlings, plants, leaves, bud ends, and fruits.

- **Sunlight**: It was found that half of the respondents had insufficient sunlight available in their garden to a high extent. The excess of heat causing plants to dry was experienced at a high extent by nearly half (43.5%) of the respondents. More than half of the respondents had harsh sunlight entering their garden to a high extent.
- **Water and Drainage**: Data revealed that more than half of the respondents had problems regarding the water-logging causing breeding of insects, growth of unwanted algae and fungi, and clogging of drainage to a high extent. More than one-third of the respondents had problems related to water-logging causing the death of certain plants due to air blockage, affecting the growth of the food crops by damaging the roots and soil erosion to a high extent. It was also found that nearly 40% of the respondents had a problem related to watering their kitchen garden to a low extent.
- **Soil**: It was found that nearly half of the respondents had a great extent of problem of walls getting dirty due to soil and the need for the removal of weeds consuming their time. It was

also found that nearly 64% of the respondents had a high extent of problems related to an infestation of harmful pests in their garden.

- **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 great extent. Nearly 40% of the respondents had a problem related to the placement of food crops due to the shape of the garden to great extent. More than half of the respondents had a high extent of problems related to limited flexibility in plant rotation due to soil and excess heat. Nearly half of the respondents had a high extent of problems related to limited flexibility in plant rotation due to climate conditions and space. Nearly half of the respondents experienced high extent of problems related to food crops grown in a container, yield of the food crops, quality of fruits and vegetables grown in a container, maintaining the quality of soil, and protecting food crops from untamed animals.
- **Pollution**: It was found from the data that 45% of the respondents experienced low extent of problem related to odour in the kitchen garden. 40% of the respondents experienced high extent of problems related to maintaining cleanliness and maintaining food crops due to pollution.
- **Compost**: Data revealed that the majority of the respondents experienced great extent of problems related to preparing compost. Nearly 45% of the respondents faced problem related to the suitability of the compost to their plants to a high extent.
- **Seedling**: Respondents faced many problems related to various aspects of seedlings. 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. Less than half of the respondents faced problems to a high extent related to soil temperature, dryness of the soil, and birds and insects.
- **Plants**: Data showed that respondents had various problems related to plants. More than half of the respondents experienced problems related to death and wilting of plants due to disease, rotting of roots, water-logging, 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. Less than half of the respondents faced problems to a high extent related to weak and spindly plants due to poor drainage, fungal disease, vascular wilts, too much shade, crowded planting, excess nitrogen, low pH level, and wilt disease.
- **Leaves**: The findings of the study revealed that respondents experienced various problems related to leaves to a high extent. The problems included various aspects related to leaves, 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, 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.
- **Bud Ends**: The respondents faced problems related to bud ends to a high extent. 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. More than half of the respondents faced problems related to rotten bud ends due to dry weather, uneven irrigation, and insufficient calcium in the soil.

- **Fruits**: The problems related to fruit were experienced to a high extent by the respondents. 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. Nearly half of the respondents experiencedproblems related to fruits on the plants due to, too cold weather, uneven soil moisture, and improper temperature.

Distribution of the respondents regarding the extent of problems experienced by them in existing kitchen garden

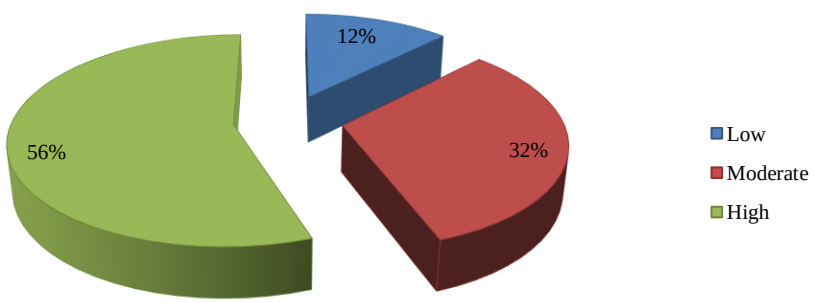
This section dealt with the extent of problems experienced by the respondents in maintaining their kitchen garden. This was a summated rating scale. The respondents were asked to respond to a 3 point continuum in terms of "always", "sometimes", "never" and the scores from 3 through 1 were given respectively to the responses. The possible scores ranged from 123 to 287 of which three categories having almost equal intervals were made. Higher scores indicated high extent of problems experienced by the homemakers.

The sample surveyed showed that majority of the homemakers lied in the high score category experiencing high extent of problems. Very few homemakers were lying in the low score category, which showed that very few were experiencing less problems in their existing kitchen garden.

TABLE 1: Frequency and percentage distribution of the respondents regarding the extent of problems experienced by them in an existing kitchen garden.

Sr. No.	Extent of Problem	Range of Score	Distribution of the Respondents (n=200)	
			f	%
1	Low	123-177	25	12.5
2	Moderate	178-232	64	32
3	High	233-287	**111**	**55.5**

Figure: 1
Extent of problems experienced by the respondents with their existing kitchen garden



AN INTERVENTION PROGRAM:

An intervention program was conducted for the respondents of the study which was focused on enhancing the knowledge of the homemakers regarding various aspects of a kitchen garden. The intervention program was delivered in 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. Problems related to sunlight, space, soil, seedlings, pests, etc. were addressed in the intervention program.

PLATE 2

Plates Showing an Intervention Program Conducted by Researcher

A Power Point presentation on the kitchen garden was shown to the respondents. The content covered the ways to solve the problems. Also developed designs of the kitchen garden for various spaces were shown to the respondents to motivate them to develop a kitchen garden on their terrace and balcony. A demonstration of potting was also shown to the respondents. The respondents were taught the proportion of soil and compost and mixing of soil for planting a sapling or sowing a seed. Demonstration was done on planting a sapling. The intervention program ended with the question-answer session.

CONCLUSION

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, the kitchen garden option for fresh vegetables and fruits for the family is adopted by many homemakers nowadays. The fruits and vegetables grown in one's kitchen garden can be chemical-free and nutritious and can be grown with the use of homemade compost. In a kitchen garden, one can grow different variety of vegetables and fruits throughout the year. But many a times, problems are experienced by homemakers related to various aspects of kitchen gardening. The problems related to sunlight, soil, drainage, pests, etc. are to be assessed before developing kitchen garden designs. Thus, the researcher gathered information regarding the problems experienced by the homemakers regarding their existing kitchen garden and through an intervention program; the researcher enhanced the

knowledge of the homemakers regarding solutions to their problems related to the kitchen garden and also the designs of the kitchen garden for various spaces in a residence.

RECOMMENDATIONS FOR FUTURE RESEARCH

1. Similar study can be conducted for different cities across the states of India.
2. Researches can be done in collaboration with government and municipal corporations for creating awareness regarding kitchen garden at large scale.

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APPENDIX 5

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Document Information

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DEVELOPMENT OF KITCHEN GARDEN DESIGNS FOR THE RESIDENCES OF VADODARA CITY SEPTEMBER 2022 KHYATI ARNAV TRIVEDI DEVELOPMENT OF KITCHEN GARDEN DESIGNS FOR THE RESIDENCES OF VADODARA CITY A THESIS SUBMITTED TO THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA IN PARTIAL FULFILMENT FOR THE DEGREE OF DOCTOR OF PHILOSOPHY (FAMILY AND COMMUNITY RESOURCE MANAGEMENT) By KHYATI ARNAV TRIVEDI DEPARTMENT OF FAMILY AND COMMUNITY RESOURCE MANAGEMENT FACULTY OF FAMILY AND COMMUNITY SCIENCES THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA VADODARA 2022

DEPARTMENT OF FAMILY AND COMMUNITY RESOURCE MANAGEMENT FACULTY OF FAMILY AND COMMUNITY SCIENCES THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA VADODARA CERTIFICATE This is to certify that the thesis entitled “Development of Kitchen Garden designs for the Residences of Vadodara City” submitted for the partial fulfillment of the requirement for the degree of Doctor of Philosophy in the Faculty of Family and Community Sciences (Family and Community Resource Management) to the Maharaja Sayajirao University of Baroda has been carried out by Ms. Khyati Arnav Trivedi under my supervision and the work is genuine. The contents presented herein have not been submitted for the award of any Degree or Diploma. Khyati Arnav Trivedi Dr. Sarjoo Patel, Investigator Research Guide, Assistant Professor (Stage III), Department of Family and Community Resource Management, Faculty of Family and Community Sciences, The Maharaja Sayajirao University of Baroda, Vadodara, Gujarat

DEDICATED TO MY LOVING DAUGHTER “ANAYA”

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