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New Concepts of Demographic Data of Cities towards Urban Agricultural and Research Approaches

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Abstract-: The study of urbanity research goes through the demographic data of cities. The demographic data include the all activities of the people related to the activities of different concepts such as the family members involving, occupational study and building place position and the status. Urban farming on different building followed rooftop garden, balcony garden terrace garden Vertical garden, Z- farming and also aquaponics hydroponics aroponics. All has position based cultivation of the building. All are include in urban agriculture. The present study survey methods through respondents the primary data gathered by the direct contact and questionnaire to the urban farmers, in smart city Bhubaneswar a planning city of country India. The data has been collected with semi-structured interview from respondent answers. Further the questioner has been open-ended and collect data has recorded in tabulated forms and analysis the data. Distribution of family members involved on urban agriculture, the Gender female were more distributions Involved on urban agriculture than male.

Keywords-: Building, City, Demographic, Gender, Occupation, Urban Agriculture.

1. INTRODUCTION

The research survey method on urban agriculture meets the different concepts like as the demographic buildings and the farming systems. The formal demographic analysis is the scientific and statistical study of expanded human population including their size (number) of family structure, category, distribution, and gender, and occupation, economic and social status of the family. The social amenity studied characteristic, age, gender, education and ethics research. Further the building include the place, position, storied, structure, density looking in to suitable for Urban agriculture. The urban agriculture is approached to the rooftop garden (RTG), rooftop farming (RTF), kitchen garden (KG), Terrace garden (TG), Balcony garden (BG). Vertical garden (VG) also includes the hydroponics, aroponics and soilless culture by media. The demographic, materials, gathered the data and analysis the data method play an important rule for urban agricultural research.

2. REVIEW OF LITERATURE

Research is an endeavor in the pursuit of truth with the help of survey, observation, analysis, experimentation, and interpretation. Any investigation is guided by plenty of available knowledge which is known as review of literature. As such knowledge is gained and improved by studying the known and revising this past knowledge in the light of the new findings. The review of literature pertaining to the present study has been put here under separate heads. The concept of the urban agriculture has been adhered the demographic, physical and the buildings.

Methods and practical applications in applied demography in city farmers for urban agriculture. (Thomas, R. K., 2018), (Robert Schoen.,2016), Rychtaříková J. (2009) Yusuf F., Martins J.M., Swanson DA. (2014.). Fundamentals of demographic analysis and concepts, measurement and methods. The United States Census Bureau (2021). Pressat R. demographic analysis methods, results and applications. New York .Aldine, (1972), Hoem J.M. (2001).Demographic analysis of probabilistic approach. Bernardi, L. (2007). An introduction to anthropological demography by Max Planck Institute for Demographic Research, Germany accessed on: July 19, 2019.Bogue, D. J., (1969). And principles of demography, New York: Wiley. Bryan, T. (2004). Basic Sources of Statistics. Majumdar, P. K. (2010). Fundamentals of demography, New Delhi: Rawat Publications. Poston, D L.et al. (2010). Population and Society: An introduction to Demography, Cambridge: Cambridge University Press. Riley, N E. (1998). Research on Gender in Demography: Limitations and Constraints. Population Research and Policy Kirk, Dudley. 1968. 'The Field of

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Demography', in Sills, David. ED International encyclopedia of the social sciences. Rooftop farming also includes growing plants on balconies and window panes beside rooftops. The difference between RTG and RTF is that the latter covers a large area with small commercial interest whereas the former (RTG) covers a small area mostly for hobby. It was German architect (Von Rabitz and Abram, 2006) who first introduced the concept of RTG in the 1960 and it is spreading very fast now with the expansion of cities and rural-urban migration. RTF is also called green roofs, living roofs, and eco-roofs as concrete roofs are covered with trees, shrubs, etc (Sajjaduzzaman et al., 2016). Bhuyan and Ferdous (2021) from Dhaka city have reported that 43 and 40% of urban farmers were using rooftops and balconies for farming purposes.

3. RESEARCH METHODOLOGY

3.1 The Study Area:

The study area was conducted in Bhubaneswar city with its 67 wards. Bhubaneswar is situated in 20. 27º N 85. 84ºE. longitude and latitude 20. 2961º N, 85. 8245º E. Bhubaneswar is one of the smart cities in India and the capital of Odisha. Its population covers 837,321 million as per census 2011. With a population density of 4,500 per sq. km. The city area of Bhubaneswar is 186 sq.km.with 67 wards. (Suchitra, 2015) reported that 16% of people are cultivating RTF as 2024.

3.2. Methods:

The present study has been carried out in Bhubaneswar city and is based on multisource data collected through survey and semi-experimental design. The design of the study has been depicted in starting from the formulation of objectives to the conclusion and recommendations. The primary data were collected through a personal physical survey of the building, rooftop farms, garden, balconies and indoors followed by questionnaires, structured interviews and focused discussion on various issues. Some experimental data were collected from a few houses through personal study.

4. RESULT AND DISCUSSION

4.1 Demographic study towards urban agriculture.

Demographic study of urban agriculture includes the building condition number and position. The Study carried out family status like gender. age, occupation, etc. The recent study enumerate of farms in terms of position, structure and technology. The documented data on the types of farms, including rooftop gardens (RTGs), based on survey responses. The categories of farms are RT/VG, RTG, RTG/BG, and RTG/TG, that of 160 respondents. Collection of primary data gathers in tabulated form and analyze.

Table 4.1 Distribution of Family Members Involved on Rooftop Farming.

Family Members

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid Members	2	7	4.4	4.4	4.4
	3	25	15.6	15.6	20.0
	4	39	24.4	24.4	44.4
	5	29	18.1	18.1	62.5
	6	30	18.8	18.8	81.3
	7	18	11.3	11.3	92.5
	8	12	7.5	7.5	100.0
	Total	160	100.0	100.0	

The table 4.1 presents study data on the number of family members among a sample of 160 respondents. It shows the frequency, percentage, valid percentage, and cumulative percentage for each family size category. The most common family size is 4 members, with 39 respondents (24.4%) reporting this number, followed by 5 members with 29 respondents (18.1%) and 6 members with 30 respondents (18.8%). The least common family sizes are 2 members (4.4%) and 8 members (7.5%). The cumulative percentage column indicates the progressive total percentage of respondents up to each category (Fig. 4.1). For instance, 44.4% of respondents have up to 4 family members, and this figure increases to 100% for those with up to 8 family members. This distribution provides an overview of the family size distribution within the sample.

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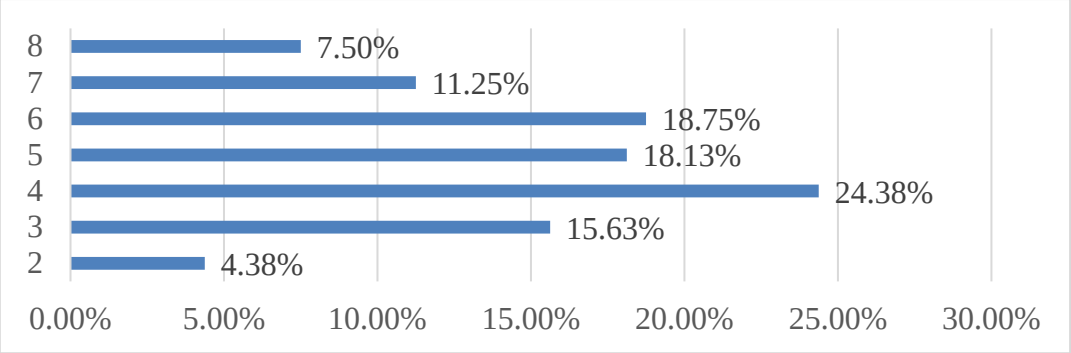

Fig. 4. 1 Distribution of Family Members.

Table 4. 2 Gender Distributions Involved on Rooftop Farming.

Genders

Genders		Frequency	Percent	Valid Percent	Cumulative Percent
Valid Genders	Female	63	39.4	39.4	39.4
	Male	97	60.6	60.6	100.0
	Total	160	100.0	100.0	

The summary of the gender distribution among a sample of 160 respondents. It shows that there are 63 females, representing 39.4% of the sample, and 97 males, representing 60.6% of the sample. The total number of individuals surveyed is 160, Fig. 4.2, accounting for 100% of the sample population. This indicates that the sample has a higher proportion of males compared to females has been reflected in table 4.2.

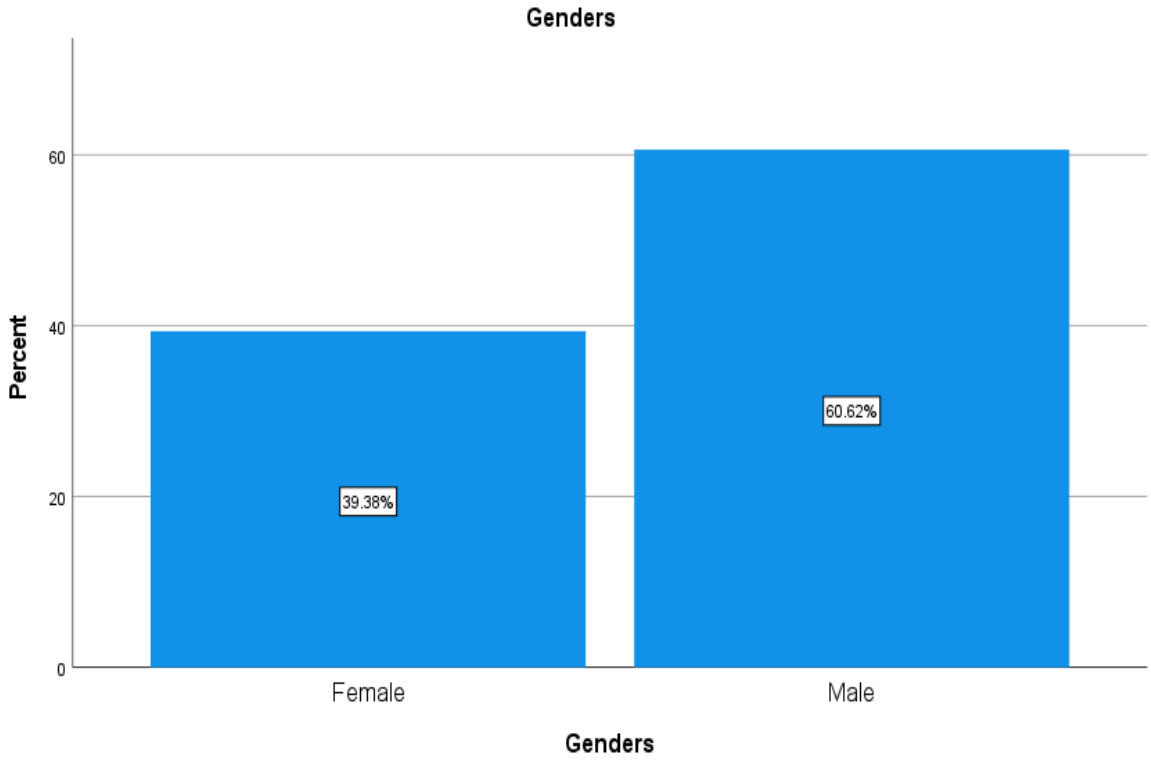

Fig. 4. 2 Gender Distribution Involved on Rooftop Farming.

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4.2 Study of Building towards Urban agriculture.

Table 4. 3 Distribution of residential building type.

Building type

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid Building	Apartment	4	2.5	2.5	2.5
	Flat	3	1.9	1.9	4.4
	Own	139	86.9	86.9	91.3
	Rent	14	8.8	8.8	100.0
	Total	160	100.0	100.0	

The table 4. 3 present a distribution of responses regarding different residential building types. Out of the total 160 responses, the majority of individuals, 86.9% (139 people), reported owning their building, which is the most common response. Rental properties are the next most frequent category, with 8.8% (14 people) indicating that they rent their building. Apartments and flats are less common, with only 2.5% (4 people) reporting living in an apartment and 1.9% (3 people) in a flat (Fig. 4. 3). The cumulative percent column shows that 91.3% of respondents either own their building or rent it, while the remaining 8.8% live in apartments or flats.

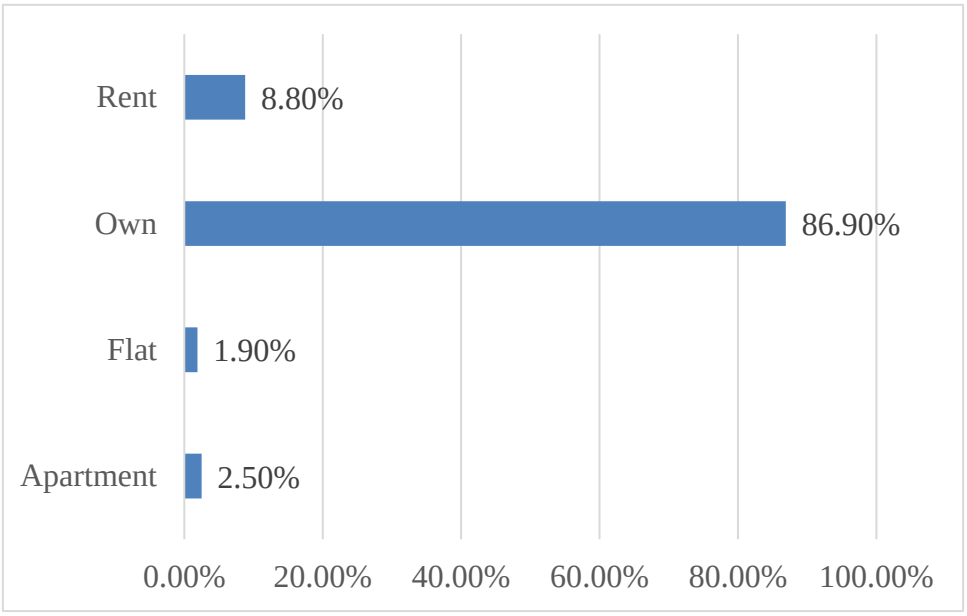

Fig. 4. 3 Distribution of Building types.

4.2.1 Buildings and Cultivated Storied.

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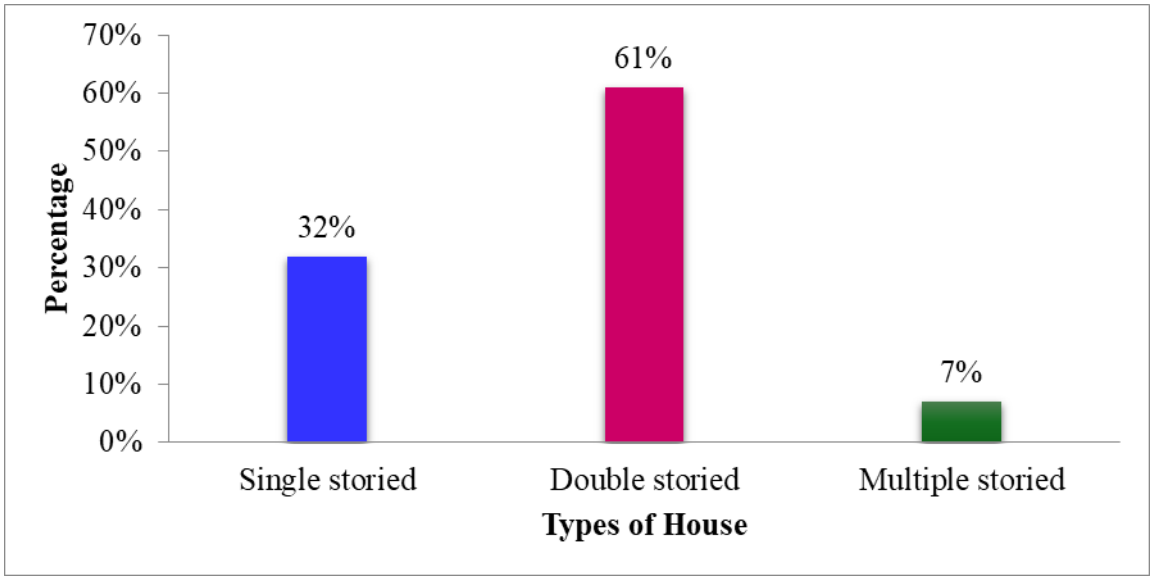

Fig. 4. 4 Types of Houses Used in the Study for RTF.

The present study on rooftop farming carried out in sample buildings were all Pucca (concrete) houses. Of the total buildings a majority of 61% was double-storied, and 32 and 7% percent buildings were single and multiple-storied houses respectively Fig. 4.4.

4. 2. 2 Buildings and Cultivated Areas.

Regarding the average cultivated area on the rooftop, 4.0% of the buildings had less than 500 sq. ft. area and 13% had 500 to 1000 sq. ft. area. Eighteen percent of the building had an area of 1001 to 1500 sq. ft. Rest of the buildings had a cultivated area of 1500 sq. ft. This area varies from region to region and during the winter season, the maximum area was covered under cultivation (Fig. 4. 5).

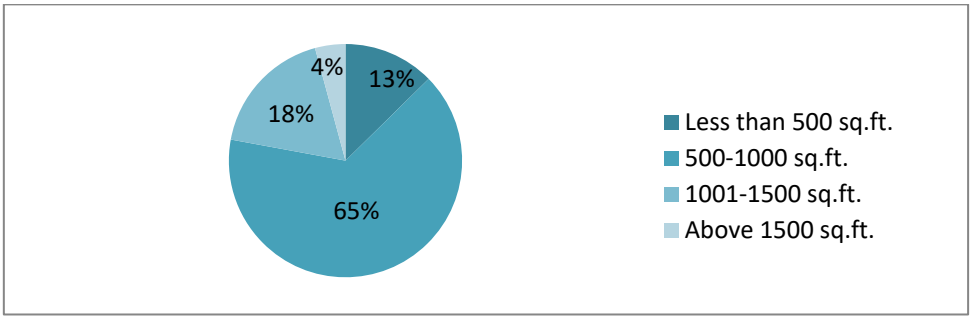

Fig. 4. 5 Areas of Selected RTGs in Bhubaneswar.

4.2.3 Building Areas.

Table 4. 4 Frequency Distribution of Buildings (Area in square feet).

Building (Area in square feet).

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid Areas	1400	3	1.9	1.9	1.9
	1600	25	15.6	15.6	17.5
	1800	34	21.3	21.3	38.8
	1900	7	4.4	4.4	43.1
	2000	60	37.5	37.5	80.6
	2200	19	11.9	11.9	92.5
	2300	3	1.9	1.9	94.4
	2400	5	3.1	3.1	97.5
	2600	1	.6	.6	98.1

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	3000	3	1.9	1.9	100.0
	Total	160	100.0	100.0	

In the present study the frequency distribution of buildings based on their area sizes. There are ten different area sizes ranging from 1400 to 3000 square feet. The most common area size is 2000 square feet, with 60 buildings, making up 37.5% of the total. This is followed by 1800 square feet (21.3%) and 1600 square feet (15.6%). The least common sizes are 1400, 2300, and 3000 square feet, each with 3 buildings (1.9% each), and 2600 square feet with only 1 building (0.6%). The cumulative percent column shows the running total of the percent values, reaching 100% at the end. For example, 43.1% of the buildings have areas up to 1900 square feet, and 97.5% of the buildings have areas up to 2400 square feet depicted in Fig. 4. 6. The total number of buildings in the dataset is 160; accounting for 100% of the distribution has been depicted in table 4.4.Maximum of area of urban cultivated building study 1600-2200 Sq. ft.

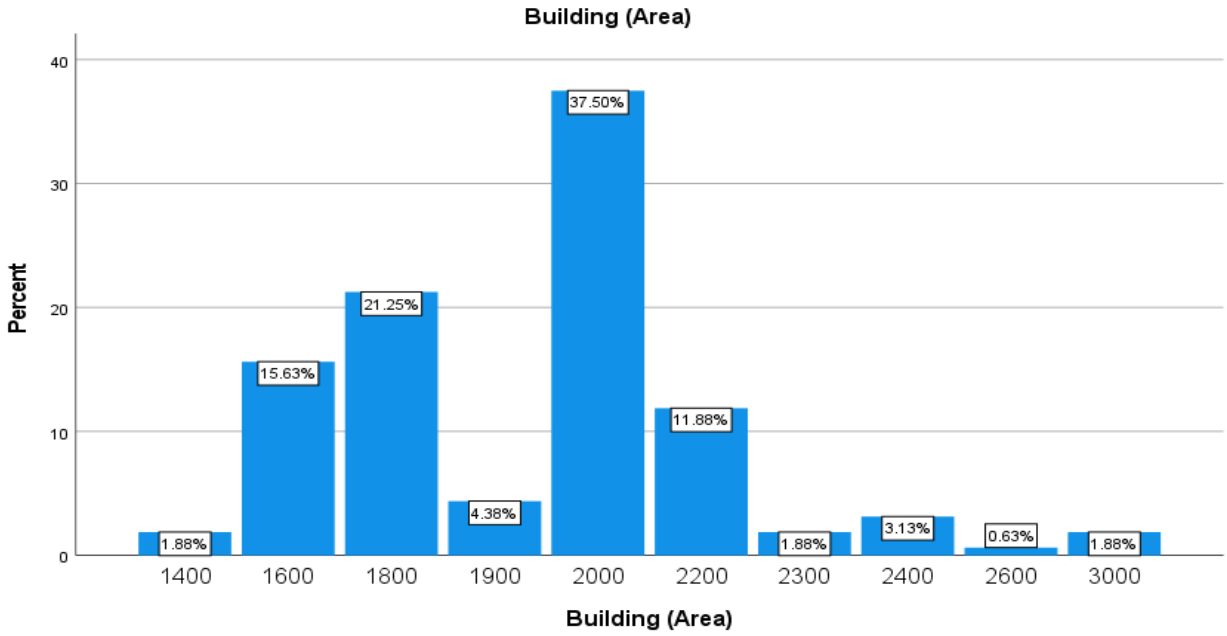

Fig. 4. 6 Frequency Distribution of Buildings.

4.2.4 Floors in the cultivated building.

Table 4. 5 Distributions of Respondents across Different Floors in the building.

Floors

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid Floors	1st	50	31.3	31.3	31.3
	2nd	77	48.1	48.1	79.4
	3rd	33	20.6	20.6	100.0
	Total	160	100.0	100.0	

The table 4.5 present studies the distribution of respondents across three different floors. Out of 160 total respondents, 50 (31.3%) are from the 1st floor, 77 (48.1%) are from the 2nd floor, and 33 (20.6%) are from the 3rd floor. The "Valid Percent" and "Cumulative Percent" columns mirror the "Percent" values since there are no missing data. Thus, the "Valid Percent" for the 1st floor is 31.3%, for the 2nd floor is 48.1%, and for the 3rd floor is 20.6%. The "Cumulative Percent" column shows the running total, reaching 100.0% by the 3rd floor, indicating that all respondents have been accounted for agricultural concrete lands **(**Fig. 4.7).

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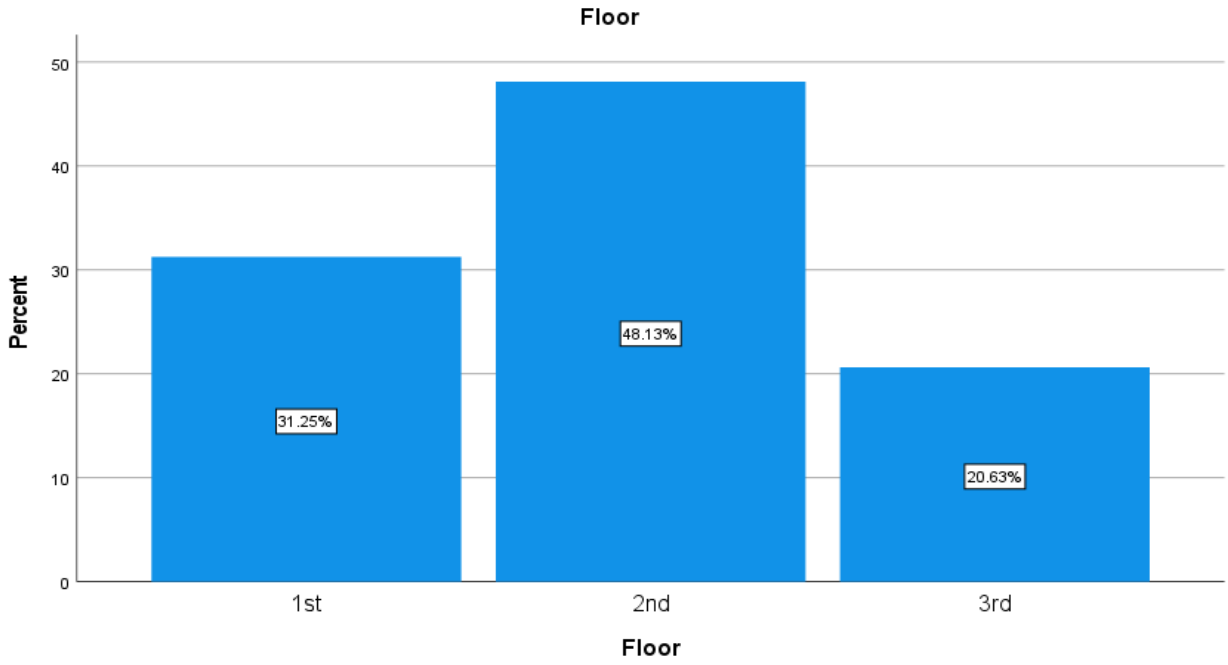

Fig. 4.7 Distribution of Respondents across Different Floors.

4.3 Study of Various Garden in the Building.

Table 4. 6 Type of (Farm, including RTGs).

Type of (Farm, including RTFs)		Frequency	Percent	Valid Percent	Cumulative Percent
Valid RTF+Farms	RT/VG	3	1.9	1.9	1.9
	RTG	107	66.9	66.9	68.8
	RTG/BG	24	15.0	15.0	83.8
	RTG/TG	26	16.3	16.3	100.0
	Total	160	100.0	100.0	

The table 4. 6 depicted data on the types of farms, including rooftop gardens (RTGs), based on survey responses. The categories of farms are RT/VG, RTG, RTG/BG, and RTG/TG. Out of 160 respondents, 3 (1.9%) indicated they have RT/VG (possibly rooftop or vertical gardens), 107 (66.9%) have RTG (rooftop gardens), 24 (15.0%) have RTG/BG (rooftop and backyard gardens), and 26 (16.3%) have RTG/TG (rooftop and terrace gardens) presented in Fig. 4.8. The valid percent column aligns with the frequency percentages, and the cumulative percent shows the progressive total, reaching 100% with the RTG/TG category. Overall, the majority of respondents (66.9%) have rooftop gardens, highlighting the prevalence of this farming type among the survey participants.

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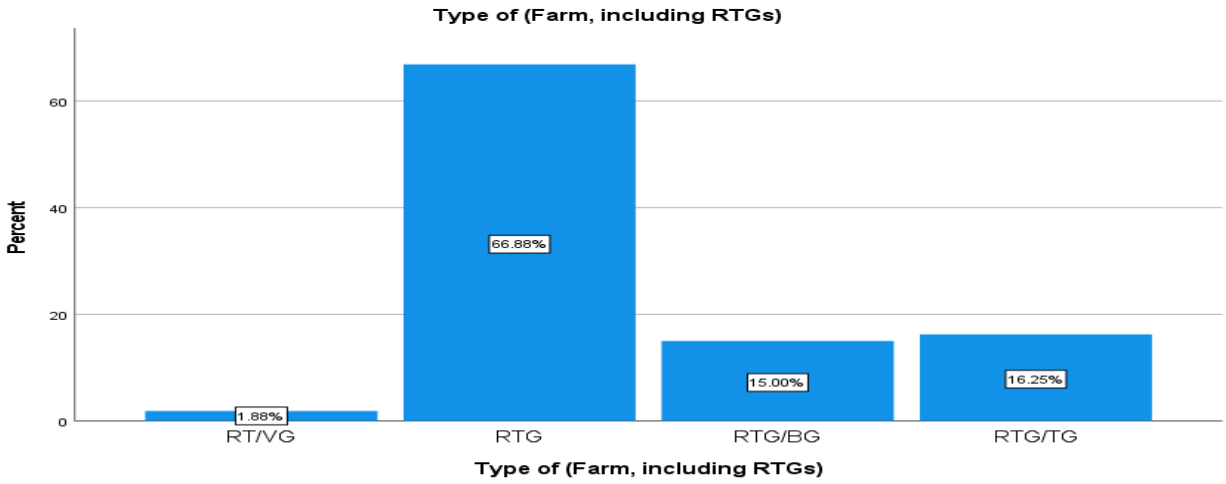

Fig. 4. 8 Type of (Farm, including RTGs)

4.4 Study of Urban People Occupation involved in Urban Agriculture.

Table 4. 7 Frequency Distribution of Occupation of Respondents.

Occupations

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid Occupations	Businessman	6	3.8	3.8	3.8
	Govt. service	102	63.7	63.7	67.5
	House wife	43	26.9	26.9	94.4
	Retd. Service	9	5.6	5.6	100.0
	Total	160	100.0	100.0	

The table 4. 7 and Fig.4.9 provides a breakdown of respondents' occupations in a survey. Out of a total of 160 respondents, 6 (3.8%) are businessmen, 102 (63.7%) are employed in government service, 43 (26.9%) are housewives, and 9 (5.6%) are retired from service. Each occupation's valid percent matches its overall percent contribution since there are no missing data. The cumulative percent column shows the cumulative total percentage up to each category, culminating in 100%. Thus, the majority of respondents (63.7%) is in government service, followed by housewives, businessmen, and retired individuals.

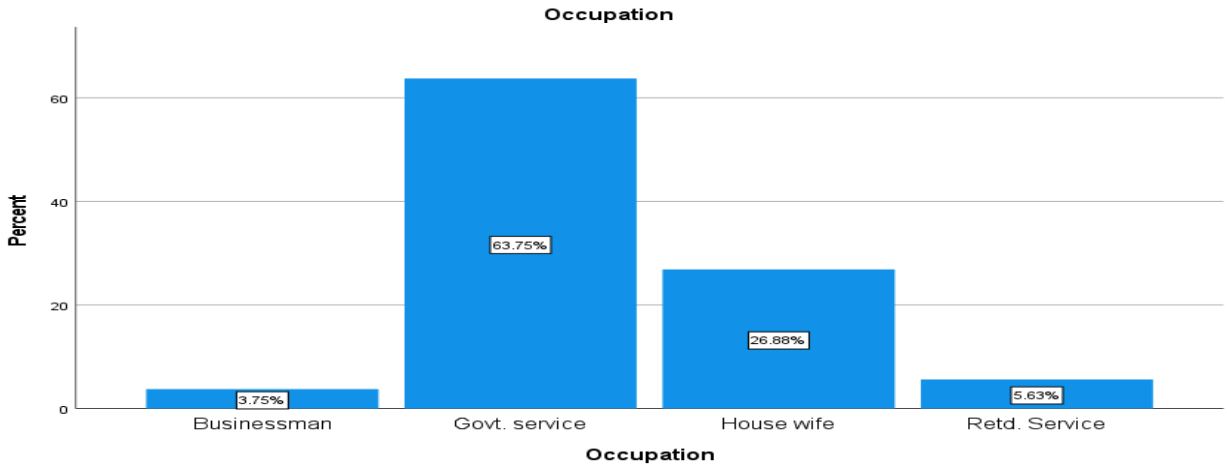

Fig. 4. 8 Frequency Distribution of Different Occupations of the Respondents

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4.5 Category of Farms on Buildings.

Table 4. 8 Distributions of Different Types of Farms/Gardens on Buildings.

Type of Farms

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid Farms	RTF/BG	40	25.0	25.0	25.0
	RTF/TG	24	15.0	15.0	40.0
	RTF/VG	10	6.3	6.3	46.3
	RTG	86	53.8	53.8	100.0
	Total	160	100.0	100.0	

(RTF=Rooftop Farming, RTG=Rooftop garden, BG=Balcony Garden, VG=Vertical Garden,TG=Terrace Garden.)

The table 4.8 presents data on the combine distribution of different types of farms. There are four categories of farms: RTF/BG, RTF/TG, RTF/VG, and RTG. Out of a total of 160 farms surveyed, 40 farms (25.0%) are classified as RTF/BG, 24 farms (15.0%) as RTF/TG, and 10 farms (6.3%) as RTF/VG. The majority, 86 farms (53.8%), fall under the RTG category (Fig. 4.10). The cumulative percentages indicate the progressive accumulation of the farm types, showing that after adding the RTF/TG farms to the RTF/BG farms, 40.0% of the total farms are accounted for. Including RTF/VG brings the cumulative total to 46.3%, and finally, adding RTG covers 100% of the farms surveyed. Thus, the RTG farms constitute the largest group, while the RTF/VG farms are the smallest.

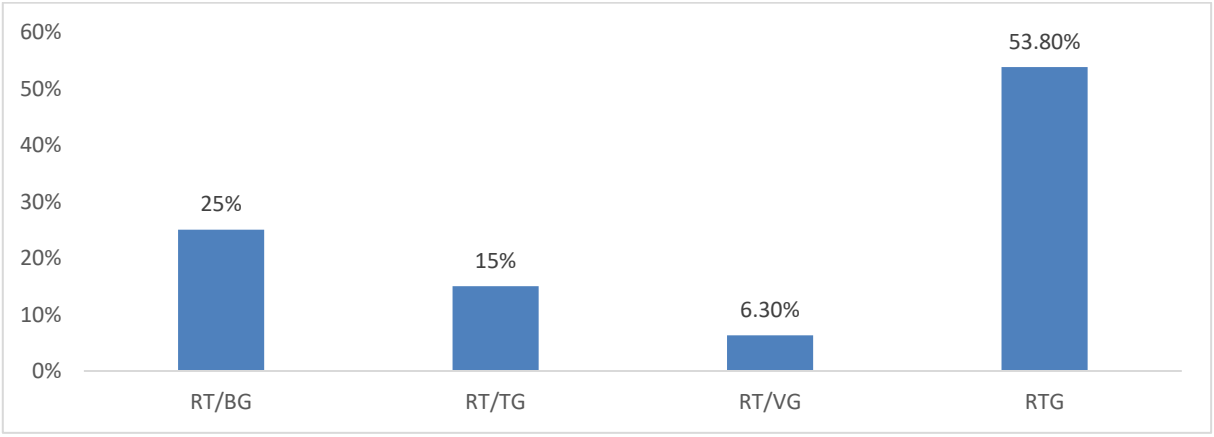

Fig. 4. 10 Distributions of Different Types of Farms within the Buildings

4.6 Study of Duration of the Rooftop Farming.

Table 4. 9 Duration of Rooftop Garden (in years)

Duration of RTF (in years)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid Years	4	2	1.3	1.3	1.3
	5	7	4.4	4.4	5.6
	6	6	3.8	3.8	9.4
	7	4	2.5	2.5	11.9
	8	7	4.4	4.4	16.3
	9	5	3.1	3.1	19.4
	10	3	1.9	1.9	21.3
	11	13	8.1	8.1	29.4
	12	6	3.8	3.8	33.1
	13	7	4.4	4.4	37.5
	14	10	6.3	6.3	43.8
	15	5	3.1	3.1	46.9

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	16	9	5.6	5.6	52.5
	17	12	7.5	7.5	60.0
	18	9	5.6	5.6	65.6
	19	10	6.3	6.3	71.9
	20	3	1.9	1.9	73.8
	21	6	3.8	3.8	77.5
	22	3	1.9	1.9	79.4
	23	2	1.3	1.3	80.6
	24	6	3.8	3.8	84.4
	25	7	4.4	4.4	88.8
	26	4	2.5	2.5	91.3
	27	7	4.4	4.4	95.6
	28	3	1.9	1.9	97.5
	29	2	1.3	1.3	98.8
	31	1	.6	.6	99.4
	32	1	.6	.6	100.0
	Total	160	100.0	100.0	

The table 4. 9 dipicted a detailed distribution of the duration of RTF (Rooftop Farming) in years among a sample of 160 respondents. The frequencies indicate the number of respondents who have practiced rooftop farming for each specific duration, ranging from 4 to 32 years. For instance, 2 respondents reported practicing for 4 years, making up 1.3% of the total. The highest frequencies are observed for durations of 11 years (13 respondents) and 17 years (12 respondents), each representing notable portions of the sample (8.1% and 7.5%, respectively). The table also includes the cumulative percentages, showing how duration has contributed to the overall distribution. For example, by 17 years, 60% of the sample's data is accumulated, while 80.6% of respondents have been involved in rooftop farming for up to 23 years. The cumulative percentages help to understand the concentration of data and the distribution of responses across the different durations of rooftop farming.

5. CONCLUSION

The recent study has been followed family by 5 members with 29 respondents (18.1%) and 6 members with 30 respondents (18.8%). the gender sample has a higher proportion of males compared to females has been reflected towards rooftop farming. The residential house data of that 91.3% of respondents either own their building or rent it, while the remaining 8.8% live in apartments or flats, own house has been the most of the rooftop farming. The rooftop farms has founded the total buildings a majority of 61% was double-storied, the maximum area 500Sq to1000Sq feet was covered under rooftop farming cultivation. 43.1% of the buildings have areas up to 1900 square feet, and 97.5% of the buildings have areas up to 2400 square feet. Highest cultivation for the 2nd floor is 48.1%. Most of the RTG/TG category has been overall the majority of respondents (66.9%) have rooftop gardens. Next in the study majority of respondents (63.7%) are in government service, followed by housewives, businessmen, and retired individuals respectively engage in the rooftop farming. The RTG farms constitute the largest group, while the RT/VG farms are the smallest in urban farming. 80.6% of respondents have been involved in rooftop farming for up to 23 years old. The study of demographic, buildings and farms position in terms of rooftop farming has the prospective of research.

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