

**FACTORS AFFECTING HOME BUYER'S PREFERENCES
OF BUYING A HOUSE IN PUNE METROPOLITAN
REGION**

Thesis Submitted for the Award of the Degree of

DOCTOR OF PHILOSOPHY

in

Architecture

By

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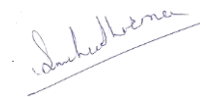
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**LOVELY PROFESSIONAL UNIVERSITY
PUNJAB
2023**

Declaration

This is to declare that I have completed and submitted my research entitled '**Factors Affecting Home Buyer's Preferences of Buying a House in Pune Metropolitan Region**' under the supervision of Dr. Tej Kumar Karki. This research is my original work. I have duly cited all the references used in the study.



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Certificate from Supervisor

This is to certify that the PhD scholar Sharma Sneha Suresh (41800706) has met most of the requirements for her PhD thesis submission and her thesis work has reached a satisfactory level for PhD.

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Abstract

Pune Metropolitan Region (PMR) in India, is growing rapidly in terms of employment opportunities, urban amenities and infrastructure. Many new housing projects are emerging in PMR. But so far not enough attention has been given to understanding home buyers' housing preferences in PMR. Hence, the research objective of this study is to understand important factors affecting home buyers' preferences of buying a house in PMR.

For the purpose of the study, 39 factors in the context of PMR were identified. These factors were divided into six broad categories such as Connectivity and transportation, Proximity to amenities, Facilities and services, Economy, Social Aspects, Architectural Design and planning of housing projects and Quality of residential environment and surroundings. Further, an interview survey was conducted among the home buyers in PMR. 501 home buyers participated in the survey. Also, some of the private housing developers in PMR and a Ph.D. holder in the field of housing in PMR were interviewed. Major findings of the study were based on the responses given by home buyers. Descriptive statistics, Binary Logistic Regression and Hypothesis Testing were used to analyze the responses collected from the interviews of home buyers. The study has six hypotheses viz. H1: Home buyers prefer to buy houses considering 0-30 minutes driving distance from connectivity and transportation facilities, H2: Home buyers prefer houses where the bus stop is located within 15 minutes walking distance from the house, H3: home buyers consider amenities and facilities available within the proximity of 0 to 30 minutes driving distance, H4: Home buyers prefer houses where proximity to convenience stores is within 15 minutes walking distance while buying a new house, H5: home buyers consider factors related Architectural Design and planning of the project which include natural ventilation, natural daylight, views from the house, size and typology of the house and H6: Home buyers consider all factors related quality of residential environment and Surroundings.

Key results of the study show that home buyers are more likely to prefer houses located within 0-30 minutes driving distance from connectivity and transportation facilities. Connectivity to Mumbai-Pune connecting corridor is the most important factor. Home buyers are more likely to prefer to buy houses in the residential areas around bus stops, BRT corridors and metro stations. Amenities, facilities and services available within the proximity of 0-30 minutes driving distance are important factors. The most preferred amenities by home buyers in PMR are convenience stores, hospitals, schools/educational institutes, shopping malls, restaurants, entertainment centers and workplaces. A large group

of home buyers in PMR is from the income group 6 lacs to 10 lacs. The most preferred housing type in the study area is 2BHK followed by 1 BHK apartment unit. The housing-unit floor area range in the study area is 401 sq. ft to 800 sq. ft. While buying a house, the most important factors related to social aspects are the status of education of residents in the neighborhood, the residential area near to locality where home buyer's relatives and friends are living and health requirements of elders in the house. Natural ventilation, area of the house, typology of the house and views from the house are important factors in terms of Architectural Design and planning of the housing project. Important factors related to the quality of the residential environment and surroundings are a house not in close proximity to crematoriums or burial grounds, housing projects which have basic services like parking, lift, 24X7 water supply and security, not in close proximity to slums, away from city traffic, pollution and congested areas, the neighborhood which has the good visual appearance, housing projects with children play area, jogging track, a green space like public garden and locality which has scope for real estate and urban infrastructure development in near future.

These insights would be useful for local planning authority and for private housing developers to provide housing development based on important housing preferences of home buyers in PMR. Based on the housing preference insights, this study has made some recommendations for residential zoning in PMR. These recommendations are indicative and the concerned authorities should further tailor the recommendations to suit the unique local context.

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Chapter 1. Introduction

1.1 Background of the study

Constant research in the domain of housing preferences is indispensable in the current Indian metropolitan developments. As physical and economical growths of cities, lifestyles and needs of people change, the factors affecting home buyer's housing preferences can also change with time. Hence, the urge to find out important factors affecting home buyer's housing preferences has led me to carry out this research in Pune Metropolitan Region (PMR) in India.

Residential development and metropolitan growth go hand in hand. Integrating housing preferences is important for efficient residential development in the metropolitan region. Efficient residential development is possible if local planning authorities and housing developers are more conscious of the current housing preferences of people in the region. Housing developers may have to bear adverse effects such as unsold housing stock if residential units are not as per the requirements of home buyers (HCCH Coolen & Jansen, 2012). With the systematic study on housing preferences, local planning authorities can encourage people's need-friendly housing projects in the developing urban sprawl.

Housing preferences study is vast. It requires consideration of diverse factors that are influencing the housing choices of home buyers. Residents' criteria to buy houses vary with a place, its context and time. Also, people take home-buying decisions on the basis of the characteristics of houses (Zinas & Jusan, 2012). Researchers from different expertise, study multiple dimensions of housing preferences (Henny Coolen & Hoekstra, 2001). "There is also a great variety in methodological approaches for the measurement of housing preferences" (Henny Coolen & Hoekstra, 2001, p. 285) (Timmermans et al., 1994).

The study of housing preferences in the context of the metropolitan region is the core requirement to formulate new residential development policies in the best interest of residents. Also, it can help housing developers to deliver housing units as per home buyers' preferences. Thus, the focus of this research is to find out important factors affecting home buyer's housing preferences in the study area.

1.2 Statement of the research problem

Pune Metropolitan Region (PMR) is rapidly urbanizing and people are buying houses in newly developed projects. However, there is no adequate and systematic study

available for understanding the housing preferences of home buyers in Pune Metropolitan Region (PMR). “Housing development without enough knowledge of housing preferences can lead to the mismatch between housing units provided by housing developers and housing choices of home buyers” (Sharma, 2021, p. 54). Instead of getting housing products of the residents’ choice, the residents would have to choose what is supplied by the developer. For example, if the only available housing products are far away from the urban amenities, it adds transportation costs and inconvenience to the residents. A long list of factors of housing preferences in the settings of PMR is required to be identified and to be analyzed to find out what are the important factors affecting home buyer’s housing preferences in PMR.

1.3 Research question and research objective

This study is focusing on finding answers to the following research question:

What are the important factors affecting home buyer’s preferences of buying a house in Pune Metropolitan Region?

Following are the research objectives of the study:

1. To understand the important factors affecting home buyer’s preferences of buying a house in Pune Metropolitan Region.
2. To analyze the different dimensions of factors affecting housing preferences in PMR through statistical analysis.
3. To recommend indicative proposals for housing development in PMR

1.4 Methodology

Here, is the brief introduction to research methodology and Chapter 4 will discuss it more in detail. This study was conducted in Pune Metropolitan Region (PMR) in the state of Maharashtra in India. Several factors affecting home buyer’s housing preferences were identified in the context of PMR. This research targets home buyers in PMR to find out their important housing preferences. Primary data was collected by randomly interviewing home buyers who have recently bought a house in the last 5 years and those who are willing to buy a house in the next 5 years in PMR. This study uses Descriptive statistics and Binary Logistic Regression for testing hypotheses and to analyze factors of housing preferences.

1.5 Research relevance and rationale

This research helps to understand important factors affecting home buyer's preferences of buying a house in PMR. The important factors of housing preferences identified in this study will guide local planning authority to develop a new residential development policy that best reflects people's housing preferences. From this study, housing developers will get to know what are the important housing preferences that home buyers care about the most while buying a house in PMR. Eventually, it will help housing developers to produce housing units in PMR as per the requirements of home buyers.

1.6 Limitations of the research

In this research home buyers in PMR are interviewed for quantitative analysis. Considering the pandemic situations of COVID19, interviews of the home buyers were conducted through Telephonic Discussions and their responses were recorded through Online Google Forms. Home buyers who are residents in PMR are interviewed in this research. Home buyers residing in other cities around PMR who are willing to buy a house in PMR are not included in this research. The major findings of the research are based on the quantitative analysis. Qualitative analysis is an additional part to strengthen the findings from the quantitative analysis. The primary aim of this research is to answer the research question. Thus, this research would not go into detail housing preference planning and architectural proposal for PMR. The findings of this study would help to provide indicative recommendations for housing preferences in PMR. The concerned local planning authorities should further tailor the recommendations to suit the local context. This research has used Binary Logistic Regression for testing the hypotheses. This study is not considering the perspectives of economic housing/affordable housing.

1.7 Organization of thesis

The study includes seven chapters as follows:

Chapter 1 is the introduction to the research study. It comprises the background of the study, statement of the research problem, research question and research objective, brief methodology, research relevance and rationale, limitation of the research and brief organization of the study into the number of chapters.

Chapter 2 of the study is about literature review. This chapter includes a critical review of housing preferences studies conducted by many researchers in various parts of the world. Literature review chapter explains some of the methods used in previous studies

for the measurement of housing preferences. Also, important factors of housing preferences are identified from the previous research. The last section of Chapter 2 is about the Pune Metropolitan Region.

Chapter 3 comprises a research gap based on a literature review.

Chapter 4 is about the identification of factors of housing preferences relevant to study in Pune Metropolitan Region. Also, the importance of these factors in the context of Pune Metropolitan Region is discussed in this chapter. Further, this chapter includes a theoretical framework based on the identified factors.

Chapter 5 is about the detailed methodology of the research. It includes a detailed discussion on research methods used for data collection, sample selection, questionnaire design, interviews surveys and statistical analysis methods.

Chapter 6 is about the discussion on results from Descriptive Statistics, Binary Logistic Regression and Hypotheses Testing. The last section of this chapter includes a summary of analysis where important factors found out in this research are discussed.

Chapter 7 includes the conclusion of the study, recommendation implications, indicative proposals and scope for future research.

Following flowchart presents the overall approach implemented for this thesis:

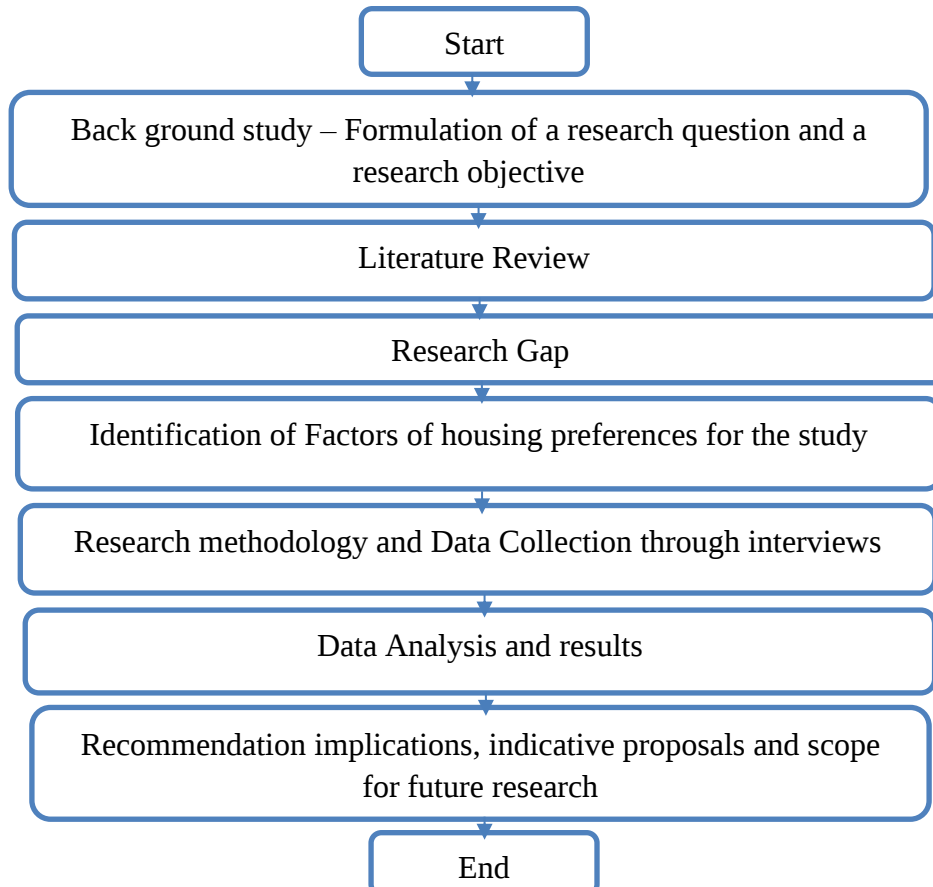


Figure 1.1 Flowchart presenting the overall approach implemented for the thesis

Chapter 2. Literature Review

2.1 Housing preferences

Housing preferences are dynamic (Zinas & Jusan, 2012) (Henny Coolen & Hoekstra, 2001). People buy houses based on a variety of alternatives of housing characteristics and fundamental inspirations (Zinas & Jusan, 2012) (Henny Coolen & Hoekstra, 2001).

The main purpose of the literature review in this research is to identify and understand factors affecting housing preferences. This chapter discusses various factors of housing preferences studied by many researchers in the countries outside India and in the cities of India as follows:

2.1.1 Factors affecting housing preferences

Here, previous researches based on similar types of study purposes are grouped and they are critically analyzed.

Proximity to school

Proximity to a good school is the important housing preference for families with children (Skifter Andersen, 2011). Chin & Foong (2006) conducted research in Singapore to study the relationship between accessibility to renowned schools and housing cost using a hedonic housing price model. In the housing market of Singapore, proximity to renowned schools is “a major selling point” (Chin & Foong, 2006, p. 120). Chin & Foong (2006) explained families with children prefer to buy houses considering accessibility to renowned schools in terms of travel time and distance to the schools. Housing cost increases with more accessibility to primary and secondary schools in Singapore (Chin & Foong, 2006). Also, a study conducted by Downes & Zabel (2002) explained that in Chicago, housing price increases with proximity to quality schools with higher scores in the test results. In the study of buying behavior for apartments, N. Wu & Zhao (2015) stated that there is a high requirement for apartments near schools in Dalian, China.

Housing price, finance, household income and urban facilities

As explained by N. Wu & Zhao (2015) the ratio of the price of a house and monthly income of the home buyer, proximity to the city center, proximity to a subway station and proximity to school indicate housing affordability. Housing affordability indicated by the ratio of housing price and monthly income of the home buyer is the most important factor for housing choices in Dalian, China (N. Wu & Zhao, 2015). House buying tendency decreases with the increased ratio of housing price and monthly income of home buyers (N. Wu & Zhao, 2015). Azmi et al. (2020) found that house price is the first factor that home buyers consider in Malaysia. Zainon et al. (2017) stated that for the middle-income group in the Klang Valley area, Malaysia, the affordable cost of a house is the key factor of housing preference. Whereas, in Saudi Arabia, low-income groups prefer smaller sizes of houses for lesser costs (Opoku & Abdul-Muhmin, 2010). In the city of Shenzhen, China, housing prices are influenced by the proximity to urban facilities (J. Wu et al., 2015). Distance to the central business district followed by proximity to urban green spaces, schools, arterial roads and subways are the important factors influencing the housing prices (J. Wu et al., 2015). Yan & Zhang (2006) found in Xihu district of Hangzhou, China, that size of the house is the important factor that influences house price, in addition to that distance to the city center, clean and pollution-free locality, quality schools, commercial areas, banks, healthcare facilities in the neighborhood are also affecting housing prices. Also, another research in the Changjian Delta Region of China explained the same that the area of the house is the most important factor in terms of housing price (Xiaoyu et al., 2007). Bai et al. (2020) found in the dense city of China such as Hong Kong that housing prices are mainly affected by “Median Household income” (p. 16), convenience to Central Business District and convenience to Metro station. Lopez & Paredes (2018) studied the demand for housing attributes considering the flexibility in housing price and income of households in Chile, Latin America. Demand for housing attributes depends on the income of the households (Lopez & Paredes, 2018). Lopez & Paredes (2018) found that depending upon the household income, “housing quality (quality of walls, floors, roof)” (p. 25) and “housing features (water heater, washer, refrigerator, landline and computer)” (p. 25) are “luxury goods” (p. 24). Whereas, location of the house and the size of the house are the basic housing attributes demand (Lopez & Paredes, 2018). Haddad et al. (2011) explained that housing price along with popularity, reliability and status of the projects are factors of “marketing construct” (p. 236) that people consider for buying apartments in Jordan. As per the study conducted in Sidoarjo suburban area, Indonesia, Pudjiwidyastuti et al., (2016)

stated that the house price payment method is also an important housing preference. In the Central Business District of Santiago, Chile, people prefer to pay house prices based on the size of the house, clean neighborhood and not based on the facilities such as gym and swimming pool (Torres et al., 2013). Wong (2002) carried out a study in Singapore, which pointed that ultimately in the process of housing decision-making, the primary thought of home buyers is to get “the best value for money” (p. 230-231).

Proximity to Urban Green spaces like a public park

J. Wu et al. (2015) studied the effect of proximity to green spaces in Shenzhen, China, on housing prices using the hedonic pricing method. The influence of urban green spaces on housing prices is significant for houses located within a radius of 1.73 km from public parks in Shenzhen (J. Wu et al., 2015). Housing prices can be high within the influence zone of area 412.14 km² around urban green spaces and hence, consideration of proximity to public parks is important for home buyers, housing developers and government in Shenzhen (J. Wu et al., 2015). However, Fierro et al. (2009) stated an unexpected result from the survey carried out in Ciudad Juarez, Mexico, that parks in the neighborhood are in fact reducing the housing cost. Whereas, Melichar & Kaprová, (2013) found that housing costs in Prague, are mainly dependent on both distance to green spaces and area of green spaces.

Quality of housing

Lopez & Paredes (2018) stated that people consider the quality of a house as one of the “luxury goods” (p. 24). A good match between the architectural aspects of the house and the personal needs of the home buyer represents the quality of the house (Zavei & Jusan, 2012). Rahadi et al. (2012) found from the literature review that in Jakarta Metropolitan Region, Indonesia, people buy homes considering community living, security and reputation. Whereas, property developers recommend that the rate of the residential product depends on its design, convenience, services and brand value (Rahadi et al., 2012). Torbica & Stroh (2001) proposed a statistical regression equation to understand the home buyer’s fulfillment considering house design, house quality and services. Their study concluded that home buyers’ satisfaction in Florida, United States, is mainly based on the services but builders are not providing services appealing to the home buyers (Torbica & Stroh, 2001). Azmi et al. (2020) found that people in Malaysia, prefer housing projects with good maintenance and elevator facilities and housing units of area 1000 to 1500 sq. ft. with

three bedrooms and two toilets. Haddad et al. (2011) stated that home buyers in Jordan, consider the aesthetical quality of apartments in terms of their design, views from the apartment, entrance door, interior beautification. Opoku & Abdul-Muhmin (2010) found that in Saudi Arabia, low-income groups prefer smaller sizes of houses with living space and aesthetical aspects. Yang & Fu (2019) found in China that “housing conditions” (p. 1-14) in terms of “reinforced concrete structure” (p. 6), age of the building, apartment or detached house, number of stories in the building, “barrier-free passageways” (P. 6), reduced number of steps, “number of rooms” (p. 6), toilets, baths, electricity and water facilities, etc. affect “health status” (p. 1-14) of old age residents. Hence, “housing adaptation” (p.1-14) considering the health of elders is important (Yang & Fu, 2019). In the Changjian Delta Region of China, the design of rooms, natural light, ventilation, floor to ceiling heights are the important factors related quality of housing (Xiaoyu et al., 2007). A research was conducted by Chiwuzie et al. (2020) in Ede, Nigeria focusing on preferences for house characteristics and sizes of spaces in the house. Their study found that now a days people are more concerned about larger areas of living spaces, bathrooms, bedrooms and kitchens (Chiwuzie et al., 2020). Also, “perimeter fence” and “fully tiled floor” (p. 53) are important housing characteristics in terms of the overall lifestyle standard of residents (Chiwuzie et al., 2020). Spetic et al. (2005) studied “healthy homes” (p. 23) preferences in terms of indoor environment quality. They found that in Canada, people prefer energy-efficient materials, daylight, sound insulation and non-polluting substances in the house (Spetic et al., 2005). Krisnaputri & Salim (2021) found in Surabaya city of Indonesia, that due to limited land availability demand for apartment housing typology is increasing. Architecture, house layout, materials and decoration, air quality are important aesthetic factors influencing house buying decision in Wuhan, China (Zeng, 2013). In Ciudad Juarez, Mexico, housing prices are mainly influenced by the number of bathrooms, area of property and area of the floor (Fierro et al., 2009). In Kuala Lumpur, Malaysia, the survey among first-time home buyers revealed that the quality of housing units, as well as quality and safety of the neighborhood are important housing preferences (Teck Hong Tan, 2012). Dauda (2019) stated in Abuja, Nigeria, residents consider residential quality in terms of housing characteristics such as attached toilets, spacious kitchen and living area. Further Abuja residents also consider the quality of neighborhood in terms of its safety, landscaped and clean environment (Dauda, 2019). In Greenville County, South Carolina, USA, Hiebert & Allen (2019) found that people are willing to pay for residential environment quality in terms of forest views, distance to a forest and agriculture. Lee (2005) conducted survey

among households of private apartments in Charlotte, North Carolina and found that residents preferred facilities of washers and dryers, walk-in-wardrobe, outdoor spaces, more ceiling height, availability of high-speed internet, parking space for guests and limited access to the apartment building. Also, depending on lifestyles of residents, they prefer variety of interior design specifications in the housing units (Lee, 2005).

Economic status and cultural background

Leung & Tsang (2011) used a semi-parametric hedonic pricing model to understand people's housing preferences related economic status of residents in the neighborhood in Hong Kong. Leung & Tsang (2011) concluded that people do not prefer to buy houses in the neighborhood with the disparity in terms of the economic status of the residents. As per the study conducted in the Changjian Delta Region of China, Xiaoyu et al. (2007) explained that accessibility to friends and relatives, social activities are important cultural considerations for housing choices. Jabareen (2005) stated that in Gaza, Palestine, "kinship relations and attitudes towards women" (p.143) are the most important cultural aspects that affect housing preferences. In Jordan, people consider the lifestyle of neighbors while buying apartments (Haddad et al., 2011).

Home ownership

Elsinga & Hoekstra (2005) studied the home ownership preferences of people in eight European countries. They observed in seven European countries that people prefer home ownership in terms of achieving more housing satisfaction rather than living in rented houses (Elsinga & Hoekstra, 2005). Rohe & Stewart (2010) stated that neighborhood stability depends on home ownership. Home ownership represents a good economic status of a person (Rohe & Stewart, 1996). People believe that home ownership is important for ensuring a good environment for the upbringing of children, for a safe and large space for family and freedom of modifications in the house (Drew, 2014). Also, race, gender, education level, age and marital status of people are important factors for home ownership decisions (Hood, 1999). Mentaza Khan et al. (2017) conducted research in Malaysian cities Kuala Lumpur, Penang and Johor Bahru, to understand the housing preferences of home buyers who are buying their first homes. Mentaza Khan et al. (2017) analyzed that "economy, neighborhood, structure and location" (p.5) are the important considerations for first-time home buyers (Liu & Liu, 2011).

Age of a home buyer and other demographic factors

McKee (2012) suggested that the housing policy by UK government needs to be inclusive of home ownership opportunities for people from the age group of 18 to 30 years as they face many financial issues while buying houses. Whereas, Hui et al. (2014) stated that the housing policy by Hong Kong government should focus on housing preferences of the elderly population from the age in place perspective. Jong et al. (2012) also stated that the Dutch older population from the age group 55 years and above prefer to “stay put” (p. 1-26) rather than changing houses in Groningen, the Netherlands. Costa-Font et al. (2009) found the same result from the survey among the old-age Spanish population. Even a survey report by AARP (2018) stated that the adult US population mainly from age group above 50, wish to stay in their current homes and communities as they age. However, aging people do consider alterations in the house as per old age requirements (AARP, 2018). Elderly people prefer apartment housing units with elevator service and all the rooms in the house on the same floor (Jong et al., 2012). Considering the preferences for the residential environment, elderly people prefer to live in a neighborhood that is well within the city with close proximity to their everyday needs, health care and transportation facilities (Jong et al., 2012). Considering the social aspect, elderly people prefer living in a community that includes people from different age groups and family sizes (Jong et al., 2012). Gibler et al. (2009) conducted research in Alicante, Spain, on retirement housing preferences of the population from age group 50 years and above who were in their retirement phase of life. Gibler et al. (2009) found that old age retired population prefer retirement housing with “on-site support service” (p. 12) such as assistance for health care, house maintenance, any emergency situations and safety. Mentaza Khan et al. (2017) conducted research in Malaysian cities such as Kuala Lumpur, Penang and Johor Bahru to understand the housing preferences of home buyers who are buying their first homes. The first-time home buyer can be from the age group 24 to 34 years (Mentaza Khan et al., 2017). Mentaza Khan et al. (2017) analyzed that “economy, neighborhood, structure and location” (p.5) are the important considerations for first-time home buyers. In addition to this first-time home buyers also consider green homes, security in the neighborhood, proximity to market areas, place of work and urban facilities (Tech Hong Tan & Cheah, 2012). Similarly in Malaysia home buyers from “Generation – Y (born 1980-1997)” (p. 2) are more concerned about age of the house, green home concepts, safe and well maintained neighborhood, proximity to place of work and restaurants in the surroundings (Kam et al., 2018). Hence, they prefer to buy houses in the central part of the cities rather than buying houses in the suburban areas

(Kam et al., 2018). Another research by Ismail & Shaari (2019) explained that in Malaysia, “Baby Boomers (born 1946-1961)” (p. 1) and “Generation X (born 1962-1976)” (p. 1) are more concerned about “neighborhood” (p. 5) as they prefer to live in the familiar area. “Generation Y (born 1977-1991)” (p. 1) and “Generation Z (born after 1992)” (p. 1) are more concerned about the design of the house (Ismail & Shaari, 2019). Also, females consider “House” (p. 5) whereas males consider “location” (p. 5) as the primary factor for housing preferences (Ismail & Shaari, 2019). Choong & Cham (2014) found that in Malaysia, elderly residents prefer the larger size of the houses so that they can live with their family members. Other than this Choong & Cham (2014) stated housing price, low rise houses, “wide doorways” (p. 1-11), lift facility, light, “alarm button” (p. 1-11), provision of ramp and handrails are important housing attributes. Also, elders prefer a low-density residential environment with “security” (p. 1-11), easy access to job place, facilities such as “jogging track” (p. 1-11), parks, “swimming Pool” (p. 1-11), “tennis/badminton court” (p. 1-11), and public transportation such as “monorail” (Choong & Cham, 2014, p. 1-11). Weidmann & Kelly (2011) studied housing preferences of people in Australia, from age groups 18-44 years, 45-64 years and above 65 years considering “demographic segments” (p. 1) such as “Lone person, Couples without children, Couples with children and Single parents” (p. 1). Single person household is more concerned about the location of the house in terms of safety and proximity to important facilities in the city (Weidmann & Kelly, 2011). Families with children are concerned about housing attributes such as bedrooms, living areas, bathrooms, parking spaces, etc. (Weidmann & Kelly, 2011). Mulliner et al. (2020) conducted study in UK focusing on housing preferences considering health of people from age group 55 years above. People from elder age group prefer detached houses (Mulliner et al., 2020). Further, Mulliner et al. (2020) explained that considering the health requirements, older people prefer well maintained house, non-slippery flooring in the house and in the bathrooms, “handrails” (p. 11), “wider corridors” (p. 11), lift service, temperature control system, “energy efficient house” (p.11), natural light, natural air, views of greenery from the house, personal garden, safe, clean and walkable neighborhood, convenience to relatives and friends and convenience to public facilities. Housing preferences study in Poznan, Poland, shows that throughout all phases of the life cycle of home buyers, important housing preferences are condition of house, condition of building, heating facilities and light quality in the rooms (Palicki, 2020). Considering the gender-differences, women are more likely to prefer houses on the basis of

social aspects, lifestyle, personal and family requirements (Shawki, 2007). Particularly old age women consider their emotional connection with the house (Shawki, 2007).

Change of residences for better housing choices

F. Wu (2004a) examined housing consumption with reference to manners of relocation in Shanghai, China. Relocation of people is mainly associated with the availability of employment facilities, shift from outer to inner areas, family income, level of education and space of earlier housing (F. Wu, 2004a). Because of relocation, changes could be experienced by the residents in terms of house ownership, quality and structure of houses (F. Wu, 2004b). Burnley et al. (1997) studied in Sydney Metropolitan area, that people shift to the outer areas from the inner areas of the cities to seek a better environment, housing quality and affordable housing ownership. But these shifts to outer areas have disadvantages such as people have to experience more travel time to their workplaces and they can not keep in touch with their friends and relatives very often (Burnley et al., 1997). Also, young and first-time home buyers may face housing affordability issues in the outer areas of the city (Burnley et al., 1997).

Walkability and Density of Residential Neighborhood

Myers & Gearin (2001) predicted housing requirements between the year 2000 to the year 2010 in the United States. Their study stated that during the years 2000-2010, people from the age group forty-five years and above could prefer to buy homes in dense and pedestrian-friendly residential areas (Myers & Gearin, 2001). Another research in Taipei, Taiwan, conducted by Lin & Jen (2009) found that households with children and old age people prefer to buy houses in “transit-oriented development” (p. 105-125) for a densely developed area where they can get all facilities nearby. Both a pedestrian-friendly neighborhood and the cost of the house, are equally important as they affect housing choices equally (Olitsky et al., 2017). Olitsky et al. (2017) found in the neighborhoods of Israel, that people are more likely to prefer “a shopping strip” (p. 1007) within walkable distance than the shopping mall. Whereas education facilities are more important than health care facilities in terms of walkable distance (Olitsky et al., 2017).

Flexibility to do modifications in the house

Omar et al. (2012) conducted research in Malaysia, to understand the tendency of home buyers to do physical modifications in their houses. Omar et al. (2012) investigated

that after buying houses from the private housing developers home buyers tend to modify them as per their requirements. These modifications are in terms of changing the esthetical features of the house and in terms of changing some structural elements of the house such as roofs, porches and walls (Omar et al., 2012). Thus, home buyers prefer to make the appearance of their homes different than others and to make it more personalized (Omar et al., 2012). Hence, Omar et al. (2012) suggested that private housing developers need to consider the requirement of home buyers to have the flexibility to do the modifications in the houses.

Innovative housing development

Liu & Liu (2011) explained that now in Xi'an, China, home buyers not just compare the housing cost but also consider the “brand” (p.1611) value of the developer who can provide improved quality houses with innovative ideas. As Liu & Liu (2011) mentioned that for the advanced and easy life of home buyers, developers provide housing units with new technologies such as “closed-circuit TV” (p. 1611), “Identity card technology” (p.1611), etc. Also, developers focus on providing house plans which can facilitate quiet spaces, natural light and air in the houses (Liu & Liu, 2011). Developers include landscape elements and other facilities like health care, transportation, education, shopping, etc. in the housing projects (Liu & Liu, 2011). Liu & Liu (2011) stated that “ecological” (p.1612) residential development is one of the very new trends that developers consider. Even in Malaysia, green homes are more preferred by people over conventional houses (Jusoh, 2015). First-time home buyers in Malaysia especially those from younger generations are more likely to prefer green homes (Teck Hong Tan, 2012) (Tech Hong Tan & Cheah, 2012) (Kam et al., 2018). Natural air circulation in the house is the most preferred attribute of green homes (Jusoh, 2015). The study conducted in Green Townships in Malaysia shows that in terms of sustainability, well-connected neighborhoods with convenience and good quality environments are important for residents (Teck Hong Tan, 2016).

Location and proximity to urban amenities

Lopez & Paredes (2018) stated that location is one of the basic housing attributes that home buyers consider. Sinniah et al. (2016) studied in Iskandar, Malaysia Development Region, that people select housing locations based on cultural and religious aspects for example places of worship. Another study in Malaysia stated that people prefer housing located near schools and health care facilities (Azmi et al., 2020). Whereas, in Kuala

Lumpur, Malaysia, proximity to job places, schools, shopping and recreational areas are important housing location preferences for first-time home buyers (Teck Hong Tan, 2012). Also, Thanaraju et al. (2019) found that in Kuala Lumpur, Malaysia, location is the important housing preference in terms of proximity to the place of work and schools. Żróbek et al. (2015) explained that for selecting housing locations in Poland, people consider housing cost, attractive views of the surroundings, safety and less noise pollution in the neighborhood. Schirmer et al., (2014) suggested that factors such as proximity to schools, market areas, transportation facilities, location of earlier residence are important for the measurement of residential location preferences. Report on housing preferences study in Perth and Peel, by Western Australia, Department of Housing and Department of Planning (2013), stated that location of the house is the most important for people considering the proximity to schools, workplaces, restaurants, shops, healthcare facilities, transportation, and availability of internet facilities. In Jordan, for buying apartments people consider location and proximity to shopping areas (Haddad et al., 2011). Whereas, in the suburban area of Sidoarjo, Indonesia, house location benefits, public and transportation facilities are important housing preferences (Pudjiwidyastuti et al., 2016). In Hong Kong, China, people prefer housing locations away from the cemetery and close to the central business district, metro station and bus stop (Bai et al., 2020). Hurtubia et al. (2010) explained that location choices are dependent on family income, family size, age, sex, marital status, number of earning people in the family, education level, resident's tenure, car ownership, travel pass for public transportation. Considering the location of Central Business District in Santiago, Chile, Torres et al. (2013) found proximity to "commercial services" (p. 69) is more important than proximity to "Cultural services - heritage buildings, museums, concert halls and public libraries" (p. 69). Kauko, (2007) conducted the survey in the inner city of Budapest, which shows that people prefer housing location over the quality of the house. Mainly housing location is important for first-time home buyers (Kauko, 2007). Kauko, (2007) found people prefer housing locations with urban characteristics and no racial concentration. In Surabaya, Indonesia, concerns of flood situations, convenience in terms of nearness to shopping, workplaces, schools, tourism, healthcare facilities and transportation facilities, road connectivity, water and electricity supply, land cost, taxes, mixed land use, zoning and planning regulations are important factors for deciding apartment housing locations (Krisnaputri & Salim, 2021). As per the study of the housing market of Wuhan, China, the home buying decision is mainly influenced by the location of the house in terms of proximity to educational facilities,

healthcare facilities, sports facilities, transportation, shopping, jobs, eateries, libraries, community services, religious centers and other public facilities (Zeng, 2013). In Taipei, Taiwan, Chiang et al. (2015) found that in low-income neighborhoods, residents prefer proximity to convenience stores to go shopping on the way home. Whereas, residents in high-income neighborhoods can travel more distance for convenience stores (Chiang et al., 2015). The study performed by Skifter Andersen (2011) in Denmark, shows that preferences for housing location and surroundings depend on the phases of lifecycle. Young unmarried residents prefer urban lifestyle and so choose to stay close to city and transportation facilities (Skifter Andersen, 2011). Married couples with children prefer housing locations based on requirements for good upbringing of children such as socially quite neighborhoods, near to schools, day care facilities and workplaces (Skifter Andersen, 2011). Whereas, elderly people prefer housing locations in the familiar neighborhoods, where they have grown up (Skifter Andersen, 2011). Jun (2013) explained that in Seoul, South Korea, people from middle income group and higher income group prefer housing in suburban areas. Booi & Boterman (2020) found that in Amsterdam, people from middle-income and lower-income group who are highly educated and people who have older children in the family prefer to stay in the city. Whereas, families with young children are more likely to prefer residential locations in suburbanized areas of Amsterdam (Booi & Boterman, 2020). Dauda (2019) found that in Abuja, Nigeria, housing choices are based on proximity to shopping areas, a central business district and schools. Jansen (2020) stated that Dutch households prefer central business districts for amenities and a lively residential environment. Those who want peaceful surroundings prefer residential areas along the edges of the city (Jansen, 2020). The Residential environment in small municipalities is preferred to have social connections and rural areas are preferred for liberty and peace (Jansen, 2020). Lee (2005) stated that in Charlotte, North Carolina, households who chose apartment locations in downtown areas have considered security aspects such as gated entrance, parking garages and limited access to the apartment building. Whereas, households who chose apartment locations in suburban areas have considered parking space in the outdoors in front of the building and walking trails (Lee, 2005).

Public transportation

Lin & Jen (2009) studied characteristics of families residing in “transit-oriented development” (p. 105-125) around Danshui metro line in Taipei, Taiwan. They found that factors such as family income, family size and requirement for the area of the house don’t

show any positive relation with “transit-oriented development”(Lin & Jen, 2009, p. 105-125). But families with children and old age people prefer to reside in “transit-oriented development” (p. 105-125) for a dense and mixed development of the residential area with commercial and other public amenities. Smith & Olaru (2011) conducted a survey along Mandurah Railway Corridor in Perth, Western Australia, which revealed that housing prices are influenced by proximity to transit hubs. Whereas, TANAKA et al. (2013) found that, in Bangkok, Thailand, the use of railway transportation is dependent on the transportation cost and travel time to the workplaces of earning members in the family. Thus, low-income, middle-income and childbearing households are more likely to use railway transportation and they prefer housing locations along railway corridors in Bangkok (TANAKA et al., 2013). A study conducted in Szczecin, Poland, explained that the analysis of positive and negative impacts of urban infrastructure reformation, for example, up-gradation of main streets characteristics and street furniture, on the real estate market is important for effective future residential development (Forys, 2020).

Consumer’s behavior in the housing market

Hei & Dastane (2017) conducted research in Malaysia, to understand important factors that customers consider while buying a property for residential use. Hei & Dastane (2017) found that people buy residential property considering its location in terms of proximity to urban facilities, place of work and commercial areas. Choice of residential property location is not influenced by the proximity to the houses of relatives of customers (Hei & Dastane, 2017). Other important factors for customers are interior and exterior attributes of the house such as design, number of rooms, kitchen, etc. (Hei & Dastane, 2017) (Sbakhi et al., 2018). Loan accessibility is important for property buyers from a low-income group and a medium-income group. Quality of environment and security of neighborhood also show major influence on the property buying decision of people (Hei & Dastane, 2017). Whereas, age, education, family size, gender, earnings are less influencing factors for property buyers (Hei & Dastane, 2017). Also, in Malaysian housing market, location is the most preferred factor by the consumers for the purchase of serviced apartments then it is followed by housing cost, proximity to amenities and built-up area of the house (Deborah Ng Si Jia and Dr. Kamalahasan Achu, 2015). In Kota Kinabalu, Sabah, Malaysia, financial aspects, distance to urban facilities, superstitious beliefs related to house numbers, noise-free and pollution-free residential environment, house characteristics show positive relation to consumer’s house purchase behavior (Chia et al., 2016). Sometimes, home buyers buy

houses for investment purposes (Sean & Hong, 2014). In such cases, they consider finance, size and number of rooms in the house, location of the house in terms of proximity to schools, workplaces, commercial areas and urban facilities (Sean & Hong, 2014). As per the housing purchase behavior survey carried out in Kyrgyzstan, buying a home is mainly associated with the emotions of home buyers as it is important to own a house for the good future of their children and investment (Kaynak et al., 2018). In Kyrgyzstan, the house buying decision is influenced by economic attributes like loan interest, house price, resale value and property taxes (Kaynak et al., 2018). Also, Kyrgyz home buyers consider residential environment attributes such as nearby schools, workplaces, parks, bus stops, safety, status and social structure of the neighborhood, services like garbage collection, street lights and cleaning of streets (Kaynak et al., 2018). Further, home buyers consider house attributes such as the age of the house, exterior material and esthetics, number of rooms in the house, front yard, landscape and insulation of roof (Kaynak et al., 2018). Nghia (2017) conducted a study to understand factors that influence affordable housing purchase from a home buyer's perspective in Southern Vietnam. Marketing aspects, which include the brand of the builder, Fengshui of housing unit, skills of sales department showed significant influence on affordable housing purchase decision of home buyers. Other than this finance, residential environment in terms of security, noise pollution, surrounding views, house characteristics like the quality of construction, size and typology of housing are the important affordable housing preferences (Nghia, 2017). Also, legal procedures related to affordable housing purchases are significant for home buyers (Nghia, 2017). Kurniawan et al. (2020) found that in Indonesia, home buyers from millennial generation take their housing purchase decisions based on housing unit characteristics, locational and economic aspects.

2.1.2 Housing preferences studies in Indian cities

Gothi & Singh (2015) conducted an opinion survey, amongst the experts from different domains related to housing development in India to understand the housing demand based on housing attributes and neighborhood attributes. Whereas, Ghumare et al. (2020) conducted the online survey in Maharashtra, Madhya Pradesh, Rajasthan and Gujrat amongst town planners, officials from local planning authorities, housing developers and housing consultants who work for affordable housing development, to study housing attributes that influence affordable housing purchase decisions. Ghumare et al. (2020) stated that for buying affordable houses, family income, down payment, tenure and interest

rate of housing loans are the most important aspects that influence home buyers from an economically weaker section and a low-income group. Gothi & Singh (2015) found that electricity and water facilities are the most important house attributes, followed by kitchen, bedrooms and toilets. Safety of neighborhood, availability and accessibility of facilities such as job place, shopping areas, schools are important neighborhood attributes. De & Vupru (2021) observed in one of the small Indian towns, Dimapur in Nagaland, that housing attributes such as number of stories, quality of flooring, water facility, age of the building, carpet area, materials used for exterior walls and neighborhood aspects such as condition of access roads, convenience to facilities and education status of neighbors show positive association with housing costs. On the basis of study conducted in Delhi, Gurgaon, Ghaziabad and Noida, Kumar Gupta & Malhotra (2016) found that Indian home buyers are mainly concerned with the household's financial capabilities to pay housing loan installments. Indian home buyers consider household income, family structure and existing housing conditions (Kumar Gupta & Malhotra, 2016). In Delhi and National Capital Region (NCR), home buyers prefer low-rise housing and 3BHK (Bedroom-Hall-Kitchen) housing typology (Kumar Gupta & Malhotra, 2016). Manivannan & Joseph (2017) studied consumers' purchasing behavior for flats in the residential real estate market of Tamil Nadu. K. T. Manivannan & Joseph (2017) stated that buying behavior for flats by the majority of home buyers is at a moderate level. Flats provided by housing developers at affordable prices and in the hygienic residential environment can increase buying behavior of consumers (K. T. Manivannan & Joseph, 2017). In Chennai, Coimbatore, Madurai, Tiruchirappalli, Thanjavur and Dindigul, P. Manivannan & Somasundaram, (2014) observed that consumer's decision to purchase a flat is mainly influenced by water and drainage facilities, finance, the exterior appearance of flats, interior of flats and safety of residential environment (P. Manivannan & Somasundaram, 2014). Patil et al. (2010) conducted a study in Nagpur city to understand residential location preferences of people from income group 10,000 to 50,000 INR per month. Patil et al. (2010) found that residential location decisions by people from the Lower Middle-Income Group are influenced by age of the head of the family and the number of rooms in the house. Whereas, people from the Higher Middle-Income group are more concerned about the distance to a public park, residential environment and age of the head of the family (Patil et al. 2010). But in comparison to the Higher Middle-Income Group, the residential location decision of people from Lower Middle- Income Group is not associated with house type and ownership type (Patil et al., 2010). Misra et al. (2013) carried out a study in National Capital Region,

Delhi, to understand consumers' viewpoints and behavior for purchasing apartments in Gurgaon, Noida and Greater Noida. Misra et al., (2013) stated that consumers prefer Noida and Greater Noida for “Business opportunities” (p. 56-68). Whereas, consumers require more safety and health care facilities in residential areas of Greater Noida and better transportation facilities in both Noida and Greater Noida (Misra et al., 2013, p. 56-68). Thus, Misra et al. (2013) suggest housing developers to develop housing projects considering perceptions of consumers in National Capital Region, Delhi. Another study on house purchase behavior of consumer was conducted in Chennai, by Sridevi & Saranya (2018). In Chennai, Sridevi & Saranya (2018) found that house purchase behavior of consumers is mainly influenced by the family income, opinions of family members, suggestions of friends and social status. Petkar & Macwan (2013) pointed out the need to understand residential location preferences of residents while formulating city development plans. Narkhede & Telang (2011) found that housing location preferences within municipal corporation limit of Pune city are influenced by home buyer's budget and locations where employment opportunities, infrastructure and amenities are available.

2.2 Statistical Methods for the measurement of housing preferences

Fundamental inspirations help home buyers to derive housing preferences (Zinas & Jusan, 2012). The methodological approach can be decided upon the purpose of the study of housing preferences such as understanding the process to derive housing preferences, finding out the most important housing preferences and analyzing the relation between the variables of housing preferences (Sharma, 2021). As discussed in the earlier sections of the literature review, many factors affect housing preferences. Different statistical methods can be used to study these factors as follows:

2.2.1 Means-End Chain Theory

Means-End Chain (MEC) model was introduced by Gutman (1982), to explain how the service or product (Means) choice can support to attain expected valued state (End). Product characteristics, direct or indirect consequences of product consumption and valued end-state are the main variables of the basic structure of MEC model (Gutman, 1982). Product characteristics, direct or indirect consequences of product consumption and valued end-state are the main variables of the basic structure of MEC model (Gutman, 1982). Few researchers have adopted MEC model to study housing preferences. Henny Coolen & Hoekstra (2001) used MEC for relating microlevel motivational factors like goals and

values as housing characteristics preferences. Henny Coolen & Hoekstra, (2001) conceptually explained an easy example of a means-end chain model related to housing as shown in Figure 2.1.

Henny Coolen & Hoekstra (2001) conducted a pilot project to understand the viability of Means-end Chain method for the study of housing preferences. They have examined the means-end chains based on the data produced by laddering interviews related to housing attributes. They faced the problem that the housing preferences of people were very diverse and that made the laddering method complex.

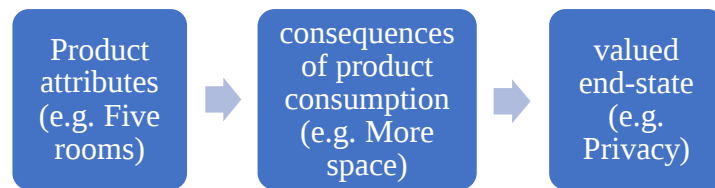


Figure 2.1 Conceptual structure of MEC model
(Gutman, 1982) (Zinas & Jusan, 2012) (Henny Coolen
& Hoekstra, 2001, p. 291)

2.2.2 Modelling Approaches

Timmermans et al. (1994) have reviewed the cross-sectional model and made a difference between revealed and stated preference models. Revealed preference models are related to real housing selections of home buyers and stated preference models are related to hypothetical housing selections (Timmermans et al., 1994). Further models are also separated into algebraic and non-algebraic models includes qualitative modelling approaches (Timmermans et al., 1994). Multinomial logit (MNL) model and a nested logit model can be used as revealed preference models (Timmermans et al., 1994). Stated models of housing preferences and housing choice were further separated into algebraic models like compositional model and conjoint models and non-algebraic models which include qualitative modelling approaches (Timmermans et al., 1994). Timmermans et al. (1994) concluded that revealed models are not right for understanding the structure of housing preferences but yet they can perform better because of their predictive abilities. Application of compositional model is easy but it is less dependable than conjoint model for their validity and predictive ability (Timmermans et al., 1994, p. 224). Conjoint models are useful for emerging advanced models but it has a limitation because it is derived by “experimental design data” (Timmermans et al., 1994, p. 224). But overall modelling approaches for the study of housing preferences and housing choices are flexible

(Timmermans et al., 1994). Earnhart (2001) explored three analytical approaches discrete choice analysis for revealed preference data, choice-based conjoint analysis for stated preference data and jointed estimation of combined revealed and stated data. The blend of revealed and stated methods and data advances the strengths by lessening the disadvantages of separate methods and it can help for the finding the rare levels of aspects of housing preferences (Earnhart, 2001). Wang & Li (2004) used the stated preference modelling approach to study the joint choice of dwelling and neighborhood in Beijing, China. Wang

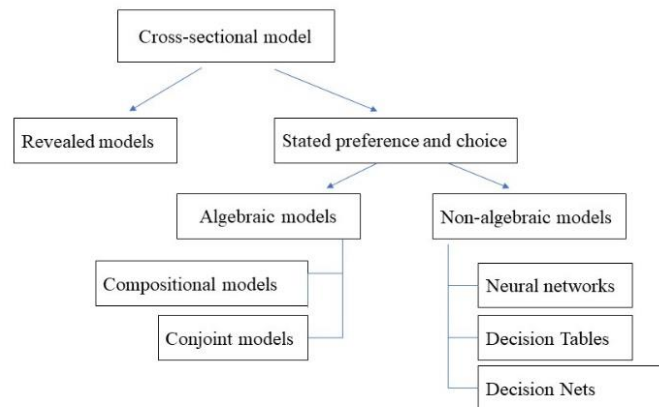


Figure 2.2 Brief review of Modelling Approaches

(Timmermans et al., 1994) (Orzechowski, 2004)

& Li (2004) employed nested logit model to examine the joint choice of housing characteristics such as house type, size, plan, interior design and neighborhood variables such as approachability, public services, convenience, environmental value, exterior esthetics, socio-economic structure of the neighborhood. In Tampere, Finland, Hasanzadeh et al. (2019) used a fuzzy modelling approach and found that among the urban residents there was a significant difference between their stated and revealed housing preferences.

2.2.3 Hedonic housing Price

Freeman (1979, p.193) defined the hedonic Pricing method (HPM) as the indirect prices of the attributes which distinguish closely related products in a product class. So, housing is a heterogeneous product that can be differentiated by features like the number of rooms, size of the lot, location, neighborhood facilities and quality (Freeman, 1979) (Owusu-Ansah, 2013). The relationship between an outcome variable (y) and predictor variable (x) can be represented by the curve of hedonic regression. The regression equation is shown as follows (Owusu-Ansah, 2013)

$$y_i = f(x_i) + \varepsilon_i \quad (1)$$

where,

y = Outcome variable/Dependent variable

x = Predictor variable/ Independent variable

ε_i = Observation error

$f(.)$ = Regression function

Numerous housing characteristics contribute to the house cost and it can be shown as the following equation (J. Wu et al., 2015, p. 05014023-2).

$$P = y(a_1x_1, a_2x_2, a_3x_3, \dots, a_nx_n) + u_n \quad (2)$$

where,

P = Price

x_1, x_2 , and x_3 = Housing characteristics

a_n = Estimated coefficient,

u_n = Error term.

Chin & Foong (2006) have used hedonic pricing model to study the association between housing costs and proximity to school from the houses in Singapore. J. Wu et al. (2015)

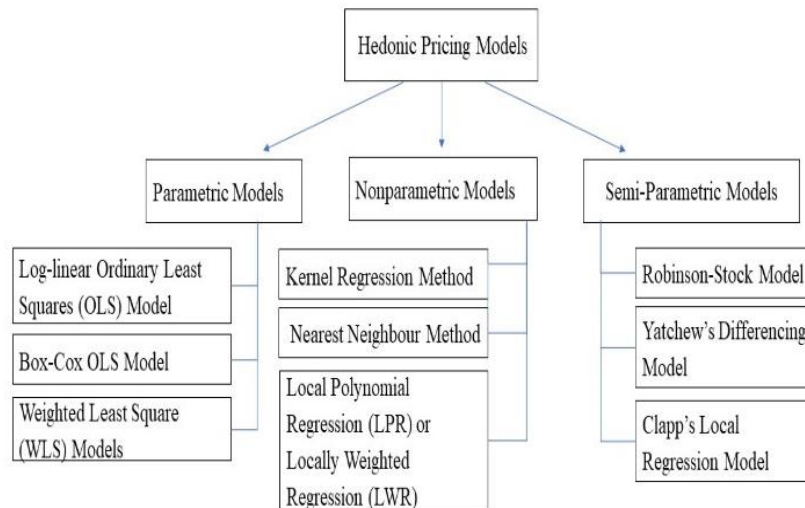


Figure 2.3 Brief review of Hedonic Pricing Model

(Owusu-Ansah, 2013)

have studied the effect of green spaces like parks within Shenzhen on housing prices by using HPM. J. Wu et al. (2015) have applied HPM to determine people's housing choices considering lot sizes. Leung & Tsang (2011) collected housing transaction data between 2005 and 2006 for about 90,000 housing units in Hong Kong and applied a semi-parametric

hedonic pricing model to understand if home owners prefer to live in an area with equal distribution of income.

2.2.4 Logistic regression

Logistic regression is appropriate for hypothesis testing of relationships between the categorical dependent variable (outcome variable) and one or more continuous or categorical independent variables (predictor variables) (Peng et al., 2002). While entering data into statistical analysis software continuous predictors can be entered as continuous values and categorical predictors can be entered as dummy codes (0 and 1) (Peng et al., 2002). In the study of residential relocation and changing housing consumption in Shanghai, F. Wu (2004) has analyzed variables like family income, education status, earlier house area, family size, etc. through logistic regression. Hood (1999) used logistic regression on the possibility of home ownership in 1966 to study the factors of home ownership. Hood (1999) tested the relationship between independent variables such as family income, race, gender, education, home ownership passed on by parents, age, marital status and family size with outcome variable as household ownership. N. Wu & Zhao (2015) formulated a logit model based on stated preference (SP) data in which housing costs, monthly expenditure, distance to the subway station, Travel time to the city center, a school near the apartment, gender were model variables and the possibility of the individual selecting apartment was the dependent variable. Logistic regression can be written as the following equation.

$$\text{Logit (Y)} = \text{natural logs (odds)} = \ln \left(\frac{\pi}{1-\pi} \right) = \alpha + \beta X \quad (3)$$

where,

Y = Dependent categorical variable

X = Independent categorical or continuous variable

$\ln$ = Natural Logarithm

π = Probability

β = Regression Coefficient

2.3 Summary of previous research

The first two sections of the ‘Literature Review’ chapter have discussed various housing preferences studies conducted across different parts of the world. In Asian countries mainly in China and Malaysia, researchers have carried out a wide range of housing preferences studies in recent decades. Even in other Asian countries such as India, Singapore, Indonesia, Taiwan, Thailand, Vietnam, Jordan, Saudi Arabia and Israel, researchers have conducted housing preferences studies in the last few years. Also, recently a researcher has conducted a housing preferences study in West African country, Nigeria. So, it can be observed that in the last two decades, researchers are showing up their keen interest in housing preferences studies in developing countries. Whereas, in developed countries such as USA, UK and other European countries, researchers have studied housing preferences mainly in terms of housing quality, neighborhood quality, home ownership, housing locations and housing prices. In many countries around the globe, researchers have extensively studied housing preferences for old age people and other age groups.

As India is one of the rapidly growing countries, researchers are conducting housing preferences studies in many important cities in India. In Indian cities such as Delhi, Ghaziabad, Noida and small towns like Dimapur in Nagaland state, researchers have studied housing preferences based on housing characteristics, economic factors and social factors. Whereas, in Greater Noida, Delhi National Capital Region, Gurgaon, Chennai, Coimbatore, Madurai, Tiruchirappalli, Thanjavur and Dindigul, researchers have focused on understanding the consumer’s behavior in the real estate market and they have studied housing preferences related to housing attributes, neighborhood attributes and financial concerns of home buyers. A similar study is carried out in the Tamil Nadu state of India. In Maharashtra state, housing location preferences are studied in Nagpur city and Pune city.

As discussed in the first section of this chapter so far researchers have mainly studied housing preferences related to housing cost and other financial aspects, housing characteristics, demographic factors, location and consumer’s behavior in the housing market. Comparatively, researchers have rarely studied housing preferences related to transportation facilities. The second section of this chapter has discussed a review of some of the statistical methods used in the previous research for measuring housing preferences.

The main purpose of reviewing existing research was to identify factors affecting a house buying decision. These identified factors from the previous studies are listed into six broad categories as follows:

2.3.1 List of identified factors of housing preferences from existing research:

1. Economy:

- Housing price
- Monthly expense per person
- Down payment & Financing
- House for investment
- The housing price to the quality and environment
- Transportation cost
- House size

2. Home Ownership:

- Age
- Marital status
- Education
- A phase of life cycle

3. Location:

- Distance from city center
- Proximity to schools, public transport, shopping areas, workplace

4. Change of residences:

- The relocation of households from the central areas to the urban periphery for bigger space and improved condition of housing
- Relocation due to work

5. Walkability and Density Residential Neighborhood:

- Mobility of neighborhood
- Auto orientated Neighborhoods
- Proximity to service store, school, etc.

6. Quality of housing:

- satisfaction with house design, house quality, and services.
- Proximity to public park

2.4 Pune Metropolitan Region (PMR)

The study area of this research is Pune Metropolitan Region (PMR). Pune Metropolitan Region (PMR) is developed around Pune city in Maharashtra State of India. Geographical location of PMR is 18°58'N, 73°50'E (north), 18°07'N, 74°01'E (south), 18°33'N, 73°10'E (east) and 18°28'N, 74°27' (west) (PMRDA, 2021). The total area of PMR is 6914.26 sq. km. (PMRDA, 2021). Jurisdiction of PMR consists of Pune Municipal Corporation (PMC), Pimpri-Chinchwad Municipal Corporation (PCMC), Maval Taluka, Mulashi Taluka, Haveli Taluka and parts of other Talukas such as Bhore, Daund, Shirur, Khed, Purandar and Velhe (PMRDA, 2021). Thus, PMR includes two Municipal Corporations, three Cantonment Boards, seven Municipal Councils, eight hundred and fourteen villages and thirteen census towns (PMRDA, Pune, 2020) (PMRDA, 2021). As per Census 2011, population of PMR is 73,21,367 (PMRDA, 2021).

“PMR is the largest Urban Agglomeration in Maharashtra” (PMRDA, 2021, p. 2). Due to the availability of employment opportunities, educational institutes, good climate, culture, nearness to Mumbai, IT Hubs, Business Hubs, Automobile Manufacturing Industries and other industrial developments, Pune Metropolitan Region is rapidly growing in terms of business and residential developments.

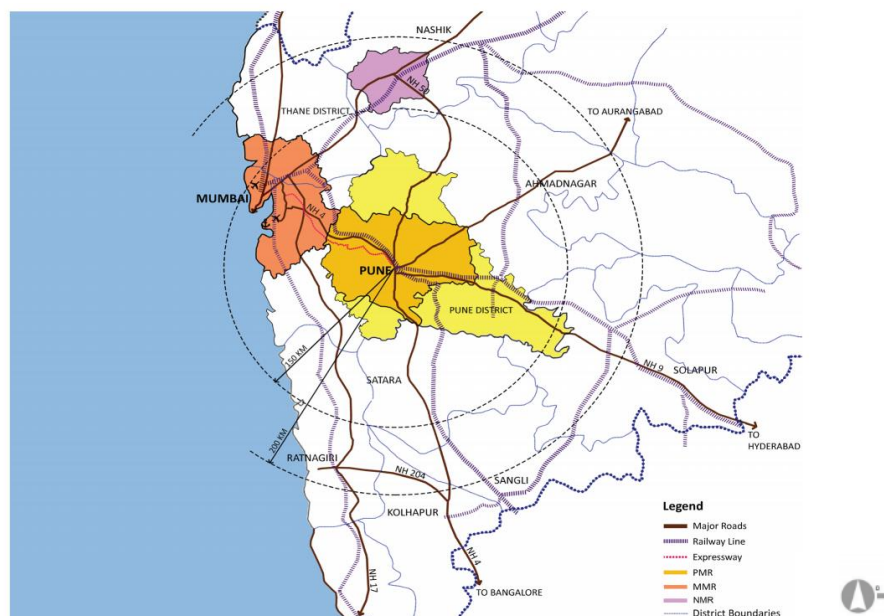


Figure 2.4 “Strategic Location of PMR” (PMRDA, 2021) (MMRDA Map, n.d.) (NMRDA Map, n.d.) (PMRDA Map, n.d.)

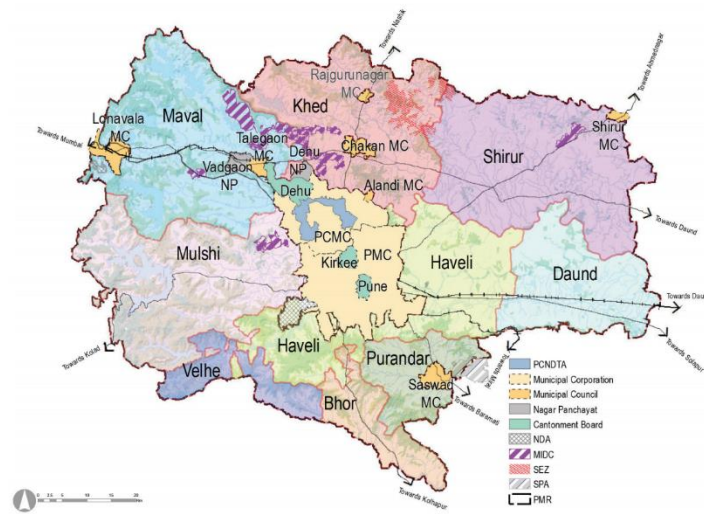


Figure 2.5 “Jurisdictions in PMR” (PMRDA, 2021) (Census, 2011)

2.4.1 Evolution of PMR throughout the History

Early administrative development

The expansion of Pune was started during the era of Maratha King, Chhatrapati Shivaji Maharaj (PMRDA, 2021). The watersheds of rivers that originated in western Maharashtra were collectively termed as Maval Region and it was the early administrative development of Pune Region under Maratha Empire (PMRDA, 2021). Later during British era in 1818, the development of Pune was marked by the establishment of “Army

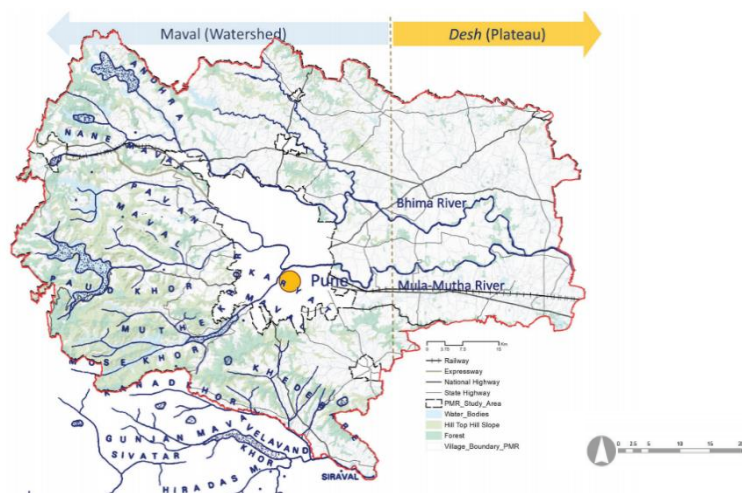


Figure 2.6 Early administrative development (PMRDA, 2021, p. 8)
(A note on 12 Mavals of Poona District, n.d.) (School of Oriental and African Studies, n.d.) (University of London, 1978)

Cantonment Boards” and transportation networks through railway lines such as Bombay (Mumbai)-Poone (Pune) railway (PMRDA, 2021). Further, railways were developed to connect Pune with other parts of the country which uplifted the economy of Pune Region (PMRDA, 2021).

Beginning of industrialization and development of Pimpri-Chinchwad Industrial Town in PMR

After the Independence of India, in 1948, a refugees center was developed in the outskirts of Pune which was formerly known as Pimpri Camp (PCMC, 2021). Pune Municipal Corporation was formed in 1950 (PMC, 2021). Later in 1956, industrial development began in Pimpri with the establishment of Hindustan Antibiotics Limited (PCMC, 2021). The formation of Maharashtra Industrial Development Corporation (MIDC) in 1961-62, boosted the industrial development in Pimpri-Chinchwad (PCMC, 2021). Thus, the newly emerged Pimpri-Chinchwad Industrial Town was attracting people from Maharashtra and outside Maharashtra for employment opportunities (PCMC, 2021).

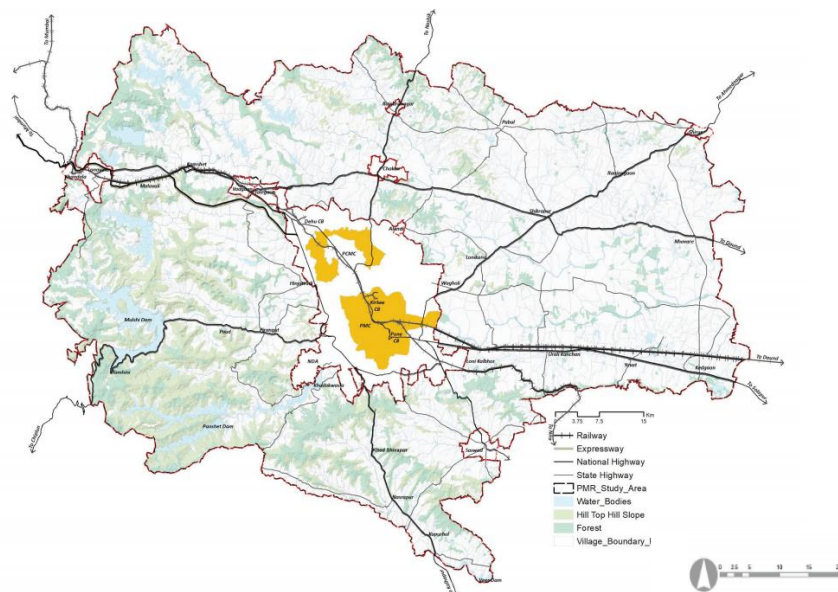


Figure 2.7 Beginning of industrialization and development of Pimpri-Chinchwad Industrial Town in PMR (PMRDA, 2021, p. 9) (Revised Development Plan Pimpri-Chinchwad Municipal Corporation, 1993) (PCMC, 2021) (PMC, 2013)

Foreign Direct Investments supported the growth of automobile manufacturing industries, information and biotechnology industries in Pune Region (PMRDA, 2021). With an objective of planned development for the working population, ‘Pimpri-Chinchwad

Municipal Council’ and ‘Pimpri-Chinchwad New Town Development Authority’ were formed in 1970 (PCMC, 2021). Later in 1982, ‘Pimpri-Chinchwad Municipal Corporation (PCMC)’ was formed (PCMC, 2021). The First Regional Plan of Pune, 1970-91, was sanctioned in 1976 (PMC, 2013). It was revised in 1993 and the revised regional plan was sanctioned in 1997 (PMC, 2013). Divisions of Pune Region include Pune Metropolitan Region (PMR), Western Ghat Area and the remaining eastern and central part of the region (PMC, 2013).

Development outside Municipal Corporation limit

Around 1991, urban decentralization was necessary due to the lack of availability of land for industries and increased land prices within Municipal Corporation limits (PMRDA, 2021). This resulted in industrial development outside PMC and PCMC limits but close to the Municipal Corporation boundaries (PMRDA, 2021). This was marked as the concentric development of fringe areas around PMC and PCMC (PMRDA, 2021). Also, development in ribbon patterns was seen along transportation corridors (PMRDA, 2021).

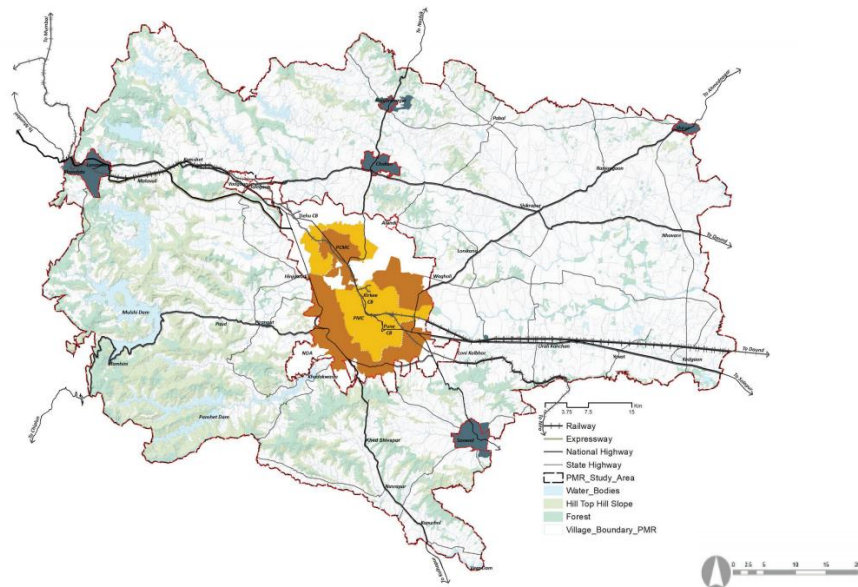


Figure 2.8 Development outside Municipal Corporation limit (PMRDA, 2021, p. 10) (Revised Development Plan Pimpri-Chinchwad Municipal Corporation, 1993) (PCMC, 2021) (PMC, 2013)

Peripheral towns and residential development in fringe areas

Considering the need for decentralization of population, Pune Regional Plan, 1997, proposed new industrial employment opportunities by developing Peripheral towns (PMRDA, 2021). From 1997 to 2001, integration of 18 villages in PCMC and 23 villages in PMC was done for the planned development of residential growth in urban fringe areas. Significant development of IT industry (Industry of Information Technology) was seen in Hinjewadi area in PMR (PMRDA, 2021).

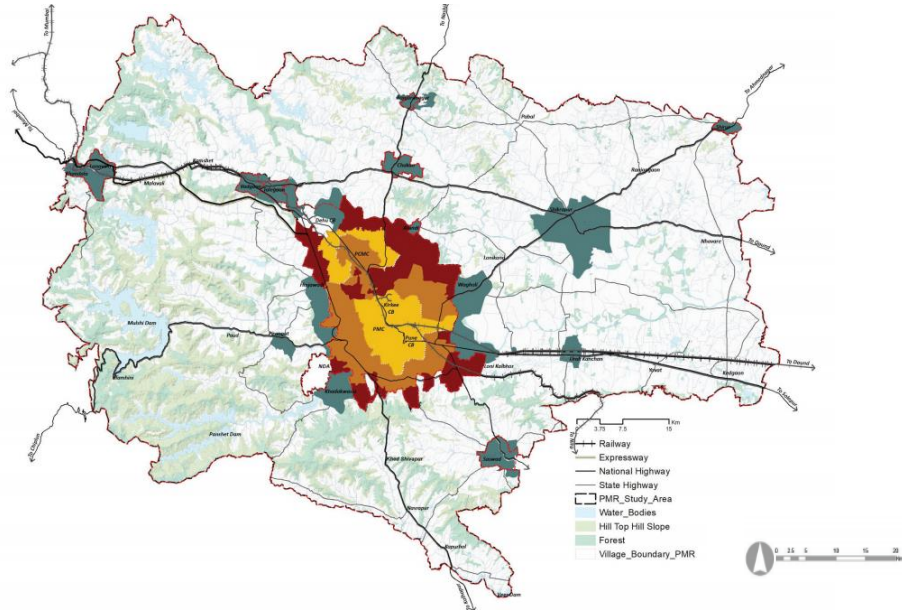


Figure 2.9 Peripheral towns and residential development in fringe areas (PMRDA, 2021, p. 11) (Revised Development Plan Pimpri-Chinchwad Municipal Corporation, 1993) (PCMC, 2021) (PMC, 2013)

Current Pune Metropolitan Region

The current urban agglomeration in Pune Metropolitan Region is in the areas near PMC and PCMC and along the major transportation corridors.

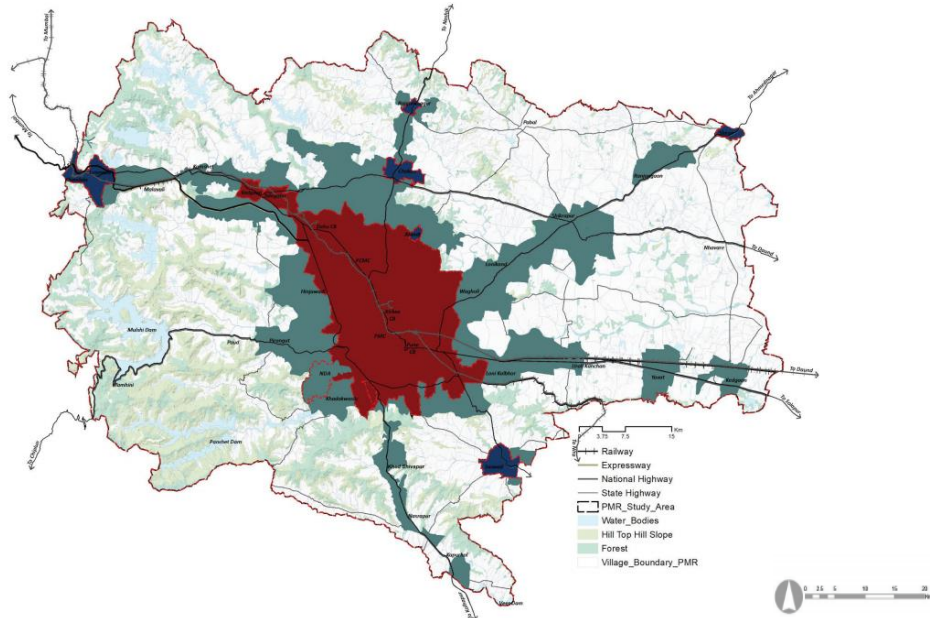


Figure 2.10 Current Pune Metropolitan Region (PMRDA, 2021)

2.4.2 Housing Development in PMR

The approximate percentage of the population residing in urbanized areas of PMR is 78.66% (PMRDA, 2021). Major existing residential developments are concentrated in PMC, PCMC, Haveli, Khed, Mawal, Mulashi and Shirur (PMRDA, 2021). Integrated townships are being developed in the western part of PMR and many such townships are located within a 10 km distance from PMC and PCMC (PMRDA, 2021). ‘Town Planning Schemes’ are being developed in PMR under ‘Maharashtra Town Planning Act, 1966’ (PMRDA, 2021). Pune Metropolitan Development Authority (PMRDA) has planned Mahalunge-Maan Town Planning Scheme which is known as ‘High-Tech City’ (PMRDA, 2021). So overall many private developers are developing promising residential projects in PMR.

2.4.3 Pune Metropolitan Region Development Authority (PMRDA)

The planning authority for PMR was established on 31st March, 2015 known as ‘Pune Metropolitan Region Development Authority (PMRDA)’ (PMRDA, Pune, 2020). PMRDA is responsible for planned physical development and increasing the economic growth of PMR (PMRDA, n.d.). PMRDA is working on major metropolitan planning projects such as Metro Railway, Ring Road and many other urban infrastructure development projects (PMRDA, Pune, 2020).

The mission of PMRDA is to develop PMR in terms of increased international investments and to make PMR the top most livable metropolitan region in India (PMRDA, Pune, 2020). (PMRDA, 2021). Hence, in the coming future, it is important to promote efficient development in the housing sector in PMR (PMRDA, Pune, 2020).

Planning objectives of PMRDA:

- “Ease of doing business with minimum hurdles”
- “Fast Approval of proposals”
- “Greenfield area development”
- “Improvement of ecosystem and environment”
- “Infrastructure development”
- “Use of least energy intensity per capita”
- “High Liveability & Improved Standard of Living”
- “Walk to work environment” (PMRDA, Pune, 2020, Objectives).

Chapter 3. Research Gap

3.1 Research gap identified for the research on factors affecting home buyer's decision of buying a house in PMR

No consideration of Metropolitan Region

The previous research related to housing location preferences was conducted within the administrative boundary of Pune Municipal Corporation and there was no consideration of the influence of Pune Metropolitan Region (PMR) on Housing Development. Factors related to transportation and connectivity in PMR, proximity to the important urban amenities in PMR were not addressed in previous housing preferences research. Most of the previous research is about understanding the housing preferences from a housing marketing management perspective. Not enough attention has been given to the study of housing preferences for better planning of a metropolitan region. Many researchers have focused on one or a few aspects of housing preferences at a time. A comprehensive study considering optimum numbers of factors affecting home buyers' housing preferences is required for effective housing development in a metropolitan region. The factors of housing preferences that are identified in the literature review are rarely studied in PMR.

So far, no study on housing preferences has been conducted in PMR as a whole. With reference to the planning objectives of PMRDA, residential areas in PMR can be considered as a potential choice for many residential developers to build their housing projects. But no study is available related to housing preferences in PMR. PMRDA has not set up any special policy for Residential Area Development that can consider home buyers' housing preferences. The mission of PMRDA is to make PMR the most liveable metropolitan in the country. This mission could be achieved if the housing sector is developed with the consideration of housing preferences in the context of PMR.

Chapter 4. Identification of factors affecting house buying decision in Pune Metropolitan Region, for this research study

Considering the above research gap, factors affecting home buyer's preferences of buying a house in PMR were identified for this research and they are listed into six broad categories as follows:

4.1 Connectivity and transportation

Connectivity to Mumbai city is one of the important strengths of PMR (PMRDA, 2021). Also, currently, PMRDA is working on major transportation projects. Development of 'PMRDA Pune Ring Road' is in the pipeline. This ring road will bypass the traffic of heavy vehicles from outside the city limits (PMRDA, Pune, 2020). More importantly ring road will support the development of suburban areas in the future by providing connectivity to main city roads (PMRDA, Pune, 2020). Metro rail projects in PMR are under execution and it will provide connectivity between PMC, PCMC and IT Hinjewadi (PMRDA, Pune, 2020). Thus, home buyers may prefer to buy a house considering this connectivity and transportation development in PMR. It is necessary to understand which housing preferences are important in terms of factors related to connectivity and transportation in PMR. Hence, the following factors in the context of current connectivity and transportation development in PMR were identified:

1. Connectivity to Pune Mumbai connecting corridor
2. Proximity to proposed PMRDA Pune Ring Road
3. Close proximity to public transportation like bus stops, railway station, BRT corridor, Metro station or airport
4. Connectivity to main city roads
5. Connectivity to Pune City
6. Connectivity to PCMC
7. Connectivity to other parts of PMR

4.2 Proximity to amenities, facilities and services

PMR is known for the number of quality educational institutes. Apart from this due to the availability of employment opportunities PMR has a significant working population who can prefer to reside near their workplaces. Considering the cosmopolitan culture and

lifestyle of the resident's proximity to entertainment centers such as multiplexes, proximity to commercial activities such as restaurants and shopping malls, a nearby daycare center for children can be important for home buyers. Even nearby health care facilities are considerable housing preferences. Provision of amenities, facilities and services in and around the residential area is important to provide convenience and comfort for residents in their daily life. Hence, to understand which housing preferences are the most important in terms of proximity to amenities, facilities and services in PMR, the following factors were identified:

1. walkable distance from convenience stores
2. proximity to entertainment centers like multiplexes
3. proximity to major commercial activities like restaurants & shopping malls
4. proximity to schools/ educational institutes
5. proximity to the day care center for children
6. Proximity to work station
7. Proximity to hospitals and other health care facilities.

4.3 Economy

Consideration of factors related economy is inevitable for any home buyer. Though, with changing economic conditions and family requirements of home buyers, they may consider factors such as renting out possibility of a house for an additional source of income, the future resale value of the house, budget-friendly typology of the house and sufficient size of the house as per family needs and tax benefits on loan. The study of economy-related housing preferences can help to find out the dominant income group of home buyers in PMR. Also, it can help to find out the most preferred housing typologies by different income groups of home buyers. With the study of economy-related housing preferences, private housing developers can provide a wide range of housing units in PMR for different costs for home buyers with different economic conditions. Thus, the following factors related economy were identified:

1. Renting out possibility
2. Larger houses at affordable prices in suburban areas of PMR
3. Good resale value.
4. Size/area and typology of a house based on Home Buyer's budget.
5. Size of house based on family size and family needs.
6. Tax benefit on loan

4.4 Social Aspects

People from different social backgrounds and communities live in PMR. People often choose a house that can suit their education status and profession. Sometimes people may like to stay near their relatives and friends. Even the health requirements of elders in the family can also influence the housing preferences. Hence, it was necessary to include the following factors related to social aspects in this study:

1. Education level
2. Profession
3. Close to the locality where relatives and friends are living
4. Health requirements of elders in the house.

4.5 Architectural Design and planning of housing projects

The study of housing preferences related to attributes of housing units and housing projects is necessary for inducing better living conditions of the residents in PMR. Also, this study is important so that housing developers can create a housing stock as per the requirements of home buyers. Consideration of home buyer's needs during the process of Architectural designing and planning of the housing projects can help housing developers to ensure positive consumers behavior in the housing market of PMR. Hence, the following factors related Architectural Design and planning of the housing projects were identified:

1. Natural Ventilation
2. Natural Daylight
3. Views from the house
4. Flexibility of physical modifications
5. Information technology
6. Vastushastra

4.6 Quality of residential environment and surroundings

In view to making PMR, the most livable metropolitan region it is important to improve the quality of residential zones in PMR by studying housing preferences related quality of the residential environment and surroundings. A house is a reflection of one's lifestyle. Thus, the quality of the residential environment and its surroundings can influence home buyer's personal life and their family life. In order to seek an upgraded, healthy, relaxed and pleasant lifestyle, home buyers can prefer landscaped areas in the housing projects such as gardens, play areas for their children, spaces for exercise such as jogging

track, gym, swimming pool and social gathering space such as clubhouse, etc. For secure and comfortable living, home buyers can consider basic services and facilities like parking, lift, and 24X7 water supply and security. Some people may prefer neighborhoods away from slums, city traffic, pollution and congested areas for peaceful and healthy living. Whereas, some home buyers may prefer residential areas where there is a scope for real estate and urban infrastructure development in the near future so that they can experience vibrant city life. Even the visual appearance of the housing project can be a considerable housing preference. Now a days with the awareness of responsibility towards nature and energy-efficient lifestyle, people may prefer green buildings or energy-efficient housing projects. Also, some may consider housing projects away from crematoriums or burial grounds. Thus, factors related quality of the residential environment and surroundings were identified as follows:

1. Green spaces like the public garden, children play area and jogging track
2. The neighborhood which is away from city traffic, pollution and congested areas.
3. Amenities like swimming pool, gym and clubhouse
4. Services and facilities like parking, lift, and 24X7 water supply, security
5. A house which is not in close proximity to slums
6. A house which is not in close proximity to crematoriums or burial grounds
7. The neighborhood which has the good visual appearance.
8. A house in the area which has scope for real estate and urban infrastructure development in the near future
9. Green Buildings/Energy efficient Housing

Thus, in the context of PMR, this chapter has identified 39 factors of housing preferences that are studied in PMR under this research.

4.7 Theoretical Framework

Based on the identified factors of housing preferences, I have developed a theoretical framework. It has six broad categories/themes that represents a number of housing preferences factors. Those six categories/themes are as follows:

1. Connectivity and transportation
2. Proximity to amenities, facilities and services
3. Economy
4. Social Aspects
5. Architectural Design and planning of housing projects
6. Quality of residential environment and surroundings

A theoretical framework is shown in Figure 4.1.

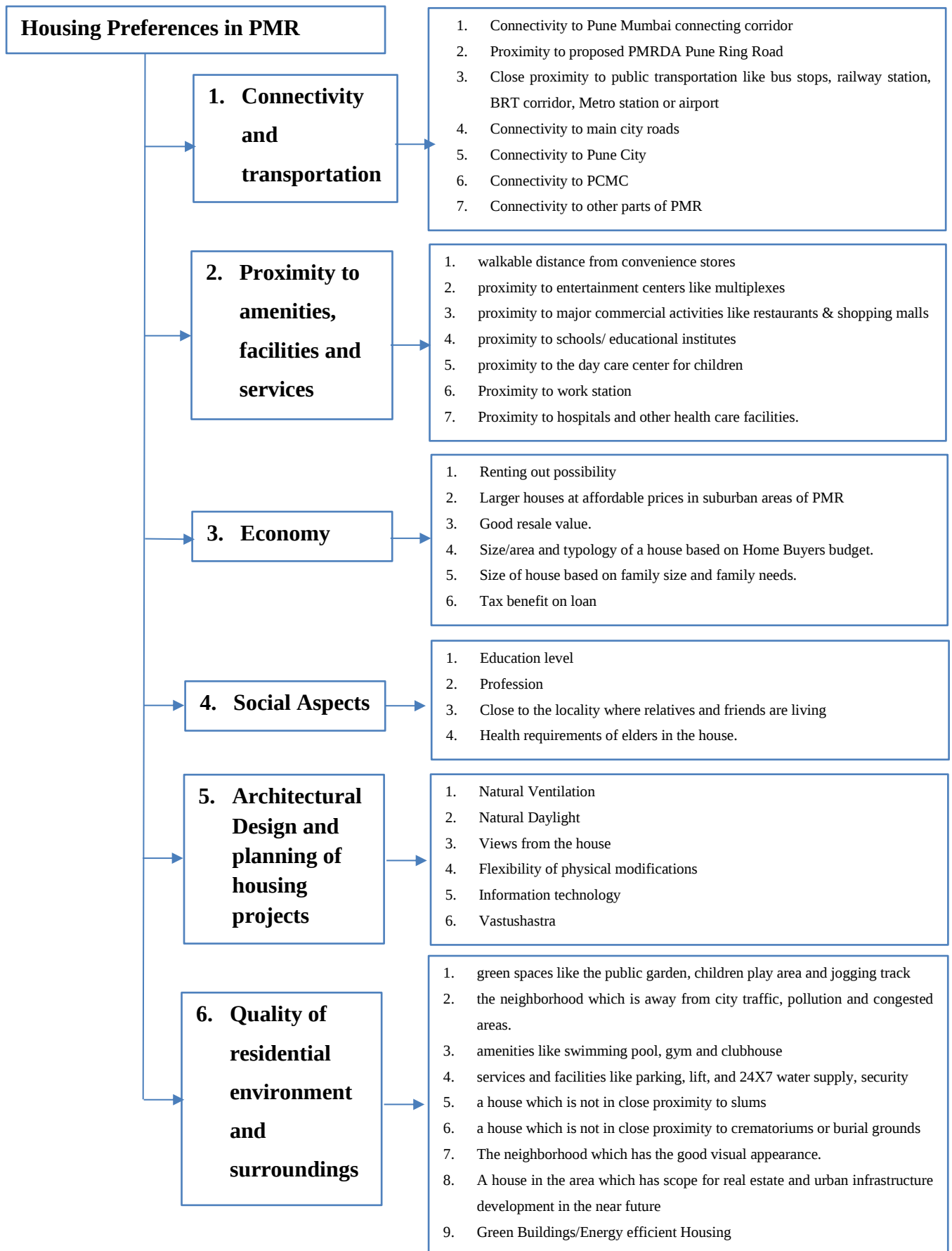


Figure 4.1 Theoretical Framework

Chapter 5. Research Methodology

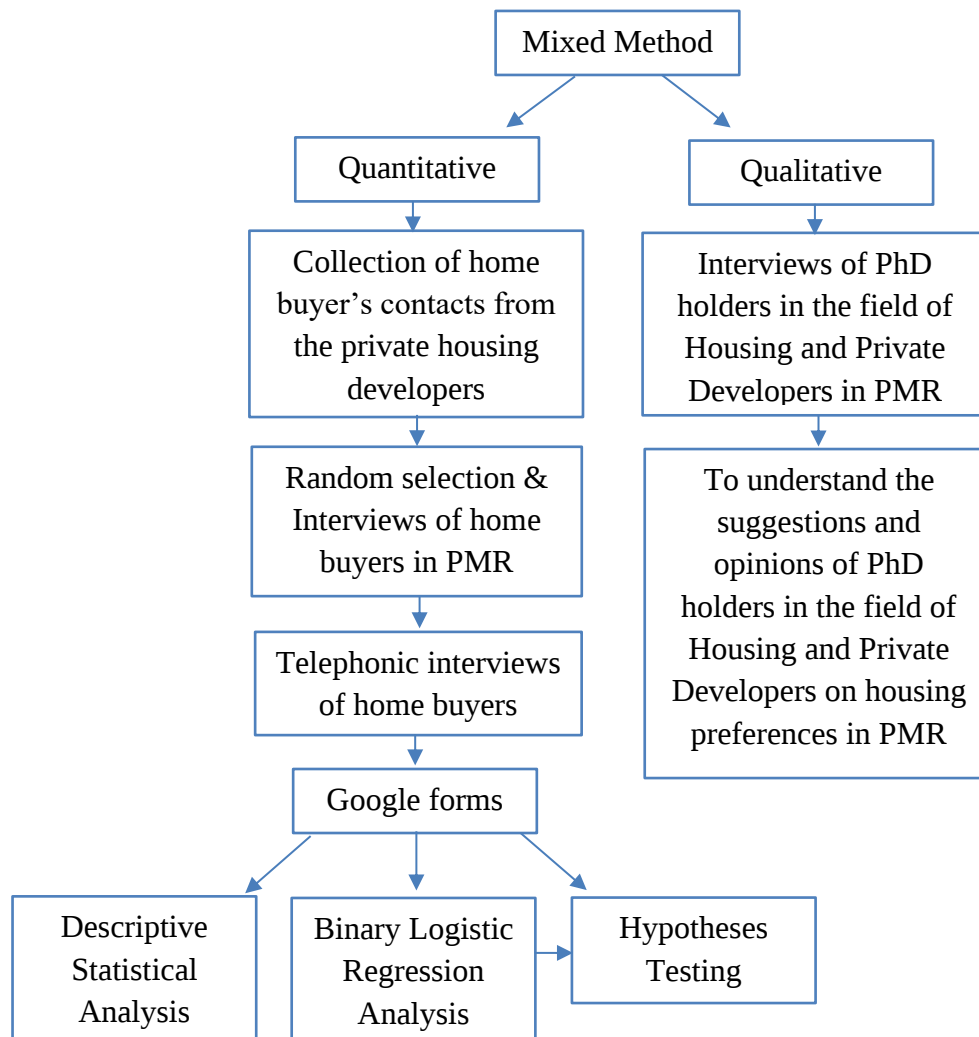


Figure 5.1 Research Methodology

This research has used a mixed methodology that is both quantitative method and qualitative method. In this research, Quantitative method is comprised of interviews of home buyers in PMR and its statistical analysis. Qualitative method is comprised of interviews of some of the Ph.D. holders in the field of housing and Private Housing Developers in PMR. Qualitative method is an additional part of the analysis and it helped to understand suggestions and opinions of the Ph.D. holders in the field of housing and Private Housing Developers, on home buyer's housing preferences in PMR. Statistical Analysis using Descriptive Analysis, Binary Logistic Regression and Hypothesis Testing is applied to the data collected from the interviews of home buyers in PMR. This study is mainly focusing on the home buyer's housing preferences in PMR. Thus, home buyers in PMR are the prime samples of this research. Hence, the major findings of the study are

mainly based on the statistical analysis of the home buyer's responses to the Interview Questionnaire.

5.1 Research Method for Data Collection

Primary data collection was done by the Random Interviews of households in PMR as follows:

5.1.1 Sample Selection

Home buyers who have recently bought a house in the last 5 years and those who are willing to buy a new house in the next 5 years were randomly selected and they were interviewed. As per Census 2011, population of PMR is 73,21,367 (PMRDA, 2021). The required sample size was 500 (An online calculator was used to determine the sample size - <https://select-statistics.co.uk/calculators/sample-size-calculator-population-proportion/> As per this calculator sample size was 385. But sample size was increased to 500 for more accurate results). Contact details of home buyers in PMR were collected from the Marketing Department and Sales Department of the offices of Private Housing Developers. Total 501 home buyers were interviewed in PMR.

5.1.2 Questionnaire Design

Questionnaire for interviews of home buyers in PMR

A questionnaire for interviews of home buyers in PMR was designed based on the quantitative questions. Questions were framed considering the identified 39 factors of housing preferences in PMR as discussed in Chapter 3. Google Forms Application was used for convenient and paperless online record-keeping of all interviews. Google Form was divided into two sections. One section was 'Type A' which was a questionnaire for home buyers who have bought a house in the last five years in PMR and another one was 'Type B' which was a questionnaire for home buyers who are willing to buy a house in the next five years in PMR. Both sections comprised of same questions only with the difference of use of past tense in the questions of 'Type A' section and use of future tense in the questions of 'Type B' section. Even the sequence of the questions was the same in both sections.

Cover page of the questionnaire

The cover page of the questionnaire was comprised of the title of the research, name and contact details of the researcher, name of the research supervisor and name of the

institute where the researcher is pursuing a Ph.D. A brief introduction and purpose of this study were mentioned so that home buyer can easily understand the background of the study. Also, it was clearly mentioned on the cover page that the identity of the home buyers who have participated in the survey will be treated as highly confidential and their responses will be used only for publication of research thesis, publication of research papers in the journals and for paper presentations in the research conferences. Thus, the cover page of the questionnaire was giving all the required information to the home buyers to avoid their hesitation while participating in the interviews.

Background questions

At the beginning of the interview questionnaire, it was compulsory for home buyers to mention their email addresses. Questions 1 to 8 were short answer open-ended questions related to name, address details and contact number. Questions 9 to 14 were about the demographic data of the home buyers such as age, gender, marital status, phase of a family life cycle, education and occupation. Question 9 was a numeric answer open-ended question while questions 10 to 14 were close-ended multiple-choice questions. Questions 15 and 16 were numeric answer open-ended questions related to annual family income and the price of the new house. Questions 15 and 16 were important to study factors related economy. Question 17 was related to the month and year when a home buyer has bought a new house (Type A) or a home buyer is willing to buy a new house (Type B). Questions 18 and 19 were about the reason to buy a new house and the comment about a new house. Question 20 was an open-ended question about two important factors that home buyers have cared about the most (Type A) or home buyers will care the most while making a home buying decision (Type B). Question 20 was very important as it was giving the very first idea about the most important factors of home buyer's housing preferences in PMR.

Questions on factors related to economy

Question 21 was a multiple-choice grid question/ a matrix question. Question 21 was about the consideration of economic factors while buying a new house such as Renting out possibility, a Larger house at an affordable price in the suburban area, Good resale value and Tax benefit on loan. Economic factors were mentioned in the rows and binary responses (Yes/No) were mentioned in the columns of the grid. Home buyers were asked to select either 'Yes' or 'No' response for each of the economic factors. Questions 22 to 24 were multiple-choice questions about general information related to finance such as house price,

preferred loan amount and preferred installment/EMI per month. Next, question 25 was a multiple-choice grid question. This question was about home buyer's preferences related to consideration of the specific area of the house and consideration of the bigger size of the house for growing family size. Home buyers were asked to give their responses to this question as either 'Yes' or 'No'. Questions 26 to 28 were multiple-choice questions about family size, preference for a typology of the house and preference for the area of the house.

Questions on factors related to connectivity and transportation

To begin the discussion related to connectivity and transportation home buyers were asked if they have considered any specific location to stay in PMR (Question 29). The expected response for this question was either 'Yes' or 'No'. For Type B home buyers, question 30 was a short answer open-ended about the location in PMR, where they want to buy a new house. Whereas, for Type A home buyers, information related location of their new houses in PMR was already mentioned in the background questions. Then to carry on further discussion an open-ended question was asked that why they have chosen the particular location for a new house (Type A - Question 30 and Type B - Question 31). Type A - Question 31 and Type B – Question 32 were multiple-choice grid questions about housing preferences related to connectivity and transportation facilities. Rows of the grid were mentioning factors related to connectivity and transportation such as connectivity to Mumbai-Pune corridor, Bus Stops, Railway Station, BRT corridor, Metro Station, Airport, connectivity to main city roads, Connectivity to Pune City through proposed Ring Road/ Direct Highway, Connectivity to PCMC through proposed Ring Road/ Direct Highway, connectivity to other parts of PMR through proposed Ring Road/ Direct Highway and connectivity to proposed Pune Ring Road. Columns of the grid were mentioning 'Yes' and 'No' responses. Thus, home buyers were asked to select either 'Yes' or 'No' for each of the factors related to connectivity and transportation. Type A - Question 32 and Type B – Question 33 were multiple-choice grid questions related to proximity to connectivity and transportation facilities. Again, rows of the grid were mentioning all the above-mentioned connectivity and transportation facilities same as mentioned in Type A - Question 31 and Type B – Question 32. But in Type A - Question 32 and Type B – Question 33, columns of the grid were mentioning options related to proximity such as '0-15 minutes walking', '15-30 minutes Driving Distance', '30-60 minutes Driving Distance', 'More than 60 minutes Driving Distance' and 'Not Applicable'. Home buyers were asked to select any one option from the columns for each of the factors related to connectivity and transportation facilities

in the row. If any connectivity and transportation facility was not applicable for any home buyer then in such case home buyer was asked to click on 'Not Applicable' option.

Questions on factors related to amenities, facilities and services

Type A - Question 33 and Type B – Question 34 were multiple-choice grid questions about housing preferences related to amenities, facilities and services. Rows of the grid were mentioning factors such as Convenience store, Entertainment centers like multiplexes, Commercial activities like restaurants and shopping malls, a Day care center for children, School/College/Educational Institute, Workplace, Hospital and other health care facilities. Columns of the grid were mentioning 'Yes' and 'No' responses. Home buyers were asked to select either 'Yes' or 'No' for each of the factors related to amenities, facilities and services. Also, Type A - Question 34 and Type B – Question 35 were multiple-choice grid questions about proximity to amenities, facilities and services. Rows of the grid were mentioning all amenities, facilities and services same as Type A - Question 33 and Type B – Question 34. But columns of the grid were mentioning the options related to proximity such as '0-15 minutes walking', '15-30 minutes Driving Distance', '30-60 minutes Driving Distance', 'More than 60 minutes Driving Distance' and 'Not Applicable'. Similar to Question 32, home buyers were asked to select proximity preferences for each of the factors in Question 33.

Questions on factors related to Architectural Design and planning of housing projects

Type A - Question 35 and Type B – Question 36 were multiple-choice grid questions about housing preferences related to Architectural Design and planning of housing projects. Rows of the grid were mentioning options such as Natural Ventilation, Natural Daylight, Views from the house, Size/area and typology and Any other – Physical Modifications, Information Technology, Vastushastra. Columns of the grid were mentioning 'Yes' and 'No' responses. Home buyers were asked to select either 'Yes' or 'No' for each of the factors in the question. Next, Type A - Question 36 and Type B – Question 37 were about the importance level of factors related to Architectural Design and planning of housing projects. Same as Type A - Question 35 and Type B – Question 36, all the factors were in the rows of the grid. Columns of the grid were mentioning a five-level scale such as 'Strongly Agree', 'Agree', 'Undecided', 'Disagree' and 'Strongly Disagree'. Home buyers were asked to select any one option from the columns for each of the factors in the rows.

Questions on factors related to the quality of residential environment and surroundings

Type A - Question 37 and Type B – Question 38 were multiple-choice grid questions about housing preferences related quality of the residential environment and surroundings. These questions were similar to Type A - Question 35 and Type B – Question 36. But rows of the grid were mentioning factors such as a green space like public garden, children play area, jogging track, the neighborhood which is away from city traffic, pollution and congested area, amenities like swimming pool, gym and clubhouse, services and facilities like parking, lift, and 24X7 water supply, security, not in close proximity to slums, not in close proximity to crematoriums or burial grounds, the neighborhood which has the good visual appearance, locality which has scope for real estate and urban infrastructure development in near future and Green Buildings/Energy efficient Housing. Columns in the grid were mentioning ‘Yes’ and ‘No’ options. Home buyers were asked to select either ‘Yes’ or ‘No’ for each of the factors in the rows. Type A - Question 38 and Type B – Question 39 were formulated to understand the importance level of factors related quality of the residential environment and surroundings. Same as the above question all the factors were in the rows of the grid. Columns of the grid were mentioning a five-level scale such as ‘Strongly Agree’, ‘Agree’, ‘Undecided’, ‘Disagree’ and ‘Strongly Disagree’. Home buyers were asked to select any one response for each of the factors.

Questions on factors related to social aspects

Type A - Question 39 and Type B – Question 40 were multiple-choice grid questions about housing preferences related to social aspects. Rows of the grid were mentioning options such as status of education of the residents in the residential area, the profession of residents in the residential area, near to the locality where your relatives and friends are living and health requirements of elders in the house. Columns in the grid were mentioning ‘Yes’ and ‘No’ responses. Home buyers were asked to select either ‘Yes’ or ‘No’ for each of the options in the rows of the grid. Type A - Question 40 (Type B – Question 41) and Type A - Question 41 (Type B – Question 42) were multiple-choice questions about home buyers’ preferences related to education status and profession of residents in the locality where home buyers have their new house. Type A - Question 42 and Type B – Question 43 were multiple-choice questions about how much home buyers prefer to buy a house in the locality where their relatives and friends are living. For this

question home buyers were asked to select their responses on a five-level scale such as ‘Strongly Agree’, ‘Agree’, ‘Undecided’, ‘Disagree’ and ‘Strongly Disagree’. Type A - Question 43 and Type B – Question 44 were multiple-choice questions about what health care facilities home buyers prefer near their new house considering the health requirements of their family members.

Questions on general information

While finishing the interviews few open-ended questions were asked about general information such as if home buyers are currently staying in the new house, if there is any difference between their preferences before buying a house and what they have got after buying a new house, if they own a vehicle for daily commuting and if they can give contact details of other home buyers from their own contacts/relatives/friends.

Consent

The last part of the Google Form was stating the consent clause. Home buyers were asked to give their consent by selecting the consent clause before submission of the Google Form.

As discussed above ‘Appendix I’ in this report is the Questionnaire used for the interviews of home buyers in PMR. Before starting the interviews, a pilot survey was conducted to know if home buyers were able to understand the questionnaire.

Questionnaire for interviews of Ph.D. holders in the field of housing and Private Housing Developers in PMR

A semi-structured questionnaire for interviews of Ph.D. holders in the field of housing and Private Housing Developers in PMR, was comprised of open-ended questions listed as follows:

1. What are the problems for housing development in Pune Metropolitan Region?
2. Which locations that most housing projects are selecting in the metro region and why?
3. Do you think, is there any gap between what home buyers want and what private housing developers are providing to them?
4. According to you what are the important factors that can affect housing preferences in PMR considering its urban growth potentials?
5. What is the best preferred location for housing development in PMR and why?

6. Do you carry out a housing preference survey before designating an area as a residential or housing district?
7. Do all planning authorities carry out a housing preference survey before designating housing zones in Pune?
8. What is your housing permitting criteria, do you permit housing anywhere the developer wants?
9. What are the most commonly demanded housing preferences by your housing customers when they come to you to buy a home? What are the three important housing preferences?
10. How PMR customers are different from other cities in terms of their housing preferences? What needs to be done to address their preferences?

The above questionnaires were time to time discussed with Research Supervisor. Also, questionnaires were discussed with Research Review Panel during End Term Presentation.

5.1.3 Interview Survey

Data collection from interviews of home buyers in PMR

Interview Survey of home buyers in PMR was conducted from 23rd July, 2020 to 11 January, 2021. Home buyers who have bought a house in the last 5 years in PMR and home buyers who are willing to buy a house in the next five years in PMR were randomly selected and they were interviewed. The contact details of home buyers were collected from the Marketing Department and the Sales Department of the offices of Private Housing Developers. Also, few home buyers were identified from the references given by friends and colleagues of the researcher. Thus, the contact details of 1621 home buyers in PMR were collected.

Considering the pandemic situations of COVID19, interviews of the home buyers were conducted through telephonic interviews and their responses were recorded through Google Forms. 1413 home buyers were contacted over a phone call, out of which 501 home buyers participated in the interview survey. During the telephonic conversation, a brief of the research and all the questions were explained to the home buyers. Telephonic interviews made it easy for home buyers to understand the questions. It also helped to build trust between home buyers who were participating in the interview survey and the researcher who was conducting the interview survey. Telephonic conversations provided a surety that

information given by the home buyers was true and their responses were unbiased. The use of Google Forms made data-keeping convenient.

Data collection from interviews of Ph.D. holders in the field of housing and Private Housing Developers in PMR

Total 10 people were contacted over a phone call for the Interview Survey. Out of these 10 people, 3 were Ph.D. holders in the field of housing and 7 were Private Housing Developers who have completed and sold out at least 12 housing projects in PMR. Out of 3 Ph.D. holders, one Ph.D. holder who has done the research on housing in Pune City has participated in the Interview Survey. Out of 7 Private Housing Developers, 3 housing developers have participated in the Interview Survey. Interviews of these people helped to understand their suggestions and views related to home buyers' housing preferences in PMR and its importance for the future housing development in PMR.

5.1.4 Statistical Analysis

Responses of the home buyers during the Interview Survey are deriving the major findings of the study. Hence, Descriptive Statistical Analysis and Binary Logistic Regression Analysis are applied to the data collected from the interviews of the home buyers in PMR. Descriptive Statistical Analysis is used to study the frequencies of responses of the home buyers and to organize the collected data in the sample. The responses of home buyers are binary ('Yes' or 'No', 'Agree' or 'Disagree'). Hence, Binary Logistic Regression is applied to find out the relation between dependent and independent variables. Also, Binary Logistic Regression is used for hypothesis testing. To draw clear conclusions from the collected data following hypotheses were formulated and tested for important factors:

H1: Home buyers prefer to buy houses considering 0-30 minutes driving distance from connectivity and transportation facilities.

H2: Home buyers prefer houses where the bus stop is located within 15 minutes walking distance from the house.

H3: home buyers consider amenities and facilities available within the proximity of 0 to 30 minutes driving distance.

H4: Home buyers prefer houses where proximity to convenience stores is within 15 minutes walking distance while buying a new house.

H5: home buyers consider factors related to Architectural Design and planning of the project which include natural ventilation, daylight, views from the house, size and typology of the house.

H6: Home buyers consider all factors related quality of the residential environment and Surroundings.

Binary Logistic Regression

Binary logistic regression is appropriate for hypothesis testing of relationships between the categorical dependent variable (outcome variable) and one or more continuous or categorical independent variables (predictor variables) (Peng et al., 2002). Binary regression can be written as the following equation:

$$\text{Logit (Y)} = \text{natural logs (odds)} = \ln \left(\frac{\pi}{1-\pi} \right) = \alpha + \beta X$$

where,

Y = Dependent categorical variable

X = Independent categorical or continuous variable

$\ln$ = Natural Logarithm

π = Probability

β = Regression Coefficient

IBM SPSS Statistics Version 26, is used for Binary Logistic Regression analysis. Following are the steps to perform Binary Logistic Regression in SPSS:

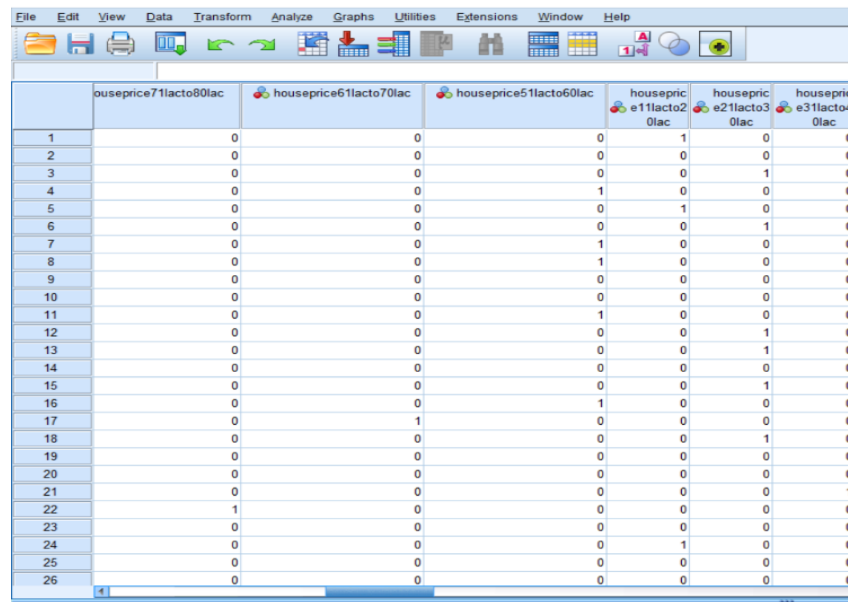
Binary Data Coding

While entering data into statistical analysis software, SPSS, the dichotomous or binary variables are coded as 0 and 1. If the response is “Yes” it is coded as 1 and if it is “No”, it is coded as 0. If the response is “Strongly Agree” or “Agree”, it is coded as 1 and if it is “Undecided” or “Disagree” or “Strongly Disagree” it is coded as 0. For other multiple-choice questions, if any given option is selected then it is coded as 1 and other not selected options are coded as 0. It is shown in the following example:

Table 5.1 Example of Binary Data Coding

0-15 minutes walking distance	0-30 minutes driving distance	30-60 minutes driving distance
1	0	0

Step 1

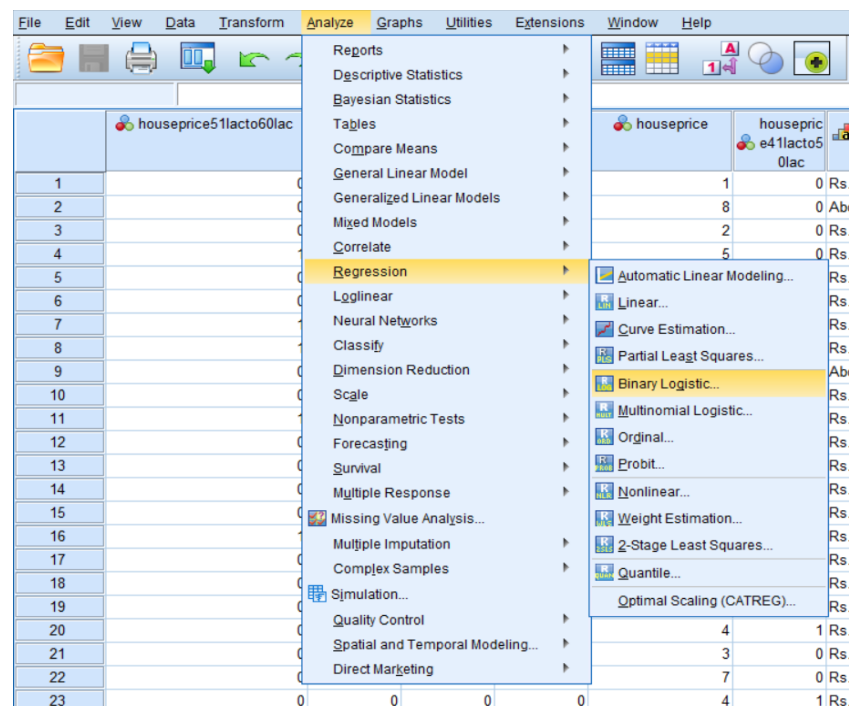


	houseprice71lacto80lac	houseprice61lacto70lac	houseprice51lacto60lac	houseprice41lacto50lac	houseprice31lacto40lac	houseprice21lacto30lac	houseprice11lacto20lac
1	0	0	0	0	1	0	0
2	0	0	0	0	0	0	0
3	0	0	0	0	1	0	0
4	0	0	0	1	0	0	0
5	0	0	0	0	1	0	0
6	0	0	0	0	0	1	0
7	0	0	0	1	0	0	0
8	0	0	0	1	0	0	0
9	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
11	0	0	0	1	0	0	0
12	0	0	0	0	0	1	0
13	0	0	0	0	0	1	0
14	0	0	0	0	0	0	0
15	0	0	0	0	0	1	0
16	0	0	0	1	0	0	0
17	0	0	1	0	0	0	0
18	0	0	0	0	0	1	0
19	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0
21	0	0	0	0	0	0	1
22	1	0	0	0	0	0	0
23	0	0	0	0	0	0	0
24	0	0	0	0	1	0	0
25	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0

Image 5.1 Step 1 – Binary Logistic Regression in IBM SPSS Statistics Version 26

Source: IBM SPSS Statistics Version 26

Step 2



	houseprice51lacto60lac	houseprice41lacto50lac	houseprice31lacto40lac	houseprice21lacto30lac	houseprice11lacto20lac
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
5	0	0	0	0	0
6	0	0	0	0	0
7	0	0	0	0	0
8	0	0	0	0	0
9	0	0	0	0	0
10	0	0	0	0	0
11	0	0	0	0	0
12	0	0	0	0	0
13	0	0	0	0	0
14	0	0	0	0	0
15	0	0	0	0	0
16	0	0	0	0	0
17	0	0	0	0	0
18	0	0	0	0	0
19	0	0	0	0	0
20	0	0	0	0	0
21	0	0	0	0	0
22	0	0	0	0	0
23	0	0	0	0	0

Image 5.2 Step 2 – Binary Logistic Regression in IBM SPSS Statistics Version 26

Source: IBM SPSS Statistics Version 26

Step 3

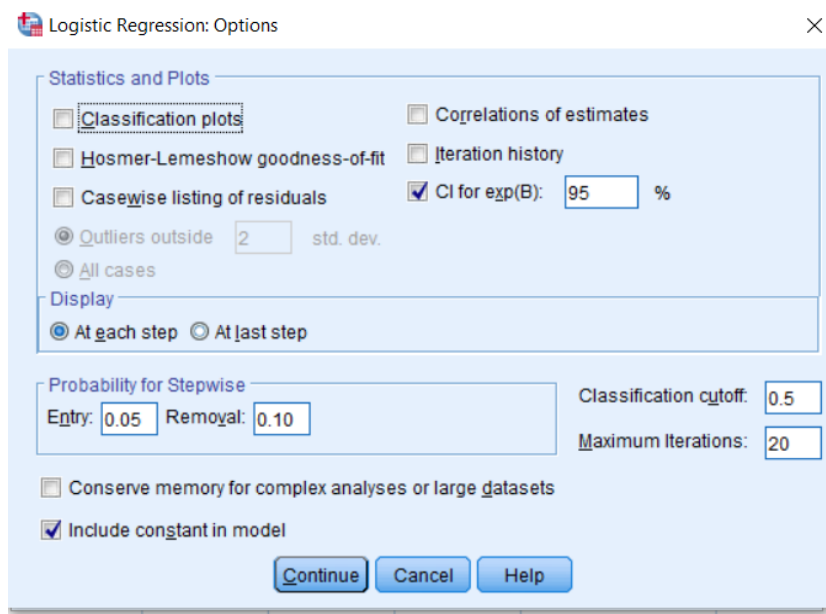


Image 5.3 Step 3 – Binary Logistic Regression in IBM SPSS Statistics Version 26
Source: IBM SPSS Statistics Version 26

Step 4

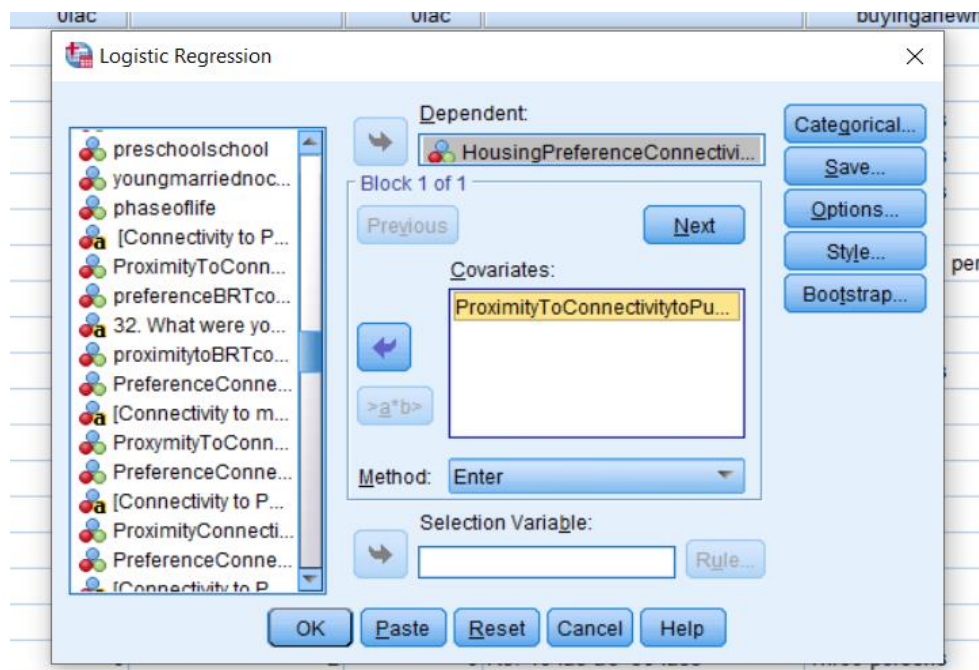


Image 5.4 Step 4 – Binary Logistic Regression in IBM SPSS Statistics Version 26
Source: IBM SPSS Statistics Version 26

Step 5

		Variables in the Equation							
		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
Step 1 ^a	ProximityToConnectivitytoPuneMumbaiconnectingcorridor	3.742	.483	60.100	1	.000	42.162	16.372	108.576
	Constant	-2.361	.468	25.466	1	.000	.094		

a. Variable(s) entered on step 1: ProximityToConnectivitytoPuneMumbaiconnectingcorridor.

Image 5.5 Step 5 – Binary Logistic Regression in IBM SPSS Statistics Version 26

Source: IBM SPSS Statistics Version 26

Chapter 6. Results and Discussions

6.1 Descriptive Statistical Analysis

This section of the chapter includes a descriptive analysis of data collected from the interviews of home buyers. Total 501 home buyers have participated in the interview survey out of which 386 home buyers have bought a house in the last five years and 115 home buyers are willing to buy a house in the next five years. Data is organized in the graphs and findings are drawn from the graphs as follows:

Responses

- Type A : Home Buyer who has bought a house in the last five years
- Type B : Home Buyer who is willing to buy a house in the next five years

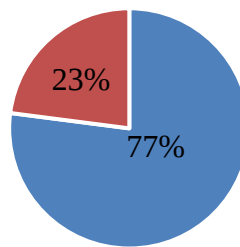


Figure 6.1 Types of responses

Source: Google Forms Summary

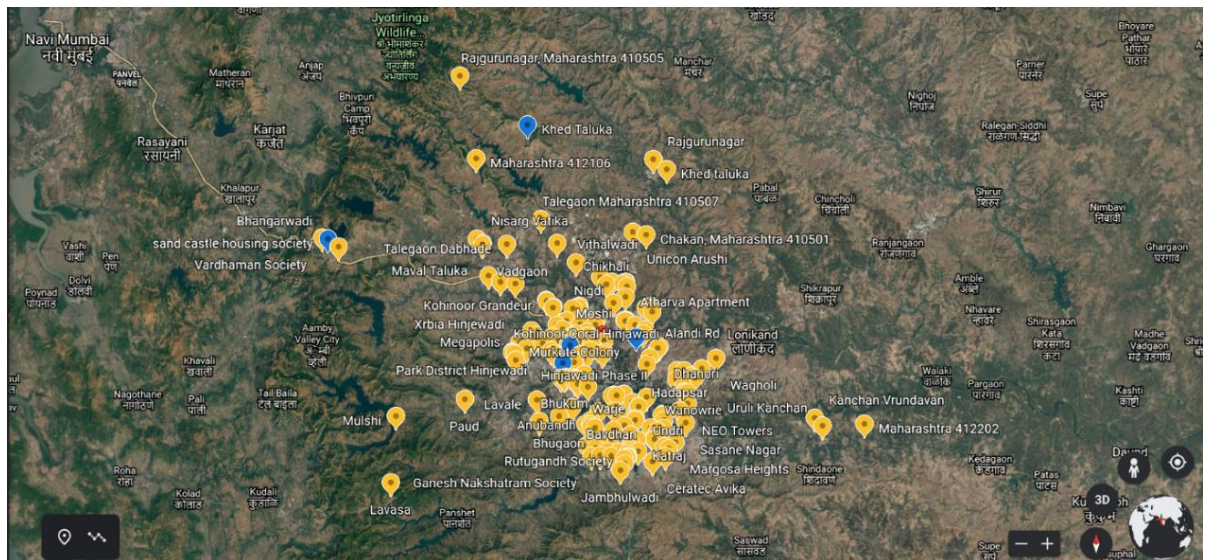


Image 6.1 Map showing locations of respondents

Source: Google Maps

6.1.1 Responses related to Demographic Characteristics

Type A (Home buyer who has bought a house in the last five years)

Gender

386 responses

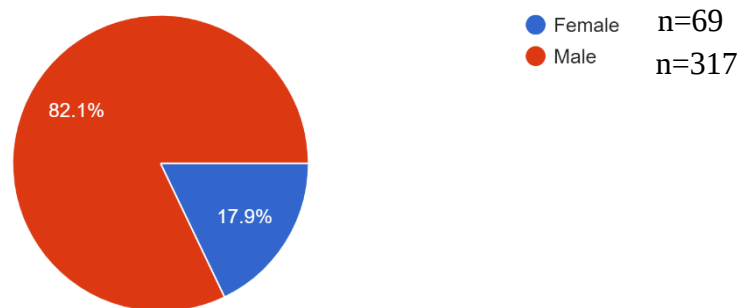


Figure 6.2 Type A - Gender

Source: Google Forms Summary

Type B (Home buyer who is willing to buy a house in the next five years)

Gender

115 responses

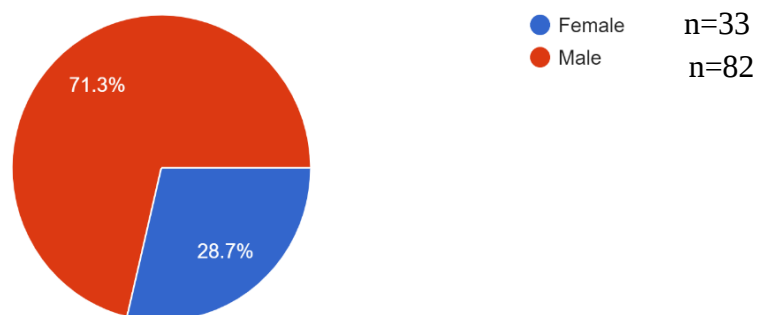


Figure 6.3 Type B - Gender

Source: Google Forms Summary

Type A (Home buyer who has bought a house in the last five years)

Marital Status

386 responses

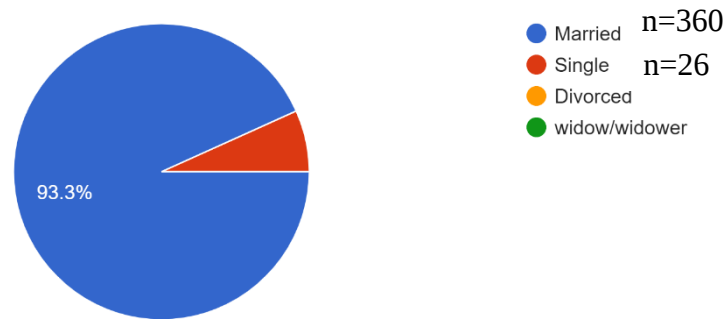


Figure 6.4 Type A - Marital Status

Source: Google Forms Summary

Type B (Home buyer who is willing to buy a house in the next five years)

Marital Status

115 responses

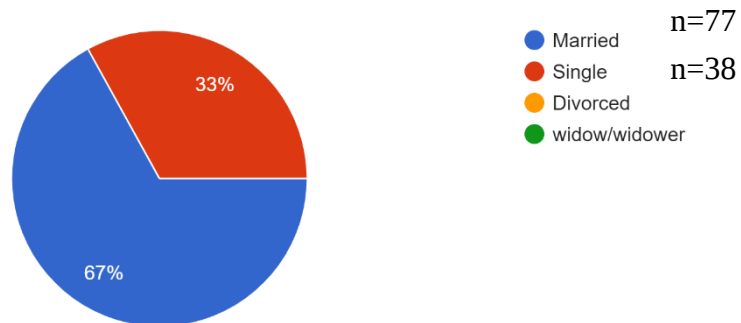


Figure 6.5 Type B - Marital Status

Source: Google Forms Summary

Type A (Home buyer who has bought a house in the last five years)

A phase of family life cycle

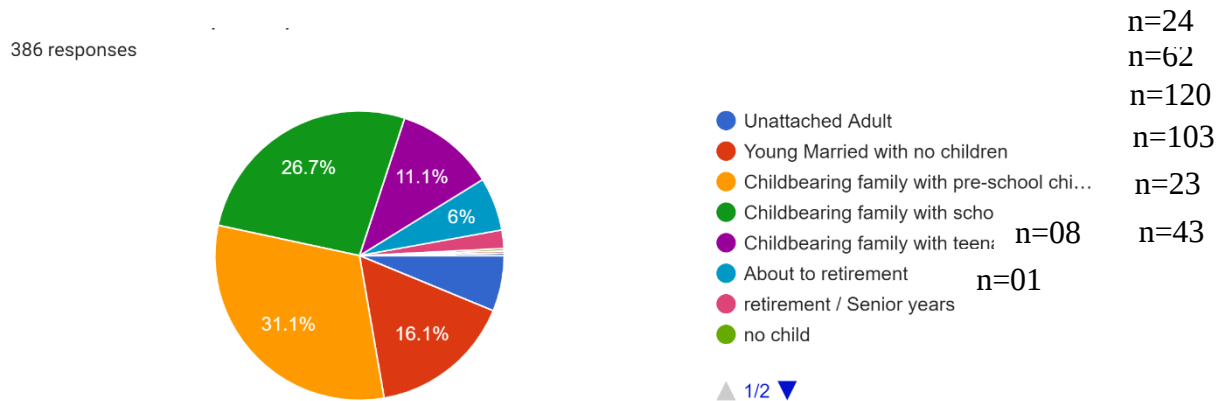


Figure 6.6 Type A - Phase of Family Life Cycle

Source: Google Forms Summary

Type B (Home buyer who is willing to buy a house in the next five years)

A phase of family life cycle

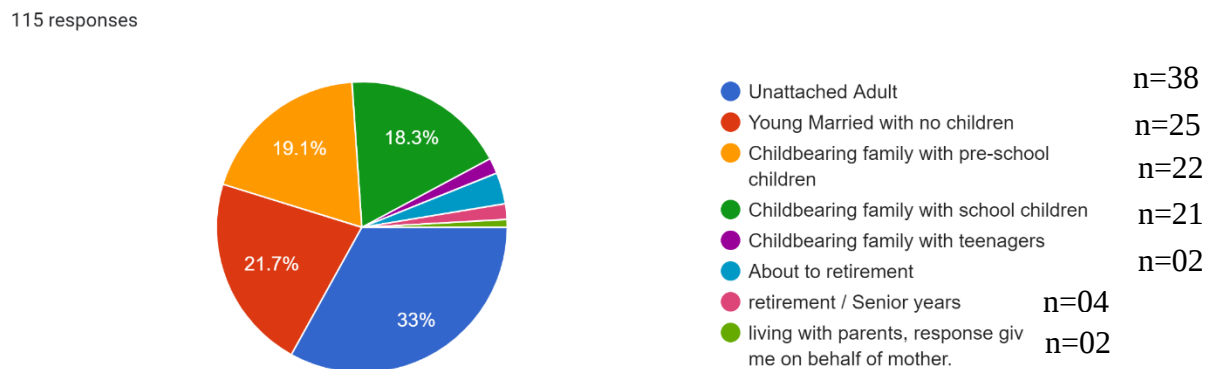


Figure 6.7 Type B - Phase of Family Life Cycle

Source: Google Forms Summary

Type A (Home buyer who has bought a house in the last five years)

Education

386 responses

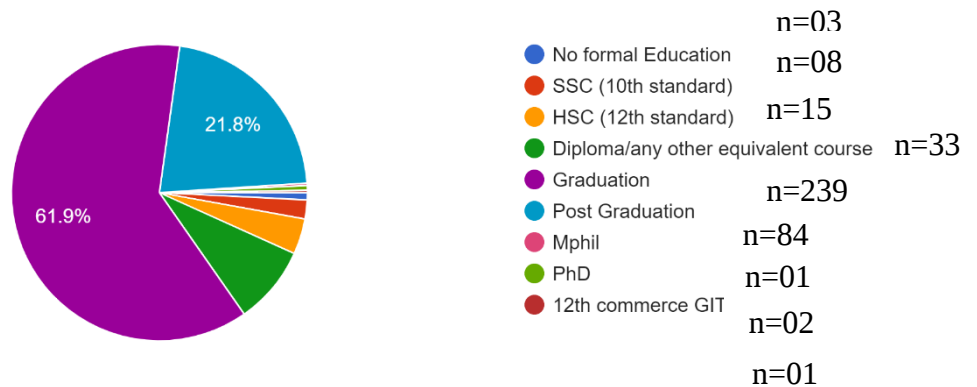


Figure 6.8 Type A - Education

Source: Google Forms Summary

Type B (Home buyer who is willing to buy a house in the next five years)

Education

115 responses

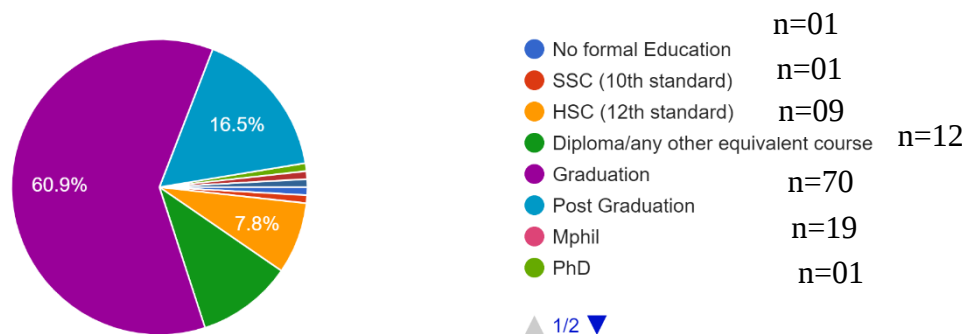


Figure 6.9 Type B - Education

Source: Google Forms Summary

Type A (Home buyer who has bought a house in the last five years)

Occupation

386 responses

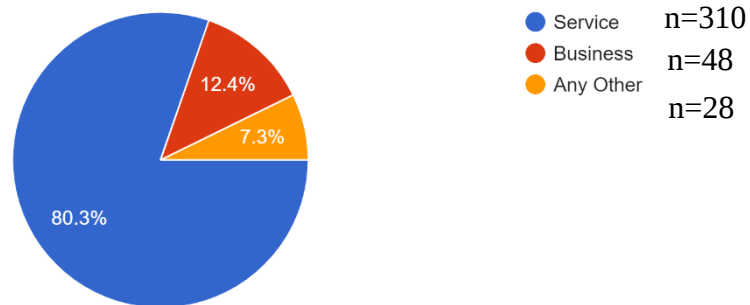


Figure 6.10 Type A - Occupation

Source: Google Forms Summary

Type B (Home buyer who is willing to buy a house in the next five years)

Occupation

115 responses

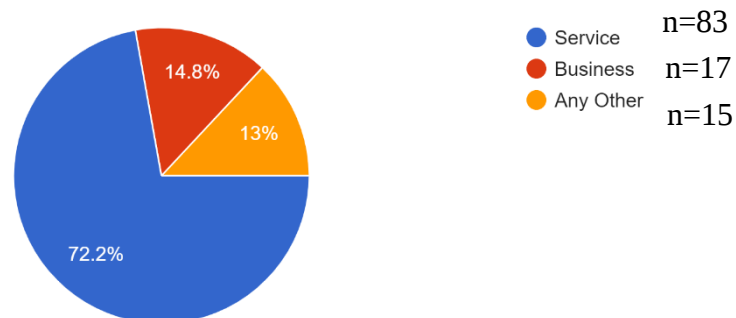


Figure 6.11 Type B - Occupation

Source: Google Forms Summary

Type A (Home buyer who has bought a house in the last five years) and Type B (Home buyer who is willing to buy a house in the next five years)

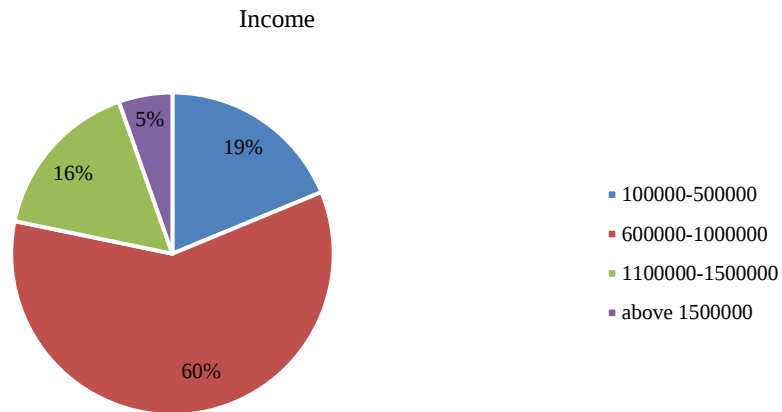


Figure 6.12 Annual Family Income

Source: Prepared by Author

20. What four factors you cared the most while making a home buying decision?

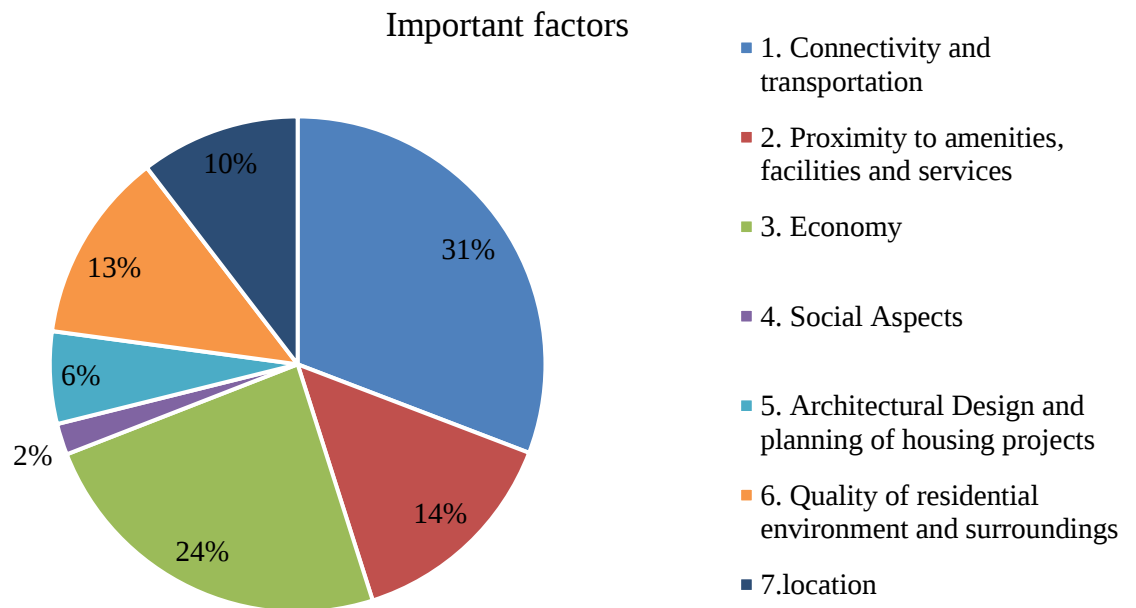


Figure 6.13 Important factors

Source: Prepared by Author

6.1.2 Responses related to Economic Factors

Type A (Home buyer who has bought a house in the last five years)

21. Did you buy a new house considering following Housing Preferences related finance ?

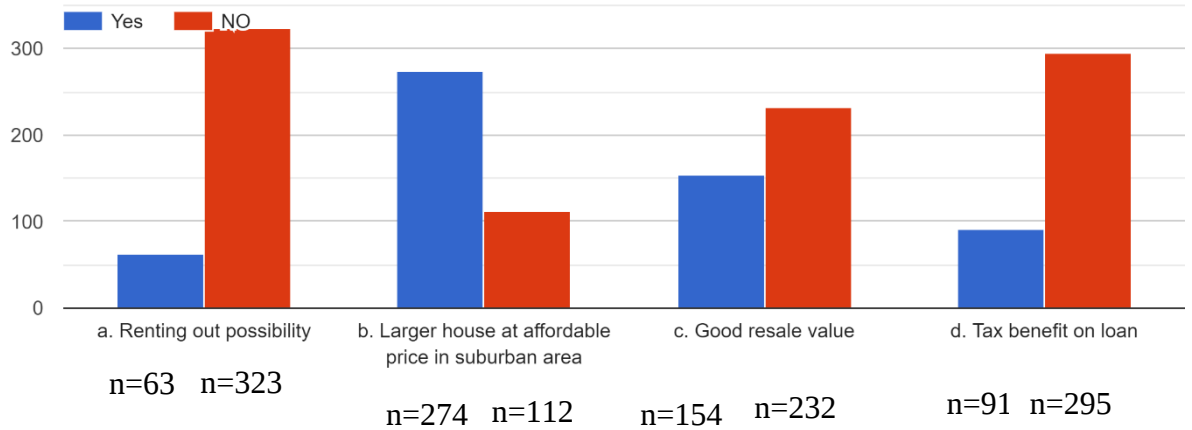


Figure 6.14 Type A - Economic Factors

Source: Google Forms Summary

Type B (Home buyer who is willing to buy a house in next five years)

21. Will you buy a new house considering following Housing Preferences related finance ?

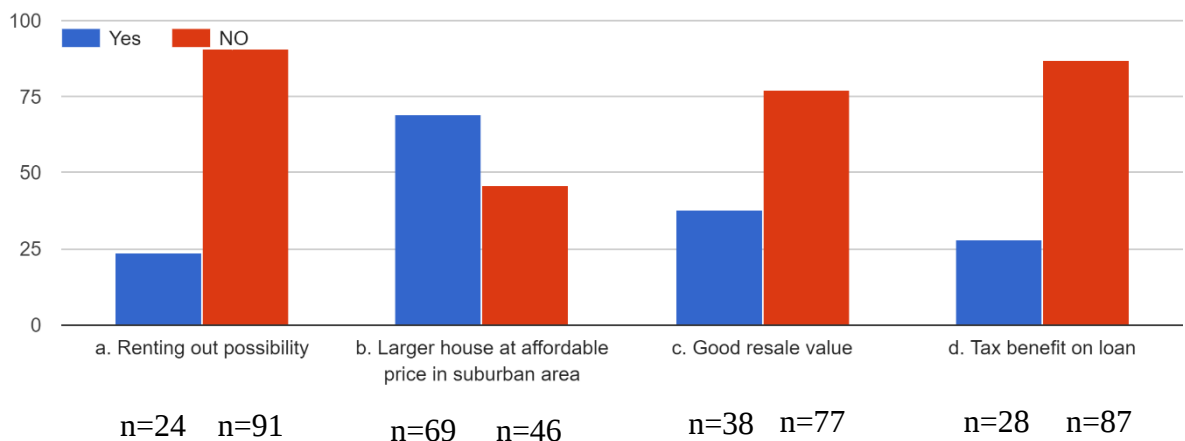


Figure 6.15 Type B - Economic Factors

Source: Google Forms Summary

Findings from Descriptive Statistical Analysis (Figure 6.14 and Figure 6.15):

In the above bar charts (Figure 6.14 and Figure 6.15), it can be seen that out of four economic factors related to a home buying decision, 68.46% i.e., 343 out of 501 home buyers have preferred to buy a larger house in suburban areas of PMR at affordable prices.

Type A (Home buyer who has bought a house in the last five years) and Type B (Home buyer who is willing to buy a house in the next five years)

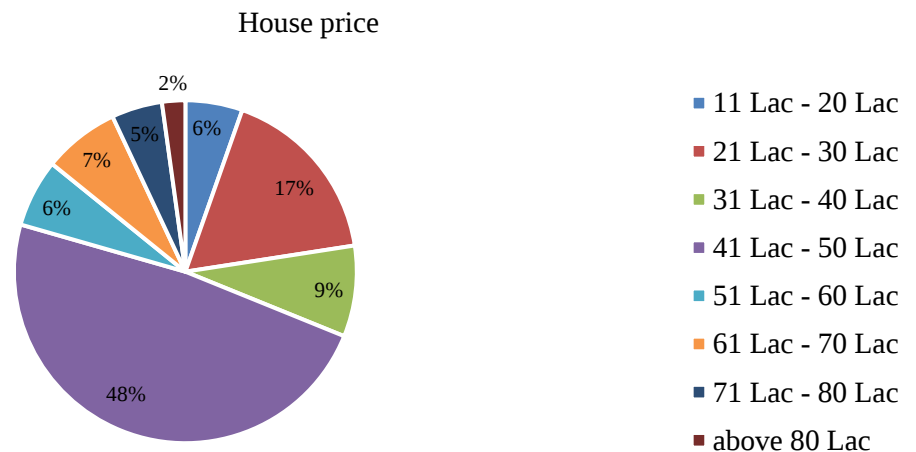


Figure 6.16 Price of the new house

Source: Prepared by Author

Findings from Descriptive Statistical Analysis (Figure 6.16):

In the above pie chart (Figure 6.16) the most preferred housing costs are ranging from 41 lacs to 50 lacs. This range is preferred by 48% of home buyers. It is followed by the housing costs ranging from 21 lacs to 30 lacs which is preferred by 17% of home buyers.

Type A (Home buyer who has bought a house in the last five years)

23. How much housing loan did you preferred?

386 responses

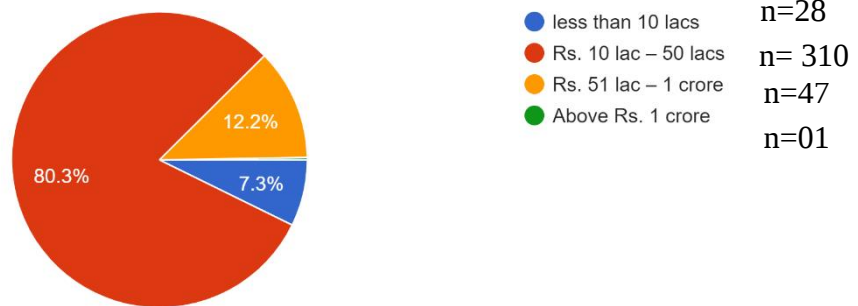


Figure 6.17 Type A - Housing Loan

Source: Google Forms Summary

Type B (Home buyer who is willing to buy a house in the next five years)

23. How much housing loan will you preferred?

115 responses

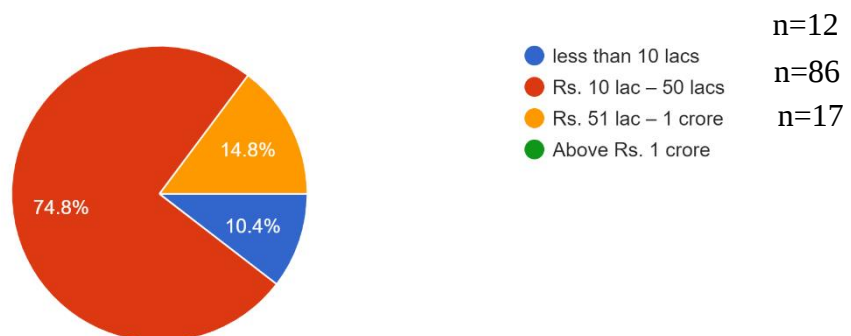


Figure 6.18 Type B - Housing Loan

Source: Google Forms Summary

Type A (Home buyer who has bought a house in the last five years)

24. How much EMI of housing loan did you preferred per month?

386 responses

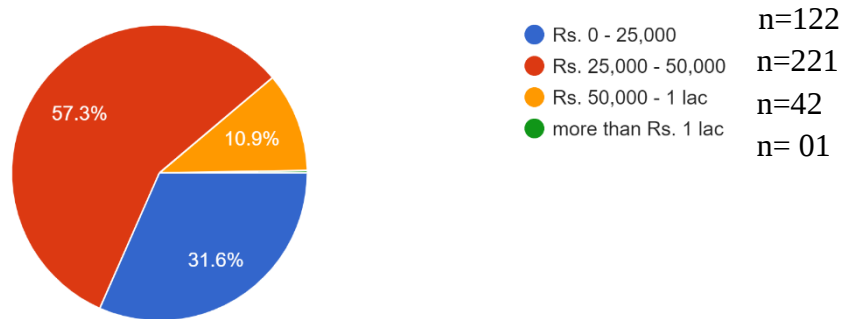


Figure 6.19 Type A - EMI

Source: Google Forms Summary

Type B (Home buyer who is willing to buy a house in the next five years)

24. How much EMI of housing loan will you prefer per month?

115 responses

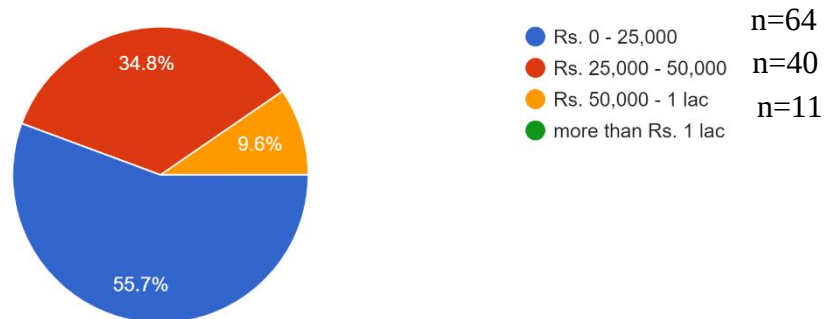


Figure 6.20 Type B - EMI

Source: Google Forms Summary

Type A (Home buyer who has bought a house in the last five years)

25. Did you buy a new house considering following housing preferences related area of the house?

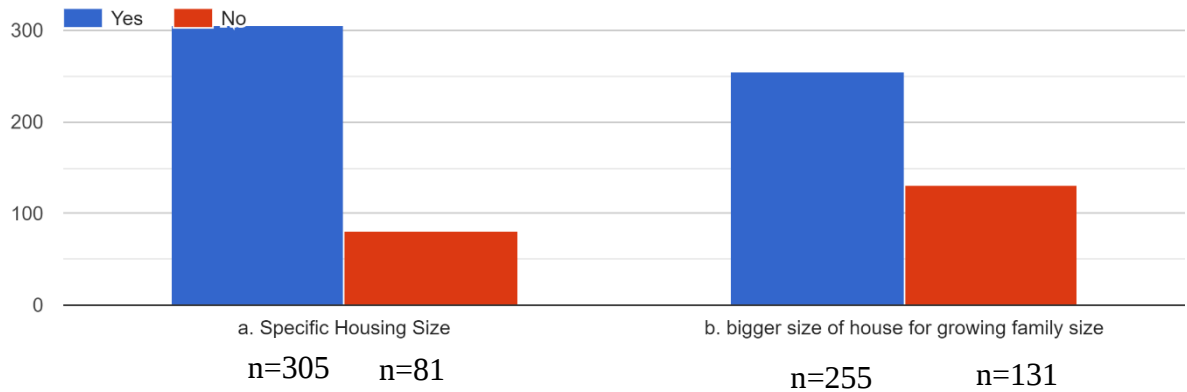


Figure 6.21 Type A - Area of the house

Source: Google Forms Summary

Type B (Home buyer who is willing to buy a house in the next five years)

25. Will you buy a new house considering following housing preferences related area of the house?

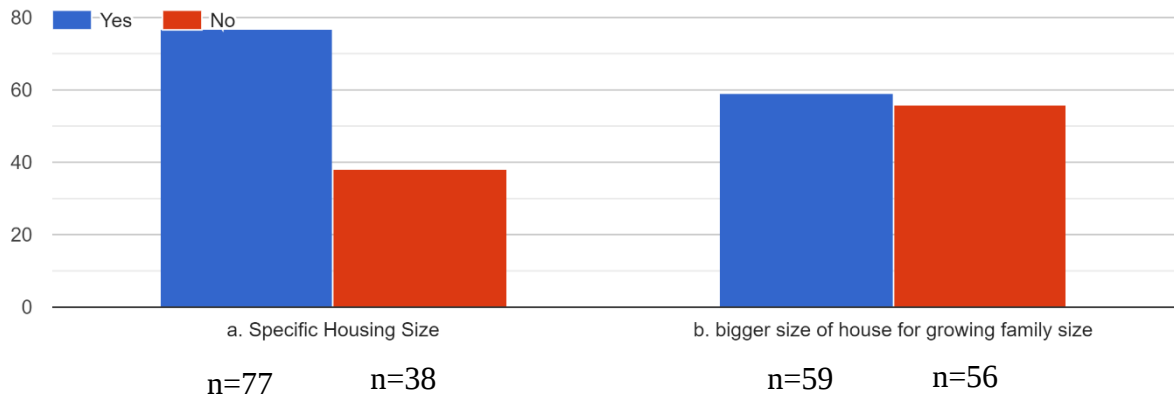


Figure 6.22 Type B - Area of the house

Source: Google Forms Summary

Type A (Home buyer who has bought a house in the last five years)

26. What family size did you consider while buying a new house?

386 responses

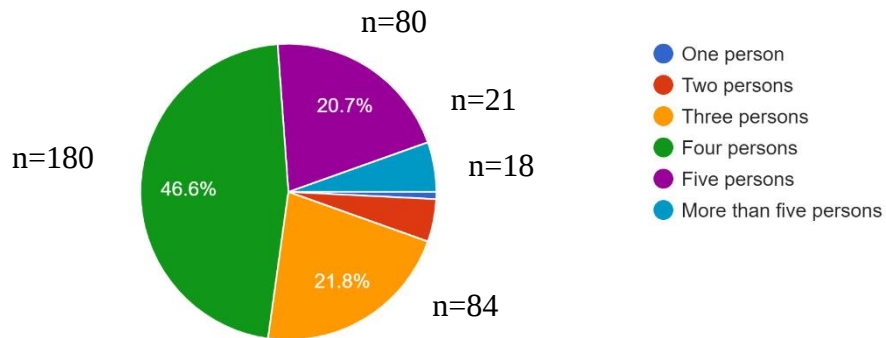


Figure 6.23 Type A - Family Size

Source: Google Forms Summary

Type B (Home buyer who is willing to buy a house in the next five years)

26. What family size will you consider while buying a new house?

115 responses

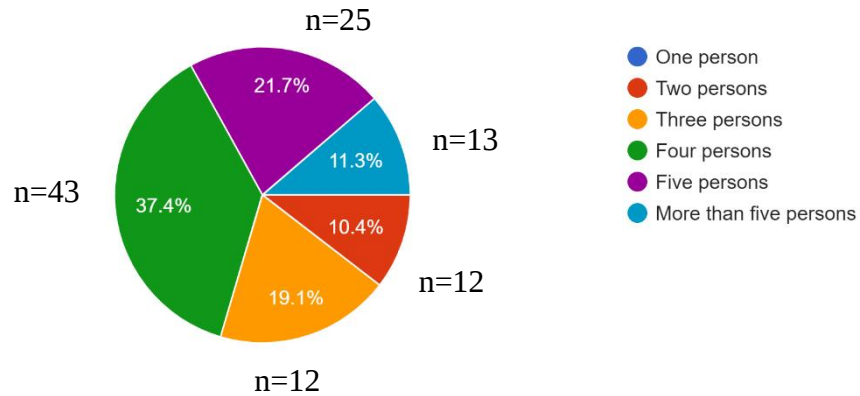


Figure 6.24 Type B - Family Size

Source: Google Forms Summary

Type A (Home buyer who has bought a house in the last five years) and Type B (Home buyer who is willing to buy a house in the next five years)

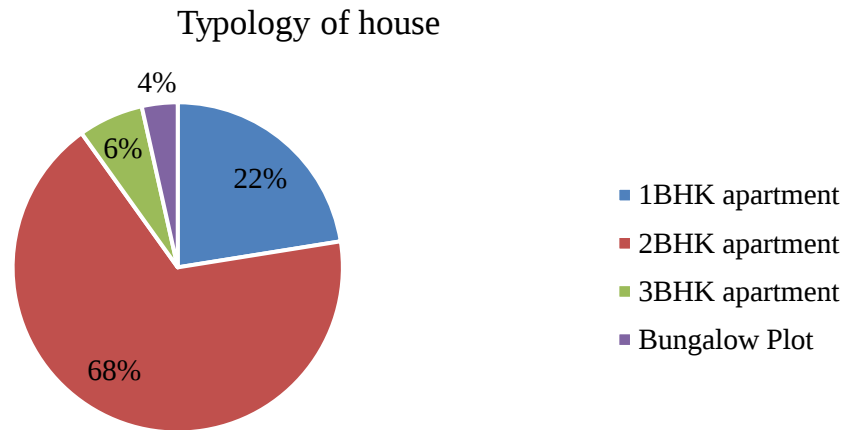


Figure 6.25 Housing Typology

Source: Prepared by Author

Type A (Home buyer who has bought a house in the last five years) and Type B (Home buyer who is willing to buy a house in the next five years)

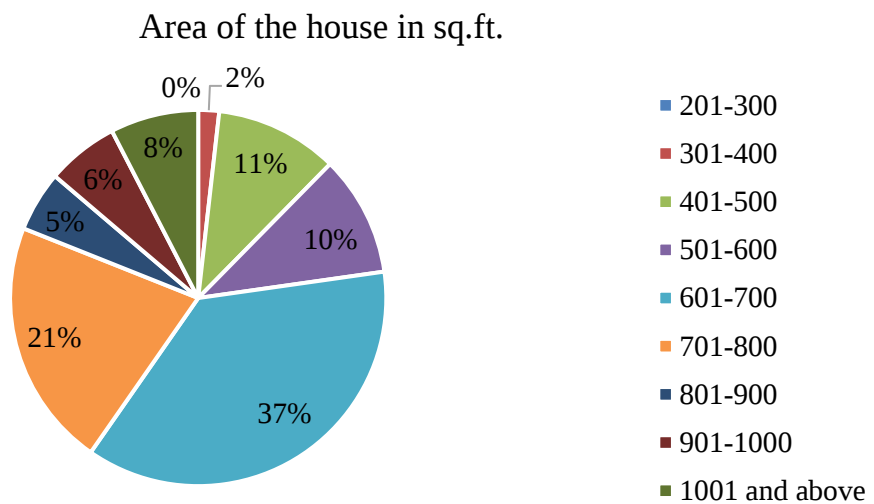


Figure 6.26 Area of the house

Source: Prepared by Author

Findings from Descriptive Statistical Analysis (Figure 6.21, Figure 6.22, Figure 6.23, Figure 6.24, Figure 6.25 and Figure 6.26):

76.26% of home buyers (Figure 6.21 and Figure 6.22) have considered specific housing size as the most important factor while buying a new house. It is followed by another factor that is the bigger size of the house for growing family size (62.67%). The most preferred housing typology is 2BHK. Around 68% of home buyers have preferred 2bhk apartments (Figure 6.25) then it is followed by 1bhk apartments (22%). 37% of home buyers (Figure 6.26) have preferred to buy new houses of carpet areas varying from 601 sq. ft to 700 sq. ft. It is followed by houses of carpet areas varying from 701 sq. ft to 800 sq. ft. (21%). 84.63% of home buyers (Figure 6.23 and Figure 6.24) have preferred to buy new houses considering family size varying from 3 persons to 5 persons.

6.1.3 Responses related to connectivity and transportation

Type A (Home buyer who has bought a house in the last five years)

29. Did you prefer to buy a new house because you wanted to stay at the specific location in Pune Metropolitan region?

386 responses

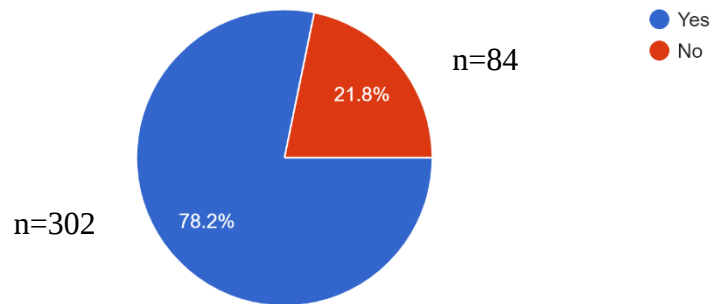


Figure 6.27 Type A - Location

Source: Google Forms Summary

Type B (Home buyer who is willing to buy a house in the next five years)

29. Will you prefer to buy a new house because you want to stay at the specific location in Pune Metropolitan region?

115 responses

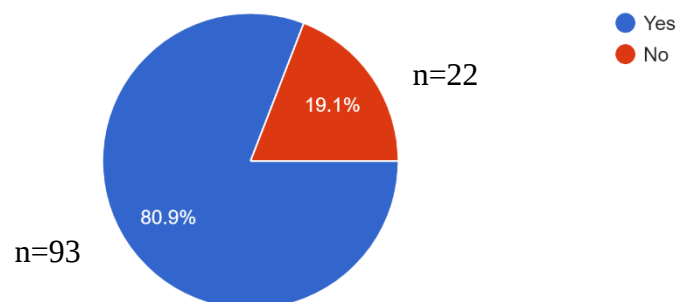


Figure 6.28 Type B - Location

Source: Google Forms Summary

Findings from Descriptive Statistical Analysis (Figure 6.27 and Figure 6.28):

78.84% of home buyers (Figure 6.27 and Figure 6.28) have bought new houses considering their location factor.

Type A (Home buyer who has bought a house in the last five years)

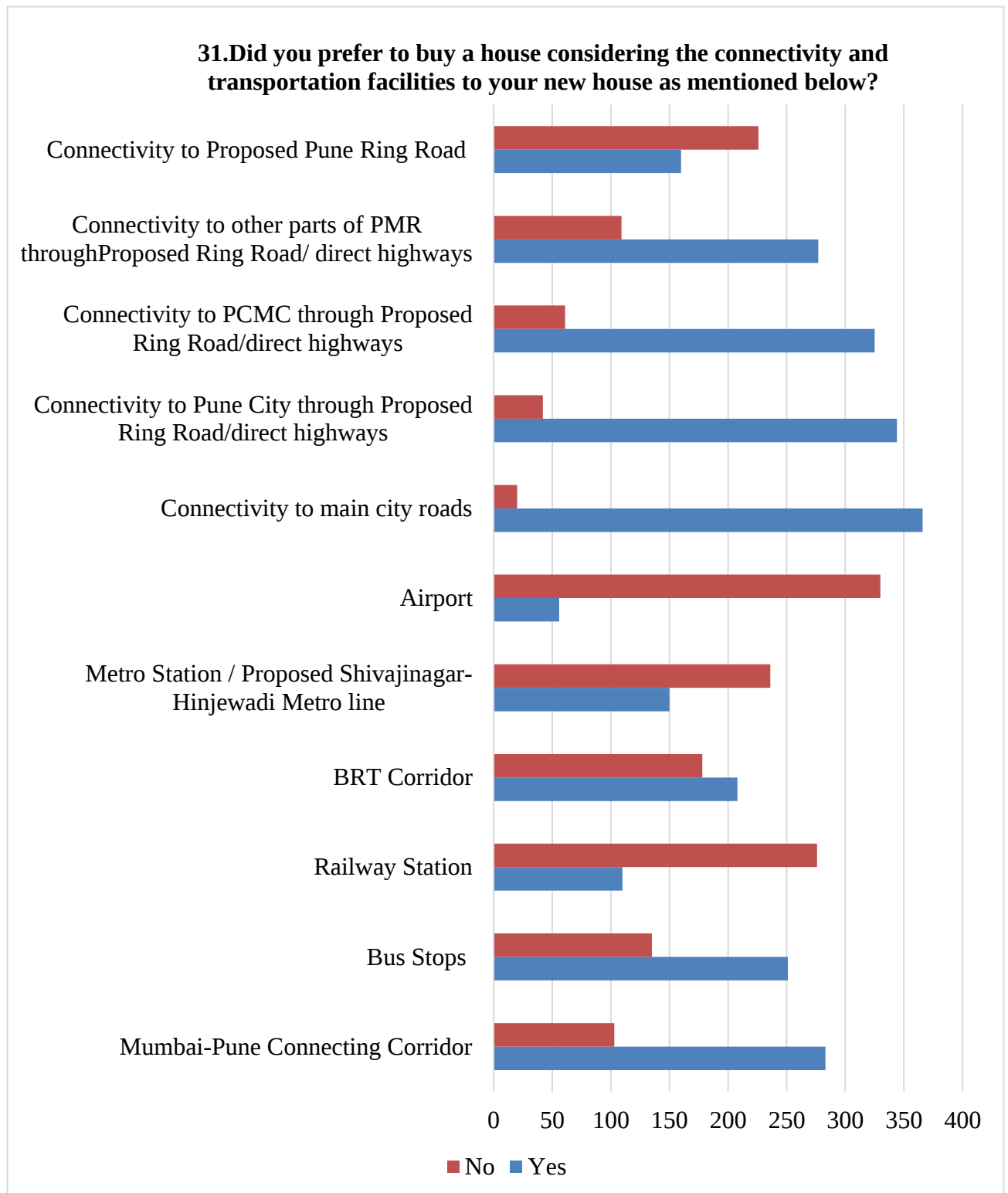


Figure 6.29 Type A - Connectivity and transportation facilities

Source: Prepared by Author

Type B (Home buyer who is willing to buy a house in the next five years)

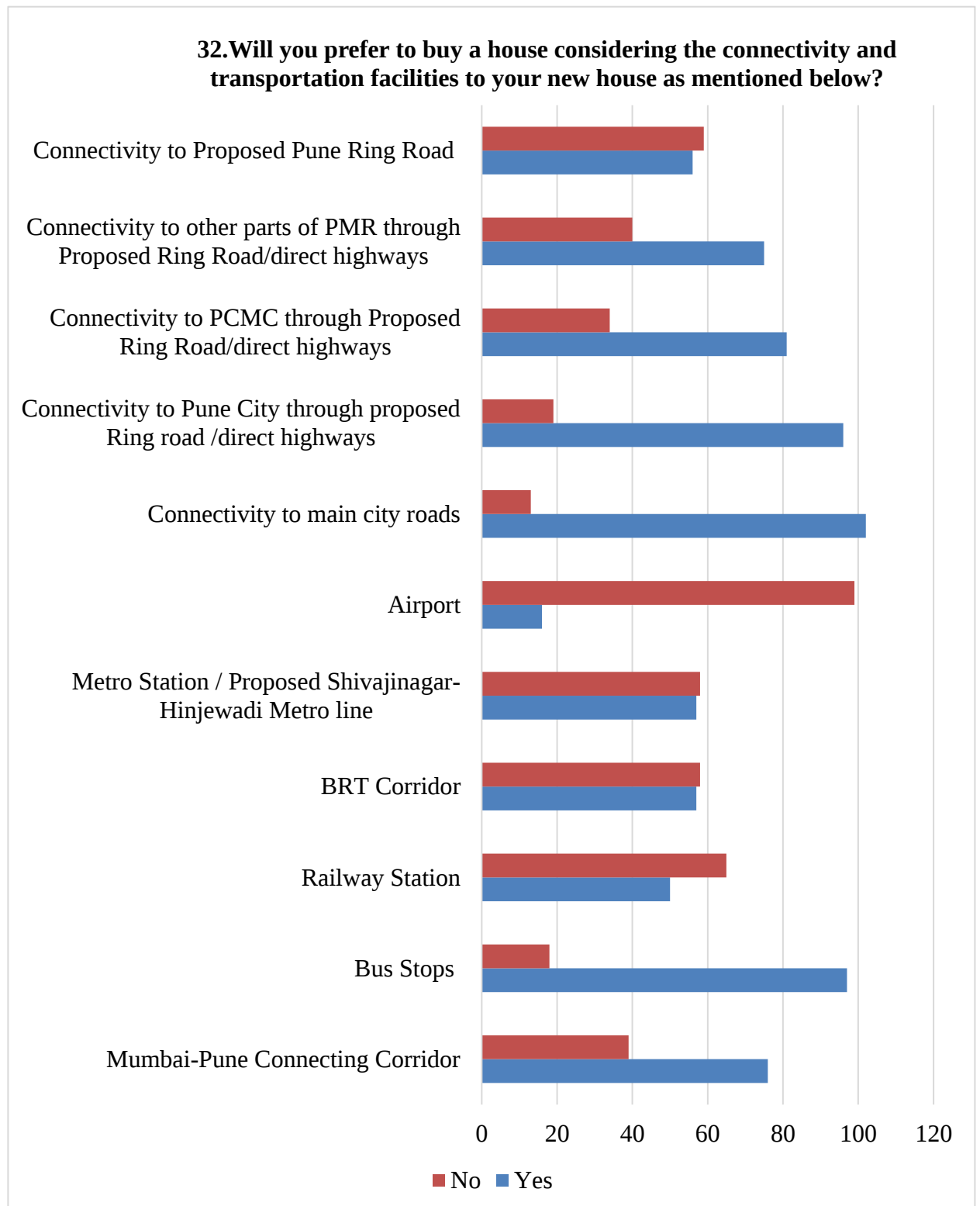


Figure 6.30 Type B - Connectivity and transportation facilities

Source: Prepared by Author

Findings from Descriptive Statistical Analysis (Figure 6.29 and Figure 6.30):

As shown in the above bar charts (Figure 6.29 and Figure 6.30) factors related to road connectivity i.e., road connectivity to main city road, PMC, PCMC, Mumbai-Pune corridor and other parts of PMR are preferred by more than 50% of home buyers. The most preferred connectivity is to the main city road (93.41%) followed by the road connectivity to PMC (87.82%), PCMC (81.03%) and other parts of PMR (77.23%). 71.65% of home buyers have preferred connectivity to Mumbai-Pune corridor. Considering the public transportation facilities 69.46% of home buyers have preferred connectivity to bus stops and 52.89% of home buyers have preferred connectivity to the BRT corridors. Connectivity to railway stations and airport is least preferred.

Type A (Home buyer who has bought a house in the last five years)

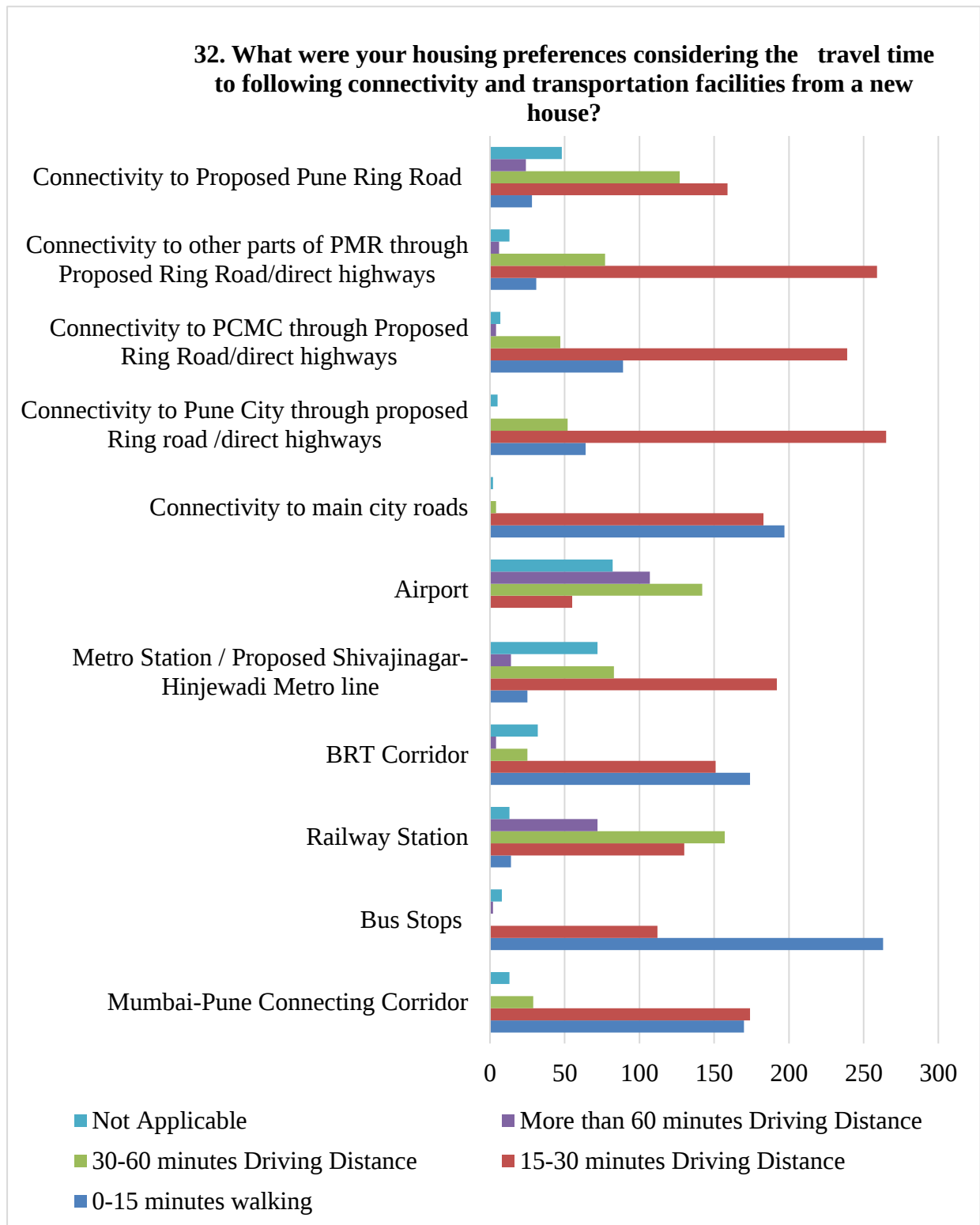


Figure 6.31 Type A - Proximity to Connectivity and transportation facilities

Source: Prepared by Author

Type B (Home buyer who is willing to buy a house in next five years)

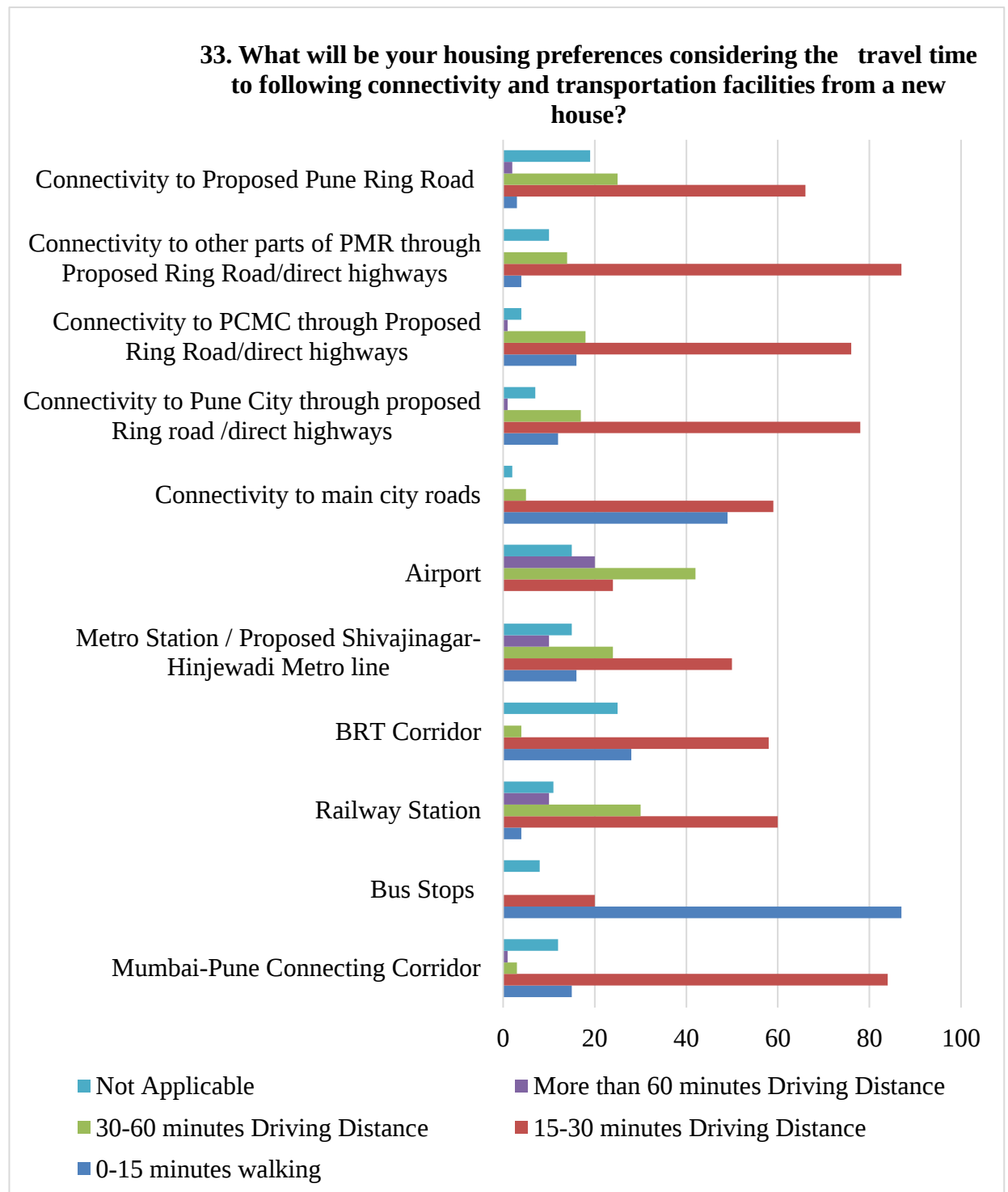


Figure 6.32 Type B - Proximity to Connectivity and transportation facilities

Source: Prepared by Author

Findings from Descriptive Statistical Analysis (Figure 6.31 and Figure 6.32):

As shown in the above bar charts (Figure 6.31 and Figure 6.32) more than 50% of home buyers have preferred to buy new houses considering the proximity of 15 minutes to 30 minutes driving distance to the connectivity and transportation facilities. Only 37.92% and 15.76% of home buyers have considered 15 minutes to 30 minutes driving distance from railway station and airport respectively. 69.86% of home buyers have preferred houses from which bus stops are located within 15 minutes walking distance.

6.1.4 Responses related to amenities, facilities and services

Type A (Home buyer who has bought a house in the last five years)

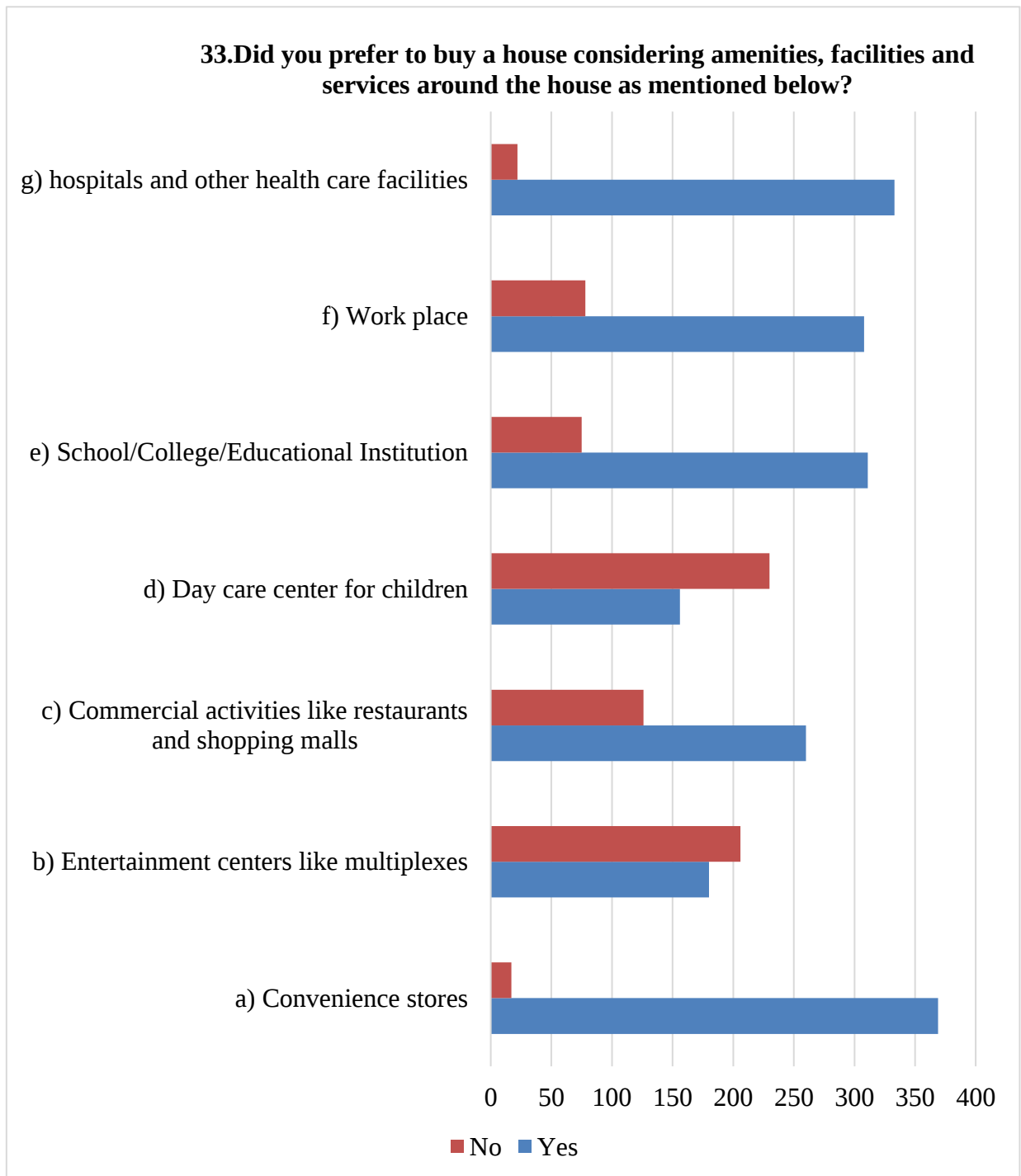


Figure 6.33 Type A - Amenities, facilities and services

Source: Prepared by Author

Type B (Home buyer who is willing to buy a house in the next five years)

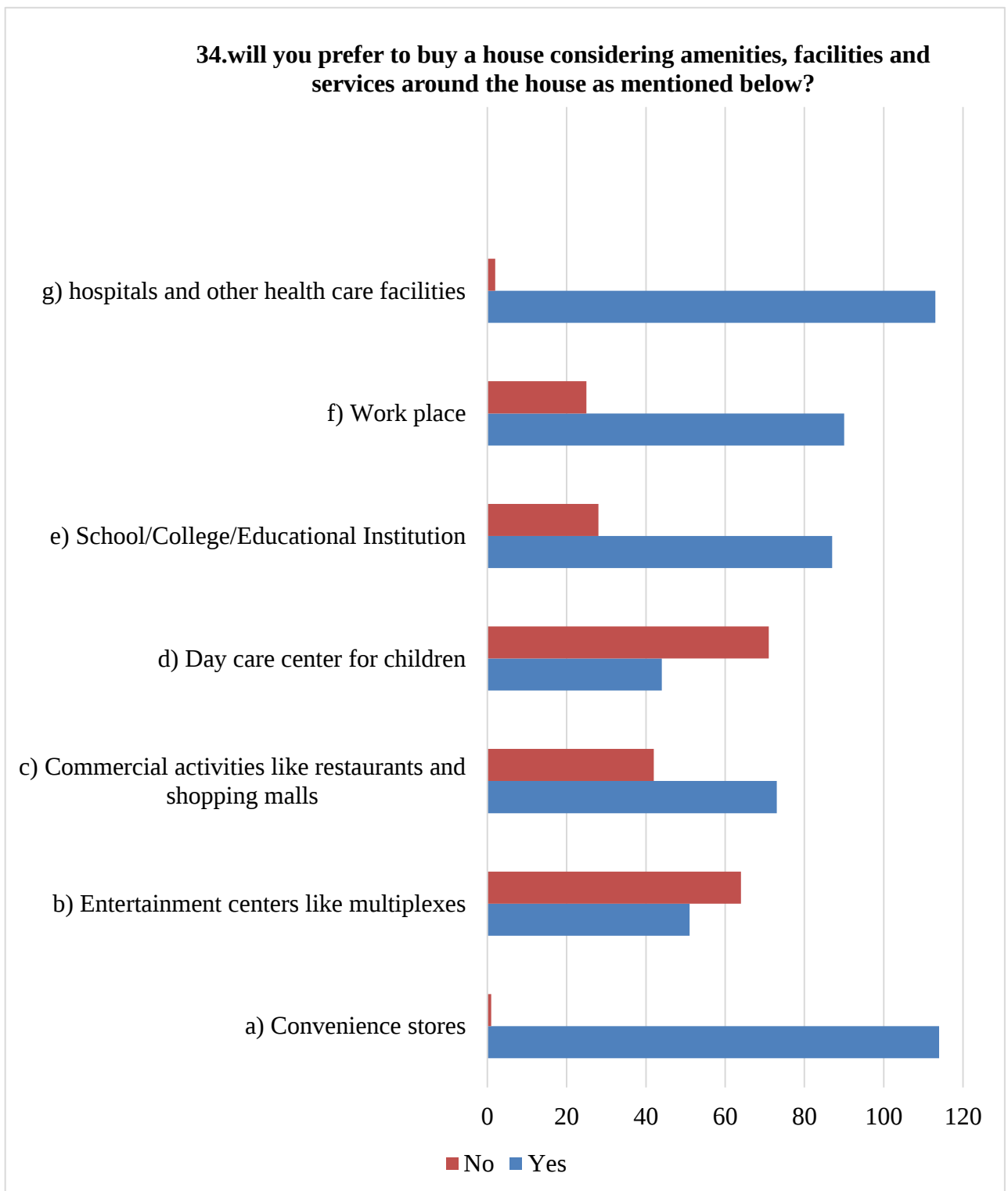


Figure 6.34 Type B - Amenities, facilities and services

Source: Prepared by Author

Findings from Descriptive Statistical Analysis (Figure 6.33 and Figure 6.34):

As shown in the above bar charts (Figure 6.33 and Figure 6.34) more than 50% of home buyers have preferred amenities, facilities and services of convenience stores, restaurants, shopping malls, schools, institutes, hospitals and health care facilities. The most preferred facilities are convenience store (93.90%) and workplace (80.48%) followed by schools/colleges/educational institutes (73.57%), hospitals and other healthcare facilities (71.95%).

Type A (Home buyer who has bought a house in the last five years)

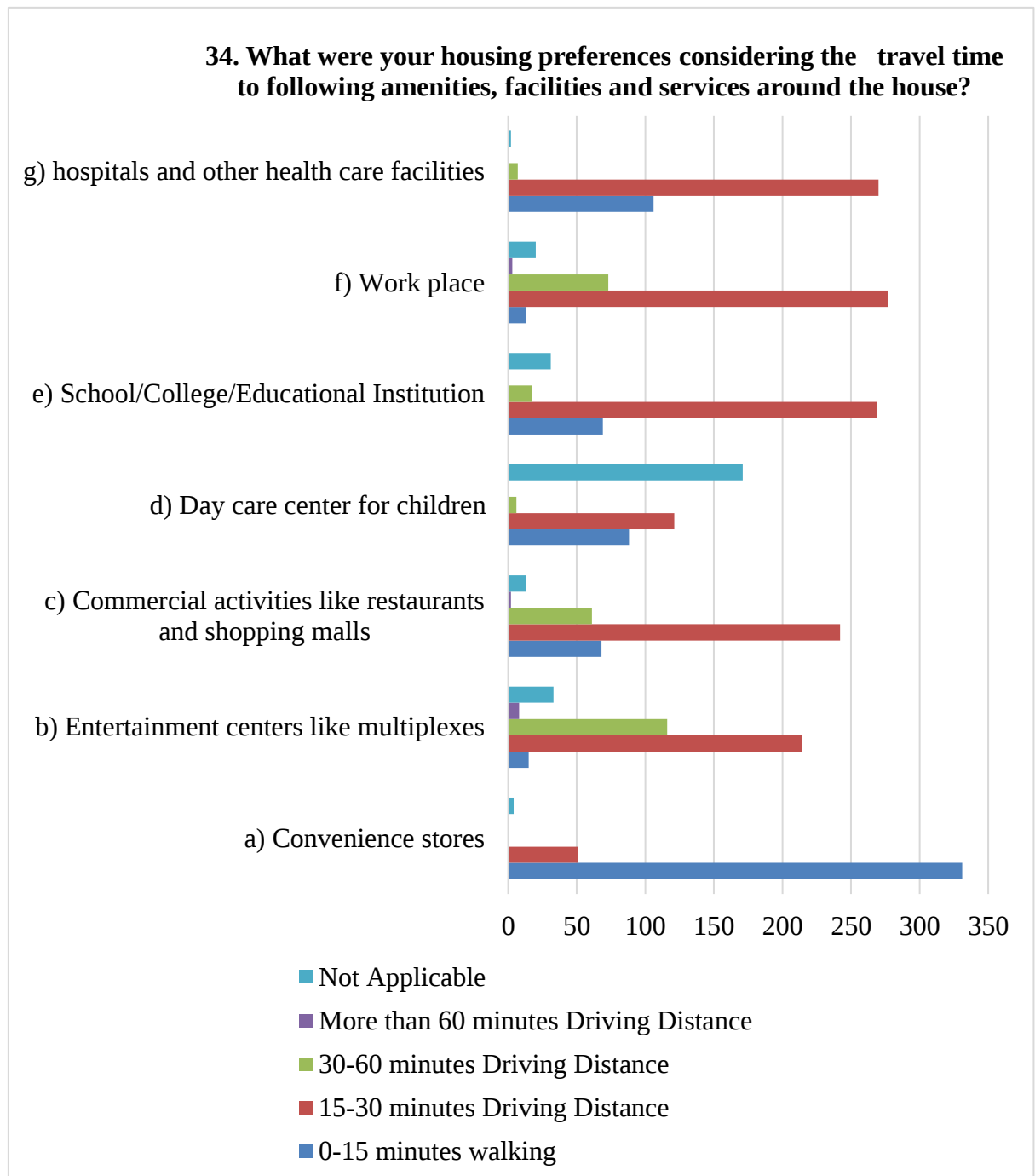


Figure 6.35 Type A - Proximity to Amenities, facilities and services

Source: Prepared by Author

Type B (Home buyer who is willing to buy a house in the next five years)

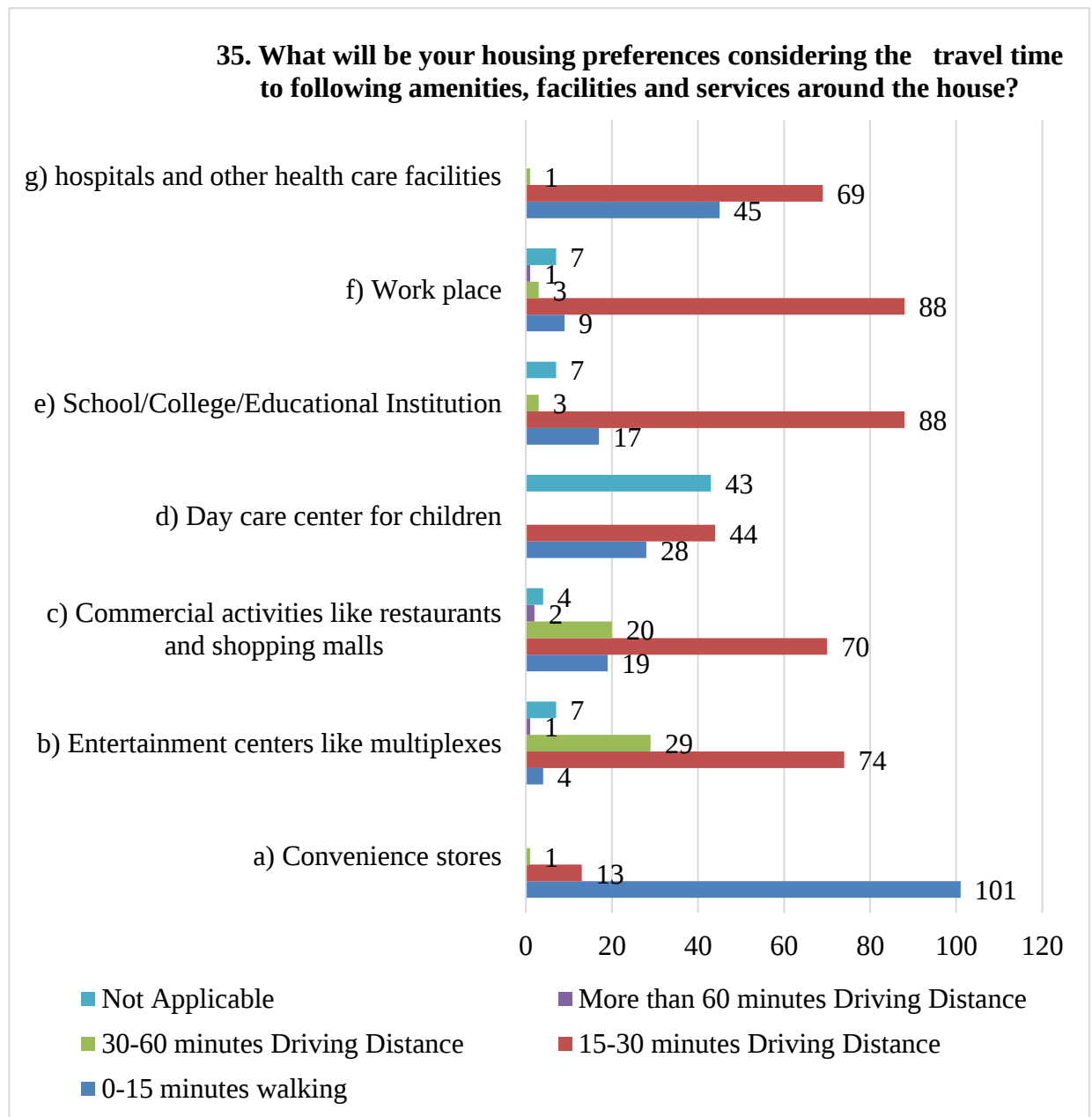


Figure 6.36 Type B - Proximity to Amenities, facilities and services

Source: Prepared by Author

Findings from Descriptive Statistical Analysis (Figure 6.35 and Figure 6.36):

As shown in the above bar charts (Figure 6.35 and Figure 6.36) more than 50% of home buyers have considered amenities and facilities available within the proximity of 15 to 30 minutes driving distance. Such facilities are Entertainment centers like multiplexes, restaurants, shopping malls, schools, institutes, hospitals and health care facilities, work place. Home buyers prefer proximity to convenience stores within 15 minutes walking distance while buying a new house. Proximity to the day care center for children is the least preferred factor by the home buyers.

6.1.5 Responses related to Architectural Design and planning of housing projects

Type A (Home buyer who has bought a house in the last five years)

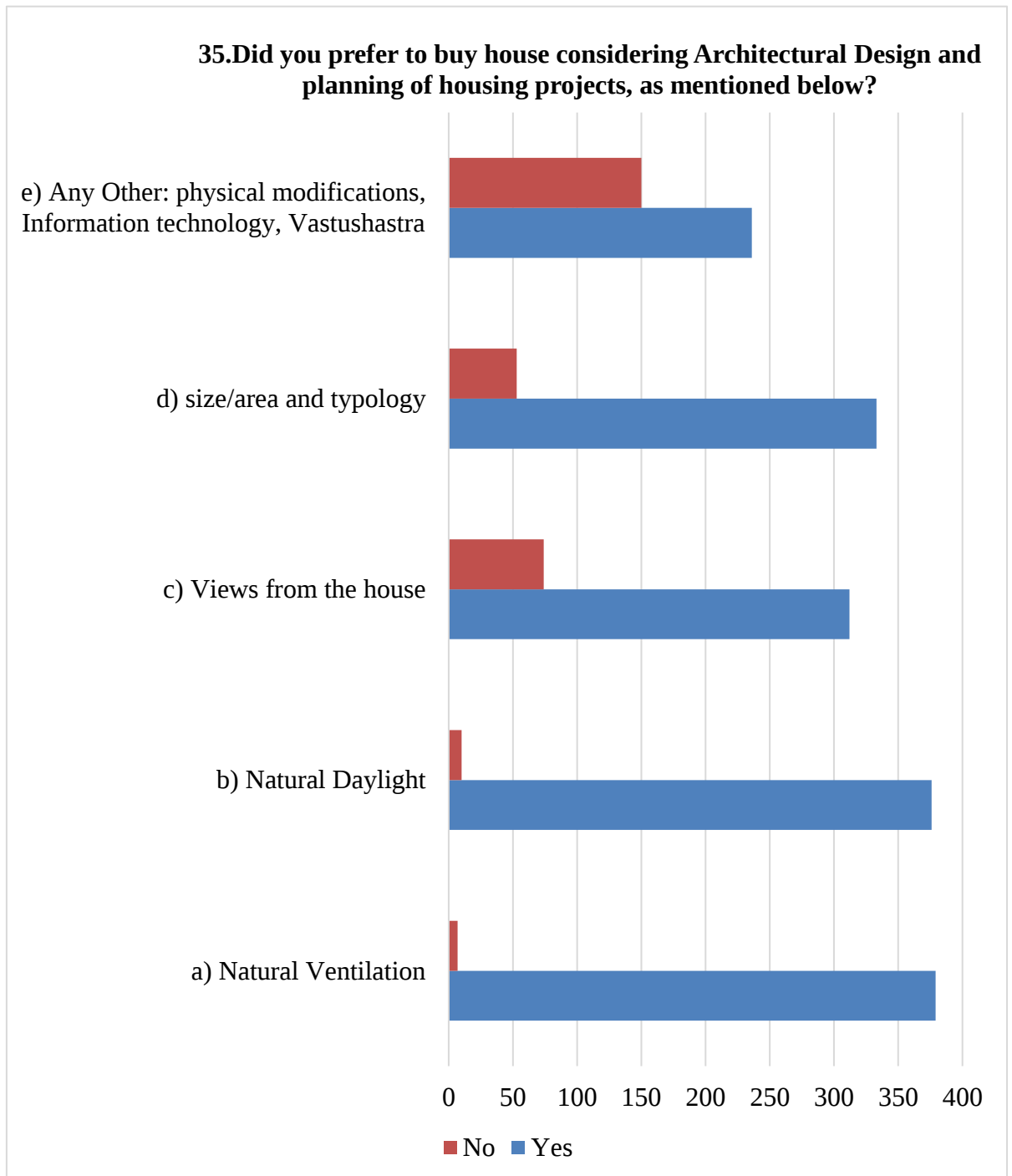


Figure 6.37 Type A - Architectural Design and Planning of housing projects

Source: Prepared by Author

Type B (Home buyer who is willing to buy a house in the next five years)

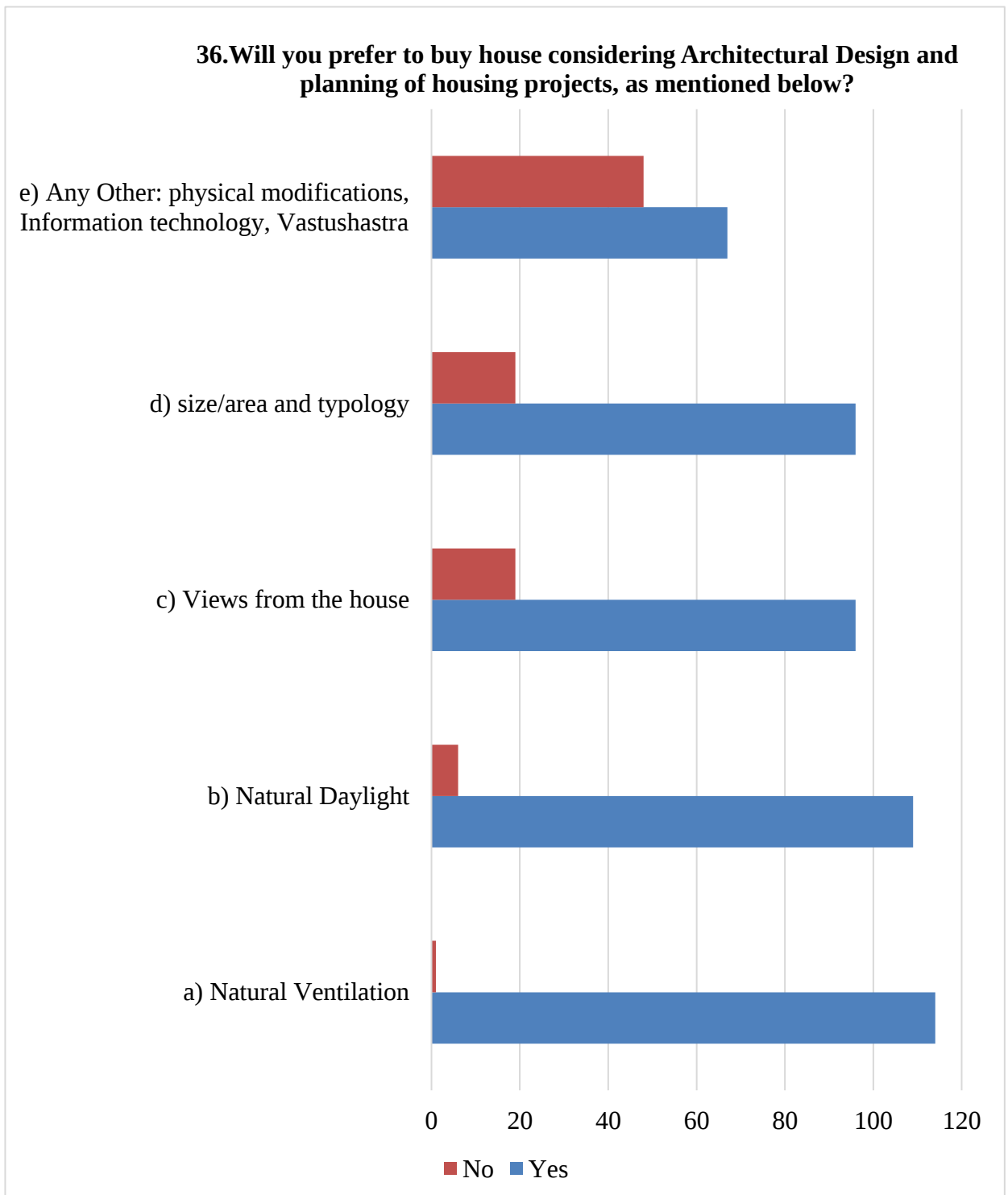


Figure 6.38 Type B - Architectural Design and Planning of housing projects

Source: Prepared by Author

Type A (Home buyer who has bought a house in the last five years)

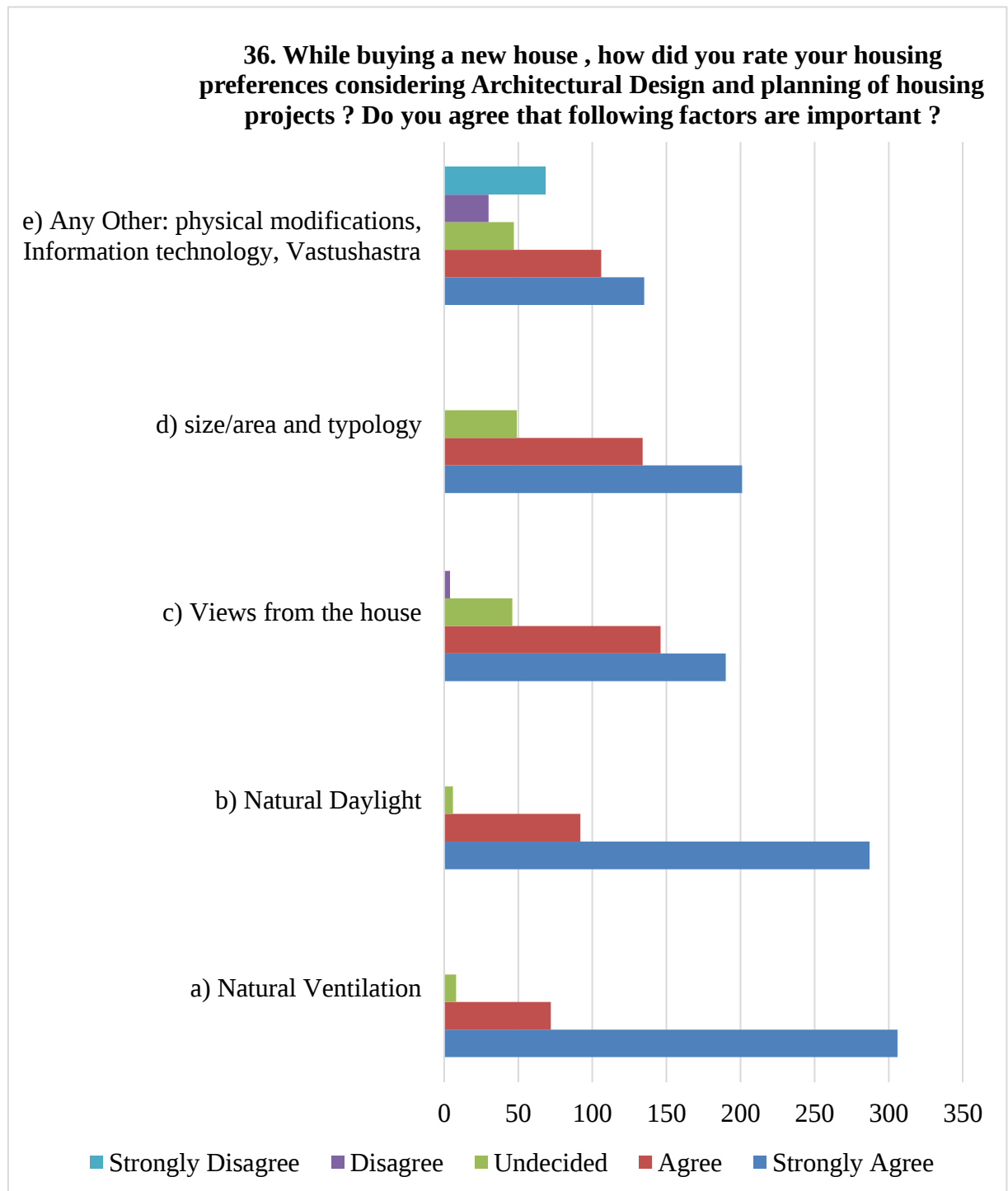


Figure 6.39 Type A - Architectural Design and Planning of housing projects

Source: Prepared by Author

Type B (Home buyer who is willing to buy a house in the next five years)

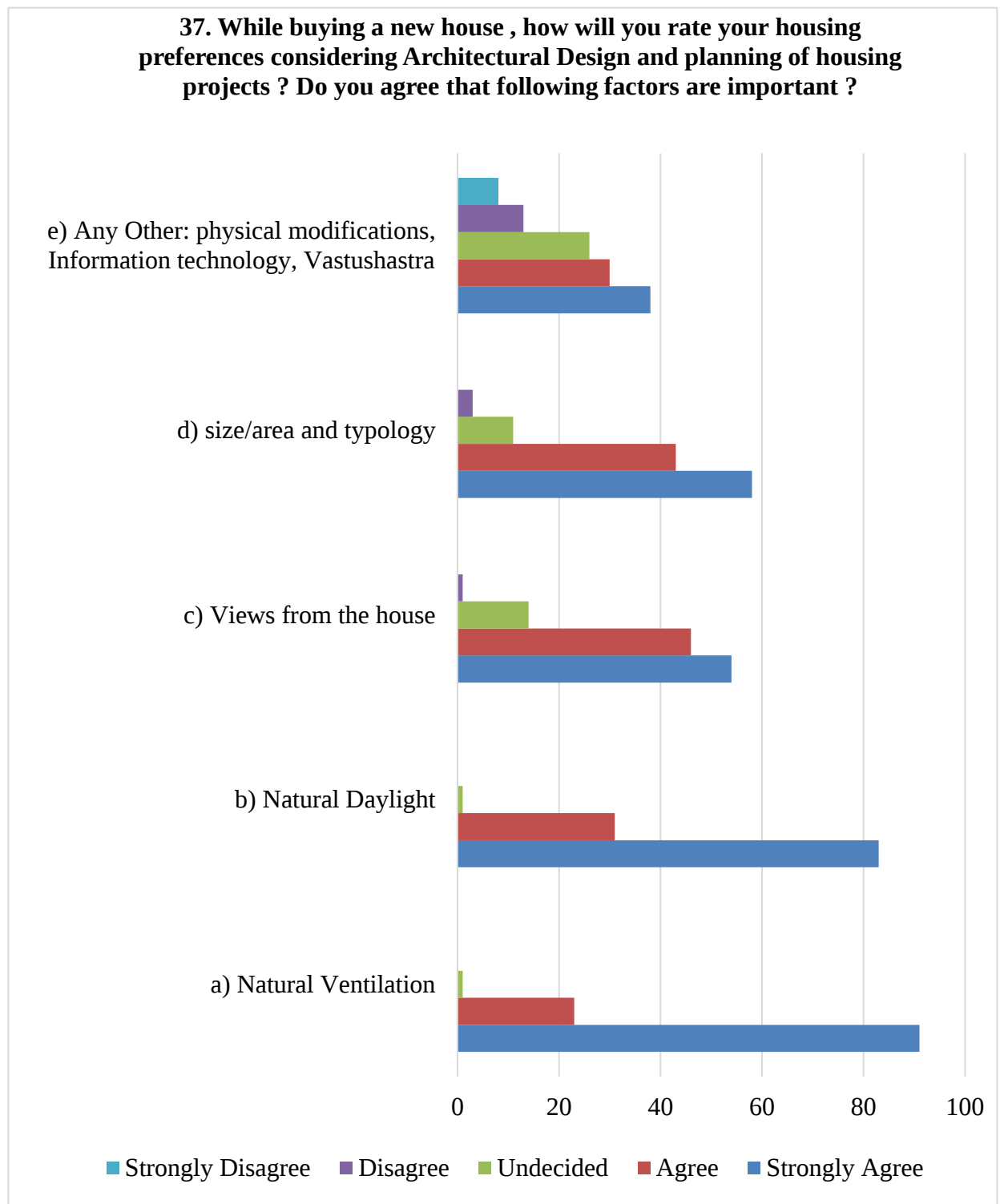


Figure 6.40 Type B - Architectural Design and Planning of housing projects

Source: Prepared by Author

Findings from Descriptive Statistical Analysis (Figure 6.37, Figure 6.38, Figure 6.39 and Figure 6.40):

As shown in the above bar charts (Figure 6.37, Figure 6.38, Figure 6.39 and Figure 6.40) more than 50% of home buyers are strongly agreed to consider factors related to Architectural Design and planning of the project which include natural ventilation, daylight, views from the house, size and typology of the house. Other factors such as vastushastra, Information Technology and scope for physical modifications are the least preferred factors by home buyers.

6.1.6 Responses related to Quality of residential environment and surroundings

Type A (Home buyer who has bought a house in the last five years)

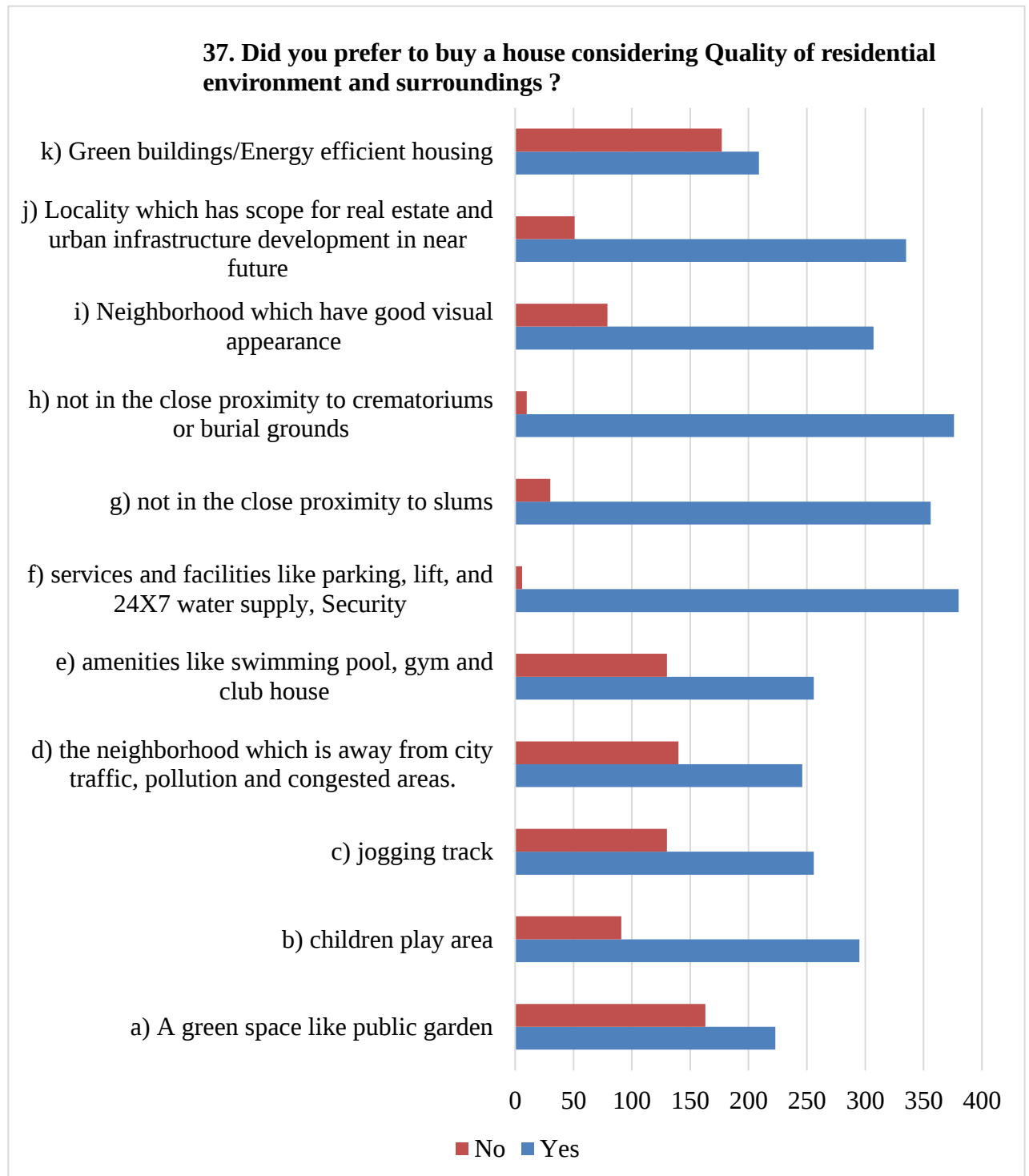


Figure 6.41 Type A - Quality of residential environment and surroundings

Source: Prepared by Author

Type B (Home buyer who is willing to buy a house in the next five years)

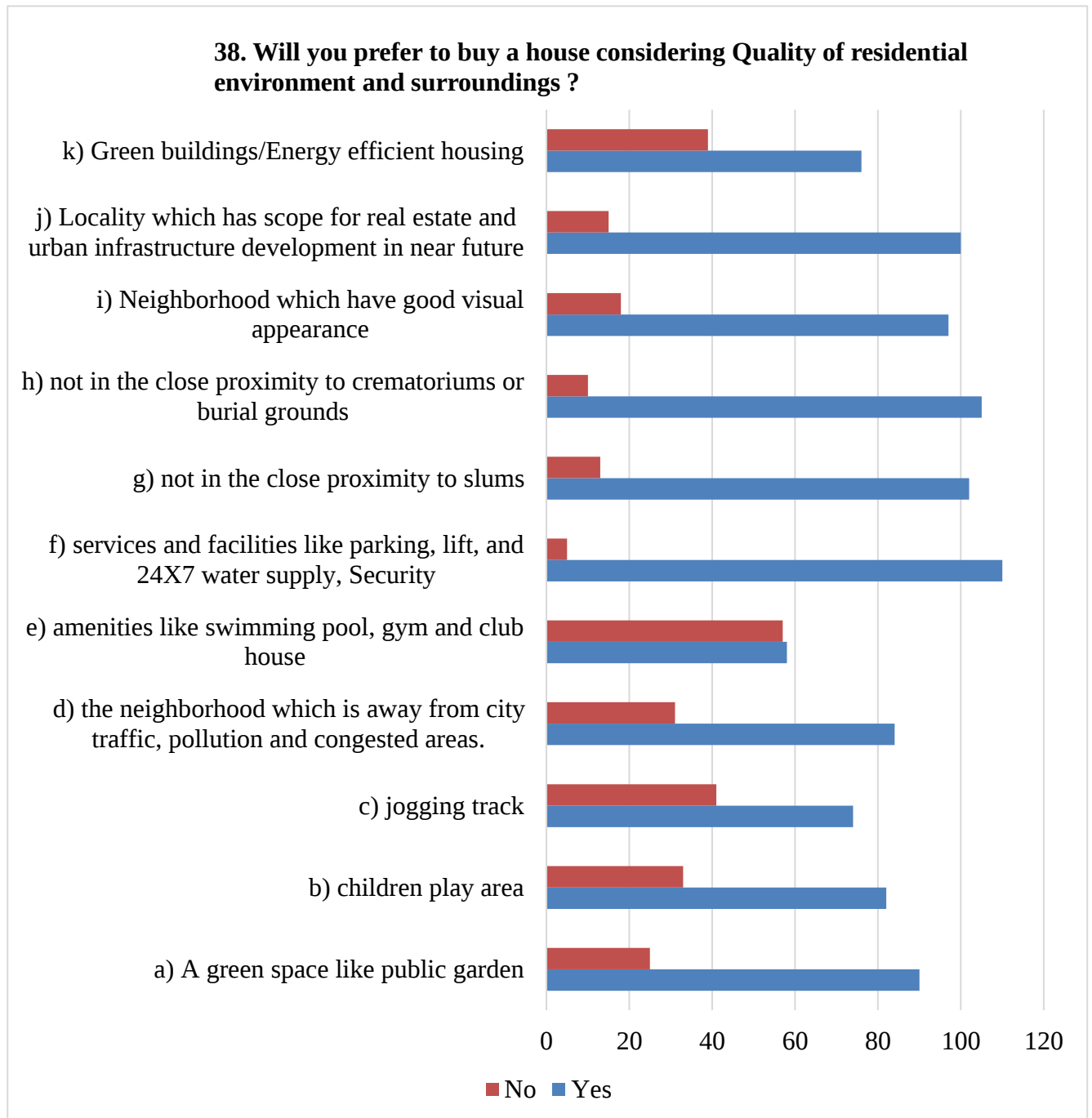


Figure 6.42 Type B - Quality of residential environment and surroundings

Source: Prepared by Author

Type A (Home buyer who has bought a house in the last five years)

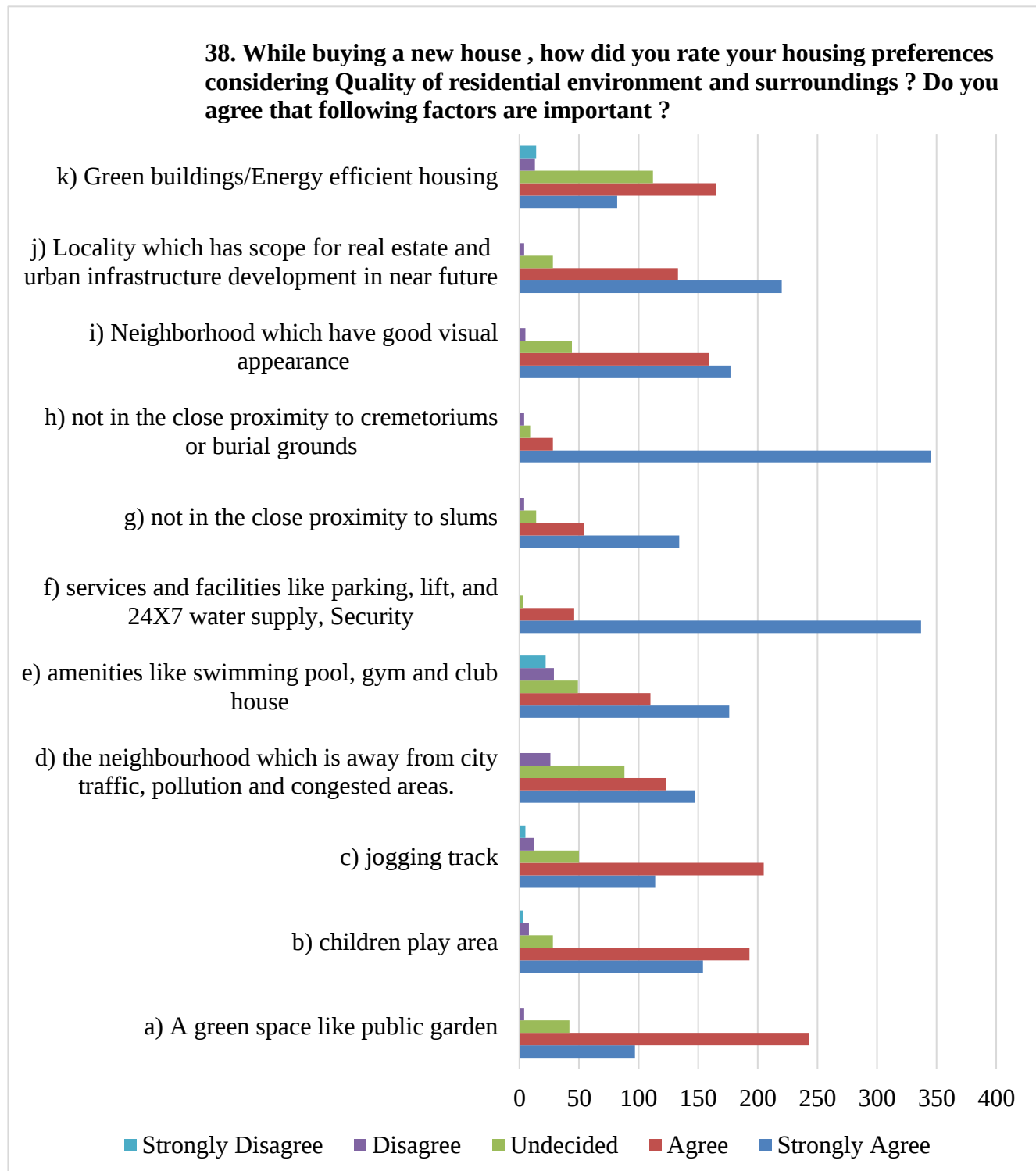


Figure 6.43 Type A - Quality of residential environment and surroundings

Source: Prepared by Author

Type B (Home buyer who is willing to buy a house in the next five years)

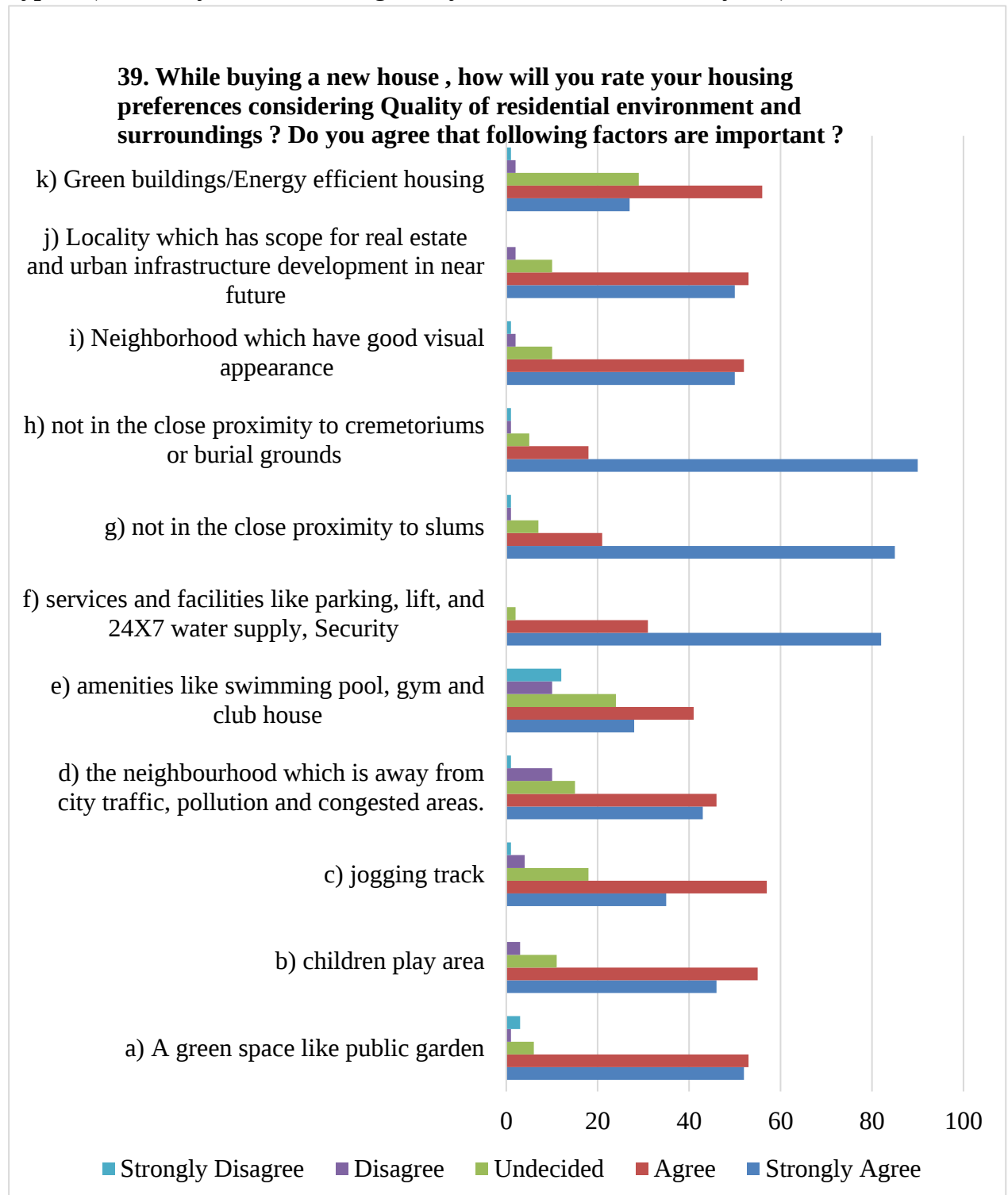


Figure 6.44 Type B - Quality of residential environment and surroundings

Source: Prepared by Author

Findings from Descriptive Statistical Analysis (Figure 6.41, Figure 6.42, Figure 6.43 and Figure 6.44):

As shown in the above bar charts (Figure 6.41, Figure 6.42, Figure 6.43 and Figure 5.44) more than 50% of home buyers are considering factors related quality of the residential environment and surroundings such as green space like a public garden, children play area, jogging track, services and facilities like parking, lift, 24 hours water supply, security, not in the close proximity to burial grounds, the neighborhood which has a good visual appearance, locality which has scope for real estate development and urban infrastructure.

6.1.7 Responses related to Social Aspects

Type A (Home buyer who has bought a house in the last five years)

39. Did you prefer to buy a house considering Social Aspects, as mentioned below ?

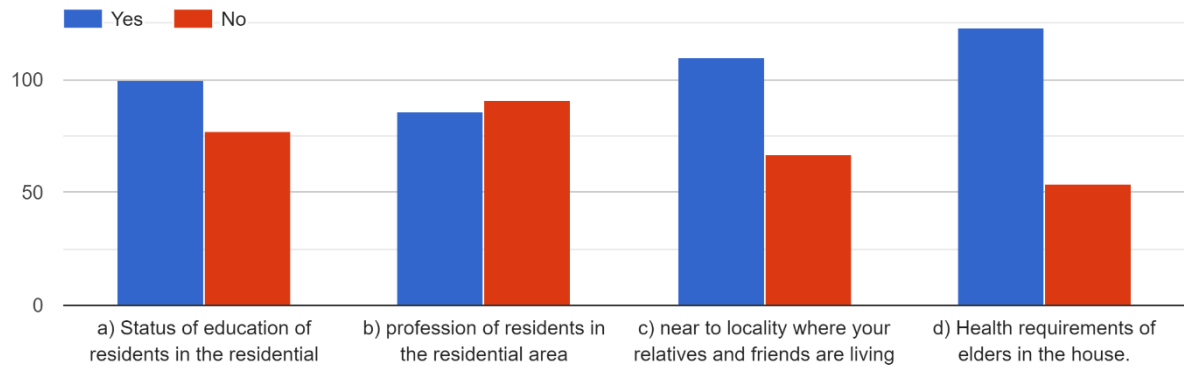


Figure 6.45 Type A - Social Aspects

Source: Google Forms Summary

Type B (Home buyer who is willing to buy a house in the next five years)

40. Will you prefer to buy a house considering Social Aspects, as mentioned below ?

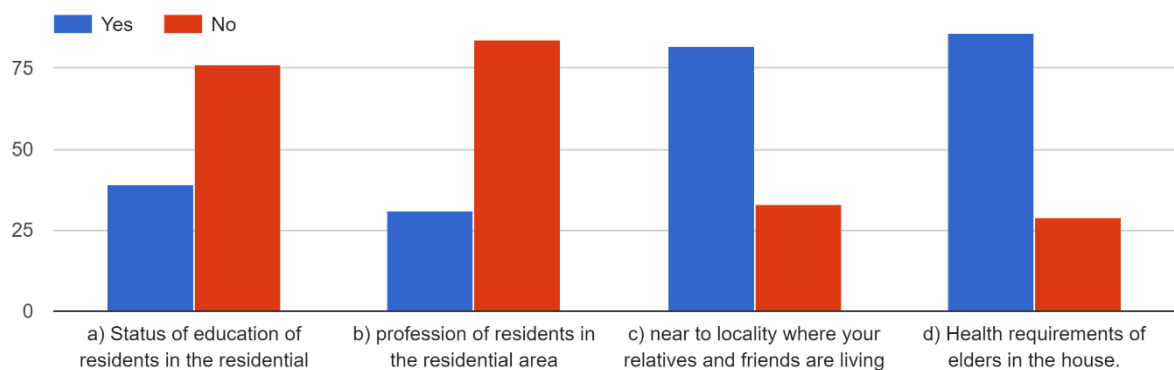


Figure 6.46 Type B - Social Aspects

Source: Google Forms Summary

Type A (Home buyer who has bought a house in the last five years)

40. What Status of education of residents in the residential area you preferred while buying a new house?

386 responses

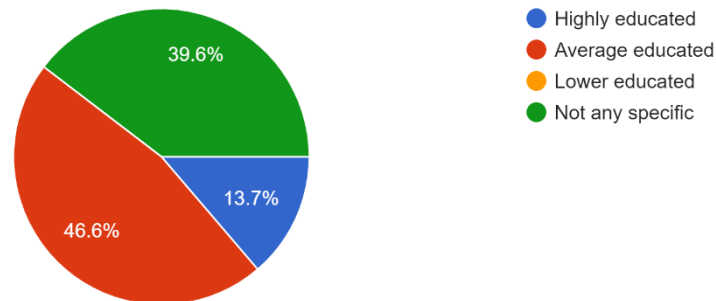


Figure 6.47 Type A - Social Aspects

Source: Google Forms Summary

Type B (Home buyer who is willing to buy a house in the next five years)

41. What Status of education of residents in the residential area will you prefer while buying a new house?

115 responses

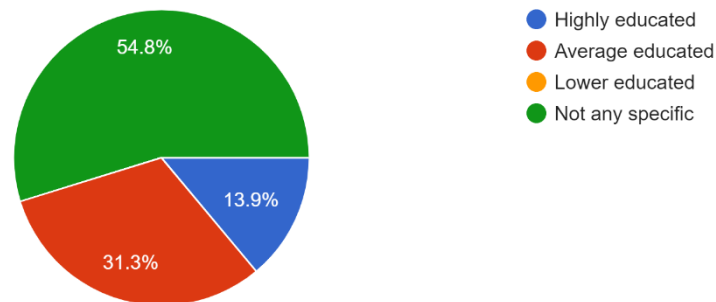


Figure 6.48 Type B - Social Aspects

Source: Google Forms Summary

Type A (Home buyer who has bought a house in the last five years)

41. What kind of profession of residents in the residential area you preferred, while buying a new house? (you can select more than one)

386 responses

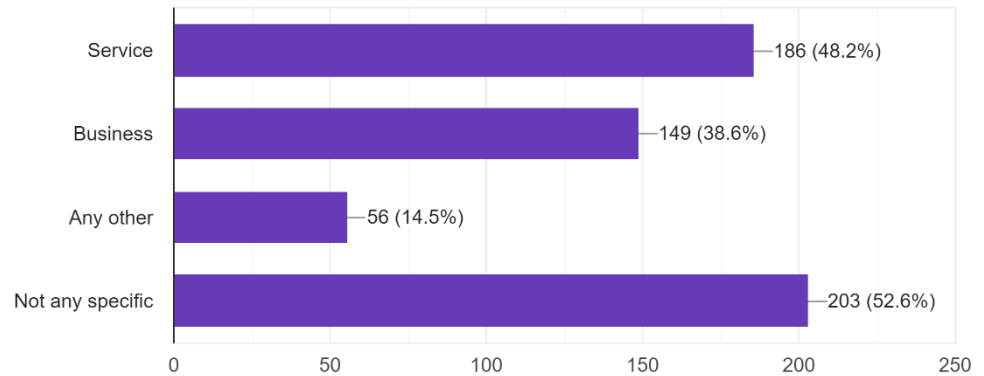


Figure 6.49 Type A - Social Aspects

Source: Google Forms Summary

Type B (Home buyer who is willing to buy a house in the next five years)

42. What kind of profession of residents in the residential area will you prefer, while buying a new house? (you can select more than one)

115 responses

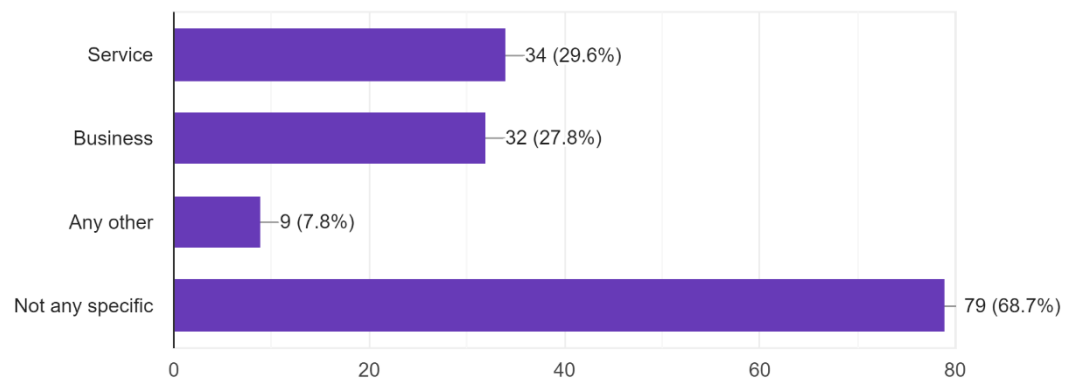


Figure 6.50 Type B - Social Aspects

Source: Google Forms Summary

Type A (Home buyer who has bought a house in the last five years)

42. How did you rate your preference to buy a house near to the locality where your relatives and friends are living?

386 responses

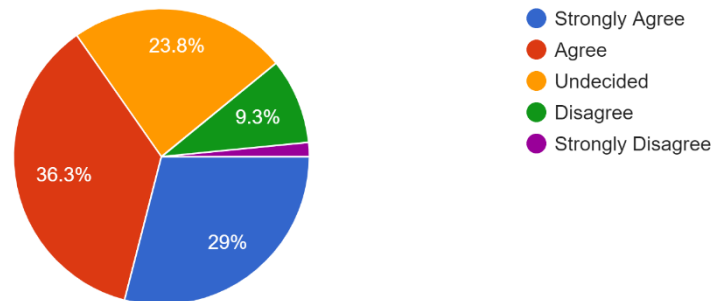


Figure 6.51 Type A - Social Aspects

Source: Google Forms Summary

Type B (Home buyer who is willing to buy a house in the next five years)

43. How will you rate your preference to buy a house near to the locality where your relatives and friends are living?

115 responses

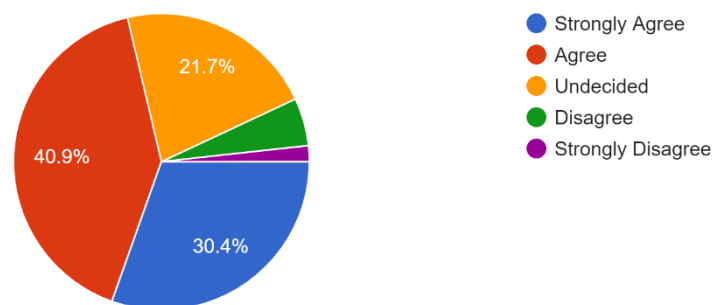


Figure 6.52 Type B - Social Aspects

Source: Google Forms Summary

Type A (Home buyer who has bought a house in the last five years)

43. What health care facilities did you want nearby your house? (you can select more than one)
386 responses

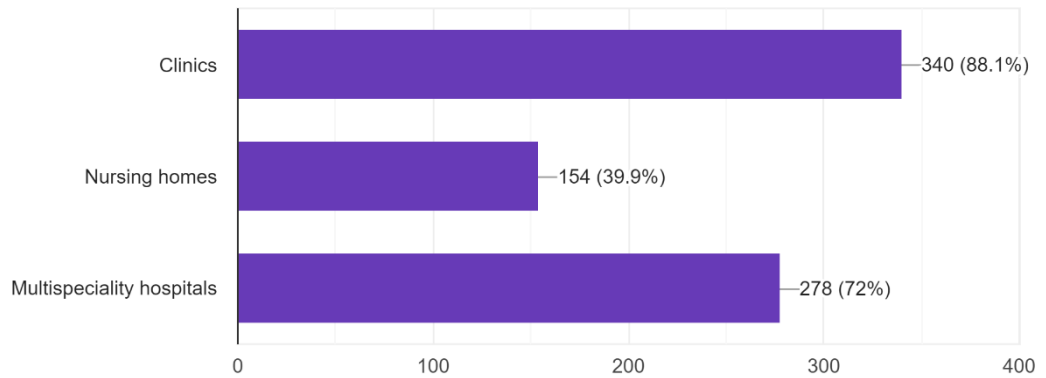


Figure 6.53 Type A - Health care facilities

Source: Google Forms Summary

Type B (Home buyer who is willing to buy a house in the next five years)

44. What health care facilities do you want nearby your new house? (you can select more than one)
115 responses

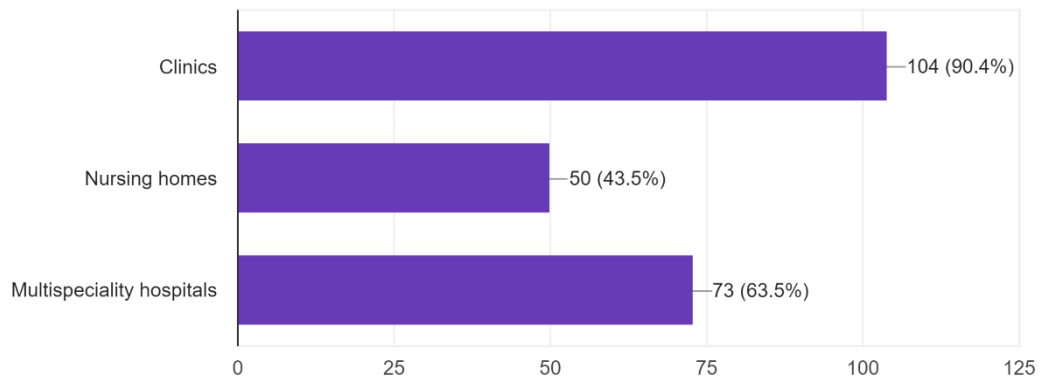


Figure 6.54 Type B - Health care facilities

Source: Google Forms Summary

Findings from Descriptive Statistical Analysis (Figure 6.45 and Figure 6.46):

As shown in Figure 6.45 and Figure 6.46, the Status of education of residences, the residential area near to locality where home buyer's relatives and friends are living and the health requirements of elders in the house are the most important factors considering the social aspects.

6.1.8 Summary of Descriptive Statistical Analysis

The most preferred housing costs are ranging from 41 lacs to 50 lacs. It is followed by housing costs ranging from 21 lacs to 30 lacs. The most preferred housing typology is 2bhk apartments followed by housing typology of 1bhk apartments. Home buyers have preferred to buy new houses of areas varying mainly from 401sq.ft to 800 sq. ft. Home buyers have preferred to buy new houses considering family size varying from 3 persons to 5 persons. 78.84% of home buyers have bought new houses considering their location factor. Factors related to road connectivity i.e., road connectivity to main city road, PMC, PCMC, Mumbai-Pune corridor and other parts of PMR are preferred by more than 50% of home buyers. Considering the public transportation facilities, connectivity to bus stops, BRT corridors and metro stations are the most preferred. Home buyers have preferred houses from where bus stops are located within 15 minutes walking distance. The most preferred facilities are convenience store and workplace, schools/colleges/educational institutes, hospitals and other healthcare facilities. Home buyers are strongly agreed to consider factors related to Architectural Design and planning of the project which include natural ventilation, daylight, views from the house, size and typology of the house. Home buyers are considering factors related to the quality of the residential environment and surroundings such as green space like public garden, children play area, jogging track, services and facilities like parking, lift, 24 hours water supply, security, not in close proximity to burial grounds, the neighborhood which has a good visual appearance, locality which has scope for real estate development and urban infrastructure. The social aspects such as status of education of residences, the residential area near to locality where home buyer's relatives and friends are living and Health requirements of elders in the house are the most important factors.

6.2 Binary Logistic Regression Analysis and hypotheses testing

This section discusses results of Binary Logistic Regression Analysis and hypotheses testing as follows:

6.2.1 Connectivity and transportation

H1: Home buyers prefer to buy houses considering 0-30 minutes driving distance from connectivity and transportation facilities.

(Null Hypothesis) NH1: Home buyers do not prefer to buy houses considering 0-30 minutes driving distance from connectivity and transportation facilities.

As shown in Table 6.1, for testing Hypothesis H1, dependent variables are the housing preferences related to connectivity and transportation and proximity of 0-30 minutes driving distance is the independent variable.

Table 6.1 Binary Logistic Regression Analysis for housing preferences related Connectivity and transportation

Dependent Variable (Housing Preferences)	Independent Variable	Binary Regression in SPSS			
		B	S.E.	Sig.	Exp (B)
Connectivity to Mumbai-Pune connecting corridor	0 – 30 minutes driving distance	3.742	.483	.000	42.162
Connectivity to BRT corridor	0 – 30 minutes driving distance	3.431	.471	.000	30.919
Connectivity to main city roads	0 – 30 minutes driving distance	2.875	.571	.000	17.731
Connectivity to Pune City through proposed Ring Road /direct highways	0 – 30 minutes driving distance	1.767	.292	.000	5.852
Connectivity to PCMC through	0 – 30 minutes driving distance	3.113	.286	.000	22.486

Proposed Ring Road/direct highways					
Connectivity to other parts of PMR through Proposed Ring Road/direct highways	0 – 30 minutes driving distance	2.292	.235	.000	9.895
Connectivity to Proposed Pune Ring Road	0 – 30 minutes driving distance	2.986	.240	.000	19.802
Metro station	0 – 30 minutes driving distance	3.383	.297	.000	29.473

Source: Prepared by Author

As shown in Table 6.1, the result of the hypothesis test for H1 is statistically significant hence it concludes that home buyers prefer to buy houses considering 0-30 minutes driving distance from connectivity and transportation facilities. H1 is accepted and NH1 is rejected (value of Sig. < 0.05). The factors which show the significant result (value of Sig. < 0.05) in terms of proximity within 0-30 minutes driving distance are connectivity to Mumbai-Pune connecting corridor, connectivity to BRT corridor, connectivity to main city roads, connectivity to Pune City (Pune Municipal Corporation), connectivity to PCMC (Pimpri Chinchwad Municipal Corporation), connectivity to other parts of PMR (such as IT hubs, industrial areas, etc.), connectivity to the proposed ring road and proposed metro stations. The coefficient for the constant value i.e., B interprets the change in the dependent variable with every increase in the number of independent variables. The B value of housing preference for connectivity to Mumbai-Pune corridor is 3.742 which is showing a positive significant association with proximity of 0-30 minutes driving distance. Also, compare to B values of all other factors of transportation and connectivity, B value for Mumbai-Pune Corridor is the highest one. Thus, it can be concluded that home buyers are more likely to prefer connectivity to Mumbai-Pune corridor in terms of proximity of 0-30 minutes driving

distance. It is followed by connectivity to BRT corridors, proposed metro stations and connectivity to PCMC. The B value for connectivity to Pune city is 1.767 which the lowest one so even though connectivity to Pune city is one of the important factors, home buyers are less likely to prefer it over other housing preferences.

H2: Home buyers prefer houses where the bus stop is located within 15 minutes walking distance from the house.

(Null Hypothesis) NH2: Home buyers do not prefer houses where the bus stop is located within 15 minutes walking distance from the house.

As shown in Table 6.2, for testing Hypothesis H2, housing preference for a Bus stop is the dependent variable and proximity of 0-15 minutes walking distance is the independent variable.

Table 6.2 Binary Logistic Regression Analysis for housing preferences related Connectivity and transportation

Dependent Variable (Housing Preferences)	Independent Variable	Binary Regression in SPSS			
		B	S.E.	Sig.	Exp (B)
Bus Stops	0-15 minutes walking distance	2.640	.234	.000	14.009

Source: Prepared by Author

As shown in Table 6.2, the result of Hypothesis H2 is statistically significant (value of Sig. < 0.05). H2 is accepted and NH2 is rejected. Hence, home buyers are more likely to prefer houses where the bus stop is located within 15 minutes walking distance from the house.

As shown in Table 6.3, for further analysis, housing preferences related to connectivity and transportation are dependent variables and income groups of home buyers are independent variables.

Table 6.3 Binary Logistic Regression Analysis for housing preferences related Connectivity and transportation

Dependent Variable	Independent variables	Binary Regression Analysis in SPSS			
		B	S.E.	Sig.	Exp (B)
Connectivity to Mumbai-Pune connecting corridor	Income 1 lac to 5 lacs	-.571	.243	.019	.565
	Income 6 lacs to10 lacs	.715	.201	.019	.565
	Income 11 lacs to15 lacs	-.393	.256	.000	2.045
	Income more than 15 lacs	-.123	.437	.778	.884
Connectivity to BRT corridor	Income 1 lac to 5 lacs	-.659	.236	.005	.517
	Income 6 lacs to10 lacs	.837	.186	.000	2.309
	Income 11 lacs to15 lacs	-.733	.248	.003	.481
	Income more than 15 lacs	.205	.407	.615	1.227
Connectivity to main city roads	Income 1 lac to 5 lacs	-.208	.443	.639	.813
	Income 6 lacs to10 lacs	.356	.361	.325	1.427
	Income 11 lacs to15 lacs	-.136	.468	.771	.872

	Income more than 15 lacs	-.177	.759	.816	.838
Connectivity to PMC	Income 1 lac to 5 lacs	-.446	.323	.167	.640
	Income 6 lacs to10 lacs	.486	.274	.076	1.626
	Income 11 lacs to15 lacs	-.376	.339	.076	1.626
	Income more than 15 lacs	.532	.749	.478	1.702
Connectivity to PCMC	Income 1 lac to 5 lacs	-1.027	.260	.000	.358
	Income 6 lacs to10 lacs	.993	.234	.000	2.700
	Income 11 lacs to15 lacs	.053	.312	.866	1.054
	Income more than 15 lacs	-.873	.429	.042	.418
Connectivity to other parts of PMR	Income 1 lac to 5 lacs	-.354	.244	.147	.702
	Income 6 lacs to10 lacs	.178	.198	.369	1.195
	Income 11 lacs to15 lacs	.182	.271	.502	1.200
	Income more than 15 lacs	-.041	.437	.924	.959
Connectivity to ring road	Income 1 lac to 5 lacs	-.068	.235	.773	.934
	Income 6 lacs to10 lacs	-.031	.184	.867	.970

	Income 11 lacs to 15 lacs	.156	.243	.519	1.169
	Income more than 15 lacs	.130	.404	.748	1.139
Connectivity to metro station	Income 1 lac to 5 lacs	-.671	.252	.008	.511
	Income 6 lacs to 10 lacs	.560	.189	.003	1.750
	Income 11 lacs to 15 lacs	-.165	.248	.505	.848
	Income more than 15 lacs	-.117	.414	.778	.890
Bus stop	Income 1 lac to 5 lacs	1.467	.351	.000	4.338
	Income 6 lacs to 10 lacs	.012	.198	.951	1.012
	Income 11 lacs to 15 lacs	-.886	.247	.000	.412
	Income more than 15 lacs	-.542	.409	.185	.581

Source: Prepared by Author

Table 6.3 shows that home buyers from income group 6 lacs to 10 lacs are more likely to consider connectivity to Mumbai-Pune corridor, BRT corridor, connectivity to PCMC and metro station. Whereas, home buyers from income group 1 lac to 5 lacs are more likely to prefer connectivity to Bus stop.

6.2.2 Proximity to amenities, facilities and services

H3: home buyers consider amenities and facilities available within the proximity of 0 to 30 minutes driving distance.

(Null Hypothesis) NH3: home buyers do not consider amenities and facilities available within the proximity of 0 to 30 minutes driving distance.

As shown in Table 6.4, for testing Hypothesis H3, housing preferences related to amenities, facilities and services are dependent variables and proximity of 0-30 minutes driving distance is the independent variable.

Table 6.4 Binary Logistic Regression Analysis for housing preferences related Proximity to amenities, facilities and services

Dependent Variable (Housing Preferences)	Independent Variable	Binary Regression in SPSS			
		B	S.E.	Sig.	Exp (B)
Commercial activities like restaurants and shopping malls	0 – 30 minutes driving distance	2.958	.287	.000	19.250
School/College/Educational Institution	0 – 30 minutes driving distance	3.178	.354	.000	23.989
Workplace	0 – 30 minutes driving distance	.599	.247	.015	1.820
hospitals and other health care facilities	0 – 30 minutes driving distance	3.449	.651	.000	31.467
Entertainment centers like multiplexes	0 – 30 minutes driving distance	1.894	.214	.000	6.643

Source: Prepared by Author

Table 6.4 shows the result of Hypothesis H3, which is statistically significant (value of Sig. < 0.05). H3 is accepted and NH3 is rejected. Home buyers have considered amenities, facilities and services available within the proximity of 0 to 30 minutes driving

distance. Such amenities are commercial activities like restaurants and shopping malls, School/College/Educational Institutions, workplace and health care facilities and entertainment centers like multiplexes. The B value for health care facilities is 3.449 which is the highest one and then the second highest B value is 3.178 for School/College/Educational Institutions. Thus, in terms of proximity of 0-30 minutes driving distance home buyers are more likely to prefer health care facilities and amenity of School/College/Educational Institutions. Then it is followed by a preference for commercial activities like restaurants and shopping malls. B value for Entertainment centers like multiplexes is 1.894 and for workplace it is 0. 599. So in terms of proximity home buyers are less likely to prefer workplace and entertainment centers within 0-30 minutes driving distance from their new homes.

H4: Home buyers prefer houses where proximity to convenience stores is within 15 minutes walking distance while buying a new house.

(Null Hypothesis) NH4: Home buyers do not prefer houses where proximity to convenience stores is within 15 minutes walking distance while buying a new house.

As shown in Table 6.5, for testing Hypothesis H4, housing preference for Convenience stores is the dependent variable and proximity of 0-15 minutes walking distance is the independent variable.

Table 6.5 Binary Logistic Regression Analysis for housing preferences related Proximity to amenities, facilities and services

Dependent Variable (Housing Preferences)	Independent Variable	Binary Regression in SPSS			
		B	S.E.	Sig.	Exp (B)
Convenience stores	0-15 minutes walking distance	2.444	.503	.000	11.515

Source: Prepared by Author

As shown in Table 6.5, the result of Hypothesis H5 is statistically significant (value of Sig. < 0.05). H4 is accepted and NH4 is rejected. Home buyers prefer houses where proximity to convenience stores is within 15 minutes walking distance while buying a new house.

As shown in Table 6.6, for further analysis, housing preferences related to amenities, facilities and services are the dependent variables and factors such as economic groups and demographic characteristics of home buyers are the independent variables.

Table 6.6 Binary Logistic Regression Analysis for housing preferences related Proximity to amenities, facilities and services

Dependent Variable	Independent variables	Binary Regression Analysis in SPSS			
		B	S.E.	Sig.	Exp (B)
Commercial activities like restaurants and shopping malls	Income 1 lac to 5 lacs	-.881	.236	.000	.414
	Income 6 lacs to 10 lacs	.379	.192	.048	1.461
	Income 11 lacs to 15 lacs	.306	.266	.251	1.358
	Income more than 15 lacs	.134	.436	.759	1.143
	House price 61 lacs to 70 lacs	1.135	.494	.022	3.110
School/colleges/Institutions	Income 1 lac to 5 lacs	-.406	.269	.131	.666

	Income 6 lacs to10 lacs	.473	.223	.034	1.604
	Income 11 lacs to15 lacs	-.100	.293	.733	.905
	Income more than 15 lacs	-.575	.440	.191	.563
	Families with preschool and school going children	1.372	.244	.000	3.943
Workplace	Income 1 lac to 5 lacs	-.617	.262	.019	.539
	Income 6 lacs to10 lacs	.572	.223	.010	1.771
	Income 11 lacs to15 lacs	.078	.304	.798	1.081
	Income more than 15 lacs	-.764	.428	.074	.466
	Occupation service	.872	.244	.000	2.392
	House price 41 lacs to 50 lacs	.464	.226	.040	1.591
hospitals and other health care facilities	Income 1 lac to 5 lacs	-.430	.486	.377	.651
	Income 6 lacs to10 lacs	.766	.425	.071	2.152
	Income 11 lacs to15 lacs	-.565	.488	.247	.569
	Income more than 15 lacs	.241	1.042	.817	1.272
Convenience stores	Income 1 lac to 5 lacs	-.263	.579	.650	.769

	Income 6 lacs to 10 lacs	-.062	.492	.900	.940
	Income 11 lacs to 15 lacs	.463	.760	.543	1.588
	Income more than 15 lacs	-.075	1.049	.943	.928

Source: Prepared by Author

Table 6.6 shows that home buyers from income group 6 lacs to 10 lacs are more likely to prefer factors such as restaurants, shopping malls, schools and workplace. Considering the proximity to restaurants and shopping mall, home buyers can prefer the housing prices 61 lacs to 70 lacs. Families with preschool-going and school-going children are more likely to prefer proximity to schools. Whereas home buyers from service class are more likely to prefer to buy houses near workplace for house prices 41 lacs to 50 lacs.

6.2.3 Economy

In Table 6.7, Table 6.8 and Table 6.9, Binary Logistic Regression is applied to factors related to economy. Here, Housing typologies are the dependent variables and economic factors such as income groups, areas of the house, housing price and demographic characteristics such as a phase of the family life cycle, family size, occupation, age of home buyer are the independent variables.

Table 6.7 Binary Logistic Regression Analysis for housing preferences related Housing Typology and economy

Dependent Variable	Independent variables	Binary Regression Analysis in SPSS			
		B	S.E.	Sig.	Exp (B)
1BHK	Income 1 lac to 5 lacs	2.586	.266	.000	13.275

	Income 6 lacs to 10 lacs	-.962	.221	.000	.382
	Income 11 lacs to 15 lacs	-2.188	.599	.000	.112
	Income more than 15 lacs	-1.250	.744	.093	.287
	Occupation service	-.283	.252	.262	.753
	Occupation Business	.209	.311	.501	1.233
	Area 401 sq. ft to 500 sq. ft	3.481	.407	.000	32.492
	Area 501 sq. ft to 600 sq. ft	2.143	.314	.000	8.524
	Area 601 sq. ft to 700 sq. ft	-1.247	.272	.000	.287
	Area 701 sq. ft to 800 sq. ft	-2.439	.597	.000	.087
	Area 801 sq. ft to 900 sq. ft	-19.989	8038.594	.998	.000
	Area 901 sq. ft to 1000 sq. ft	-2.117	1.024	.039	.120
	Area 1001 sq. ft and above	-20.025	6520.161	.998	.000
	Phase of life cycle – unattached adult	.856	.288	.003	2.353
	House price 11 lacs to 20 lacs	3.200	.556	.000	24.529
	House price 21 lacs to 30 lacs	3.336	.298	.000	28.107
	House price 31 lacs to 40 lacs	.157	.399	.694	1.170
	House price 41 lacs to 50 lacs	-3.424	.469	.000	.033
	House price 51 lacs to 60 lacs	-2.227	1.022	.029	.108

	House price 61 lacs to 70 lacs	-20.014	6893.038	.998	.000
	House price 71 lacs to 80 lacs	-19.981	8569.170	.998	.000
	House price above 80 lacs	-1.137	1.050	.279	.321
	Family size –Two persons	1.242	.384	.001	3.463
	Family size –Three persons	1.557	.243	.000	4.745

Source: Prepared by Author

Table 6.7, Table 6.8 and Table 6.9 show variables related to Economy factors that affect housing preferences. Housing preferences are dependent on economic factors such as housing typology, area of the house, family income, family size, house price and occupation. As shown in the Table 6.7 home buyers from income group 1 lac to 5lacs are more likely to buy 1BHK apartments for housing costs varying from 11 lacs to 30 lacs. Home buyers are more likely to prefer a house area varying from 401 sq. ft to 600 sq. ft. for 1BHK apartments. Unattached adults and families with two to three persons are more likely to buy 1BHK apartments. Considering the B value of 3.481, the factor of house area 401 sq. ft to 500 sq. ft shows the strongest positive relationship with the housing preference for 1BHK apartment. It is followed by house price 21 lacs to 30 lacs and house price 11 lacs to 20 lacs.

Table 6.8 Binary Logistic Regression Analysis for housing preferences related Housing Typology and economy

Dependent Variable	Independent variables	Binary Regression Analysis in SPSS			
		B	S.E.	Sig.	Exp (B)
2BHK	Income 1 lac to 5 lacs	-2.531	.287	.000	.080
	Income 6 lacs to 10 lacs	1.313	.197	.000	3.716

	Income 11 lacs to 15 lacs	.736	.285	.010	2.088
	Income more than 15 lacs	-.677	.404	.094	.508
	Occupation service	1.365	.331	.000	3.917
	Occupation Business	-.888	.271	.001	.412
	Area 401 sq. ft to 500 sq. ft	-4.475	.731	.000	.011
	Area 501 sq. ft to 600 sq. ft	-1.978	.319	.000	.138
	Area 601 sq. ft to 700 sq. ft	1.730	.243	.000	5.638
	Area 701 sq. ft to 800 sq. ft	2.069	.382	.000	7.919
	Area 801 sq. ft to 900 sq. ft	-.761	.412	.065	.467
	Area 901 sq. ft to 1000 sq. ft	1.585	.617	.010	4.879
	Area 1001 sq. ft and above	-1.815	.382	.000	.163
	Families with preschool and school going children	.551	.190	.004	1.735
	House price 11 lacs to 20 lacs	-3.218	1.133	.004	.040

	House price 21 lacs to 30 lacs	-1.527	.546	.005	.217
	House price 31 lacs to 40 lacs	.873	.578	.131	2.394
	House price 41 lacs to 50 lacs	2.096	.534	.000	8.133
	House price 51 lacs to 60 lacs	1.434	.668	.032	4.195
	House price 61 lacs to 70 lacs	2.016	.726	.005	7.507
	House price 71 lacs to 80 lacs	.001	.652	.999	1.001
	House price above 80 lacs	-21.106	11436.915	.999	.000
	Age of residents 21to25	-.833	.391	.033	.435
	Family size – two to five persons	.703	.272	.010	2.019

Source: Prepared by Author

As shown in Table 6.8, home buyers from income group 6 lacs to 10 lacs are more likely to buy 2BHK apartments and it is followed by home buyers from income group 11lacs to 15 lacs. Home buyers for 2BHK apartments are mainly from service class and families with preschool-going and school-going children. Also, home buyers from families with two to five persons prefer 2BHK apartments. Home buyers are more likely to buy 2BHK apartments for house prices 41 lacs to 50 lacs, followed by house prices 51 lacs to 70 lacs. In terms of house size of 2bhk apartments, home buyers are more likely to prefer

house area of 701 sq. ft to 800 sq. ft., followed by house area of 601 sq. ft to 700 sq. ft and then house area of 901 sq. ft to 1000 sq. ft.

Table 6.9 Binary Logistic Regression Analysis for housing preferences related Housing Typology and economy

Dependent Variable	Independent variables	Binary Regression Analysis in SPSS			
		B	S.E.	Sig.	Exp (B)
3BHK	Income 1 lac to 5 lacs	.083	.470	.859	1.087
	Income 6 lacs to10 lacs	-1.733	.440	.000	.177
	Income 11 lacs to15 lacs	.968	.405	.017	2.632
	Income more than 15 lacs	2.167	.476	.000	8.734
	Occupation service	-1.034	.382	.007	.355
	Occupation Business	1.300	.411	.002	3.668
	Area 401 sq. ft to 500 sq. ft	-18.601	5573.762	.997	.000
	Area 501 sq. ft to 600 sq. ft	-18.601	5573.762	.997	.000
	Area 601 sq. ft to 700 sq. ft	-2.960	1.021	.004	.052
	Area 701 sq. ft to 800 sq. ft	-1.327	.740	.073	.265
	Area 801 sq. ft to 900 sq. ft	4.376	.644	.000	79.554
	Area 901 sq. ft to 1000 sq. ft	2.015	.889	.023	7.500
	Area 1001 sq. ft and above	4.079	.605	.000	59.062
	Families with teenagers	1.358	.474	.004	3.888
	Phase of life cycle – about to retire and in the retirement	1.225	.536	.022	3.404
	House price 11 lacs to 20 lacs	-18.541	7882.490	.998	.000

	House price 21 lacs to 30 lacs	-1.922	1.023	.060	.146
	House price 31 lacs to 40 lacs	-.912	1.031	.377	.402
	House price 41 lacs to 50 lacs	-.400	.380	.293	.671
	House price 51 lacs to 60 lacs	-18.555	7105.180	.998	.000
	House price 61 lacs to 70 lacs	-.058	.754	.939	.944
	House price 71 lacs to 80 lacs	2.666	.485	.000	14.381
	House price above 80 lacs	2.921	.613	.000	18.560
	Age of residents 51to 55	1.919	.624	.002	6.815
	Family size – above five persons	2.369	.432	.000	10.689

Source: Prepared by Author

Table 6.9 shows that the home buyers from income group more than 15 lacs are more likely to buy 3BHK apartments and it is followed by home buyers from income group 11 lacs to 15 lacs. These home buyers are mainly from business class and families with teenagers and families with more than five persons. Home buyers who are about to retire and in the retirement phase of life and belonging to the age group of 51 to 55 years are more likely to prefer 3BHK homes. In terms of house size for 3BHK apartments, home buyers are more likely to prefer house area 801 sq. ft to 900 sq. ft and it is followed by house area above 1001 sq. ft and house area 901 sq. ft to 1000 sq. ft. For 3BHK apartments, home buyers are more likely to prefer house prices 71 lacs to 80 lacs and above 80 lacs.

6.2.4 Architectural Design and planning of housing projects

H5: Home buyers consider factors related to Architectural Design and planning of the project which include natural ventilation, daylight, views from the house, size and typology of the house.

(Null Hypothesis) NH5: Home buyers do not consider factors related to Architectural Design and planning of the project which include natural ventilation, daylight, views from the house, size and typology of the house.

As shown in Table 6.10, for testing Hypothesis H5, housing preferences related to Architectural Design and Planning such as natural ventilation, natural daylight, views from the house, size and typology of the house are dependent variables and responses of home buyers such as “Strongly Agree” or “Agree” are the independent variables.

Table 6.10 Binary Logistic Regression Analysis for housing preferences related Architectural Design and planning of housing projects

Dependent Variable (Housing Preferences)	Independent Variable	Binary Regression in SPSS			
		B	S.E.	Sig.	Exp (B)
Natural Ventilation	Strongly Agree/Agree	5.726	1.112	.000	306.727
Natural daylight	Strongly Agree/Agree	3.533	.667	.000	34.214
Views from the house	Strongly Agree/Agree	4.299	.417	.000	73.611
size and typology	Strongly Agree/Agree	4.973	.421	.000	144.400

Source: Prepared by Author

As shown in Table 6.10, the result of Hypothesis H5 is statistically significant (value of Sig. < 0.05). H5 is accepted and NH5 is rejected. It concludes that home buyers are strongly agreed to consider factors related Architectural Design and planning of the project which include natural ventilation, daylight, views from the house, size and typology of the house. B value for Natural Ventilation is 5.726 which is the highest one. So, while buying a new house, home buyers are more likely to prefer natural ventilation in the house. It is followed by size and typology of the house. Then the next factor is views from the house. The B value of natural daylight is 3.533 which is the lowest one

among all the important factors related to Architectural Design and planning of the project. So, home buyers are less likely to prefer natural daylight in the new house over other factors.

6.2.5 Quality of residential environment and surroundings

H6: Home buyers consider all factors related quality of the residential environment and Surroundings.

(Null Hypothesis) NH6: Home buyers do not consider all factors related quality of the residential environment and Surroundings.

As shown in Table 6.11, for testing Hypothesis H6, all the factors related to the quality of the residential environment and surroundings are dependent variables and home buyer's responses such as "Strongly Agree" or "Agree" are the independent variables.

Table 6.11 Binary Logistic Regression Analysis for housing preferences related Quality of residential environment and surroundings

Dependent Variable (Housing Preferences)	Independent Variable	Binary Regression in SPSS			
		B	S.E.	Sig.	Exp (B)
A green space like public garden	Strongly Agree/Agree	3.623	.603	.000	37.440
children play area	Strongly Agree/Agree	4.566	.607	.000	96.171
jogging track	Strongly Agree/Agree	3.884	.440	.000	48.600
the neighborhood which is away from city traffic, pollution and congested areas	Strongly Agree/Agree	4.733	.382	.000	113.604
services and facilities like parking, lift, and 24X7 water supply, Security	Strongly Agree/Agree	5.633	1.181	.000	279.429

not in close proximity to slums	Strongly Agree/Agree	5.161	.655	.000	174.417
not in close proximity to crematoriums or burial grounds	Strongly Agree/Agree	5.655	.685	.000	285.600
Neighborhood which has good visual appearance	Strongly Agree/Agree	4.051	.395	.000	57.474
Locality which has scope for real estate and urban infrastructure development in near future	Strongly Agree/Agree	3.623	.393	.000	37.466

Source: Prepared by Author

As shown in Table 6.11, Hypothesis H6 is statistically significant (value of Sig. < 0.05). H6 is accepted and NH6 is rejected. It shows that home buyers consider all factors related quality of the residential environment and surroundings. The B value for buying a house, not in close proximity to crematoriums or burial grounds is 5.655, which is the highest one and hence it is the most preferred factor. It is followed by B value of 5.633 for basic services and facilities. It shows home buyers are more likely to prefer to buy houses considering basic services and facilities like parking, lift, 24X7 water supply and Security. The further, more likely to prefer factor is that a house should not be in close proximity to slums. While considering the quality of the residential environment home buyers are more likely to prefer the neighborhood which is away from city traffic, pollution and congested areas. Also, they consider the neighborhood which has a good visual appearance. Home buyers are more likely to prefer a children's play area over a jogging track and a green space like a public garden. Compare to all the important factors related to the quality of the residential environment and surroundings home buyers are less likely to buy a house in the locality which has scope for real estate and urban infrastructure development in near future.

Table 6.12 Binary Logistic Regression Analysis for housing preferences related Quality of residential environment and surroundings

Dependent Variable	Independent variables	Binary Regression Analysis in SPSS			
		B	S.E.	Sig.	Exp (B)
A green space like public garden	Income 1 lac to 5 lacs	.091	.386	.813	1.095
	Income 6 lacs to10 lacs	.227	.292	.437	1.255
	Income 11 lacs to15 lacs	-.194	.374	.603	.823
	Income more than 15 lacs	-.458	.564	.417	.633
children play area	Income 1 lac to 5 lacs	-.439	.332	.186	.644
	Income 6 lacs to10 lacs	.325	.282	.251	1.383
	Income 11 lacs to15 lacs	.203	.402	.614	1.225
	Income more than 15 lacs	-.017	.631	.979	.983
jogging track	Income 1 lac to 5 lacs	-.283	.290	.329	.753
	Income 6 lacs to10 lacs	.393	.237	.097	1.482

	Income 11 lacs to15 lacs	-.265	.302	.380	.767
	Income more than 15 lacs	.499	.626	.425	1.647
services and facilities like parking, lift, and 24X7 water supply, Security	Income 1 lac to 5 lacs	-1.115	.920	.226	.328
	Income 6 lacs to10 lacs	1.795	1.122	.110	6.020
	Income 11 lacs to15 lacs	-.248	1.125	.826	.781
	Income more than 15 lacs	-1.550	1.137	.173	.212
Locality which has scope for real estate and urban infrastructure development in near future	Income 1 lac to 5 lacs	-.619	.362	.087	.538
	Income 6 lacs to10 lacs	1.345	.346	.000	3.837
	Income 11 lacs to15 lacs	-.628	.373	.092	.534
	Income more than 15 lacs	-1.007	.526	.055	.365

Source: Prepared by Author

As shown in the Table 6.12 home buyers from income group 6 lacs to 10 lacs are more likely to buy a house in the locality that has scope for real estate and urban infrastructure development in near future.

6.3 Findings of Qualitative Research: Interviews with Private developers and a Researcher

A Ph.D. holder who has studied housing in Pune and three Private developers from PMR were interviewed and their responses are as follows:

1. What are the problems for housing development in Pune Metropolitan Region?

“Absence of comprehensive strategy: There is no four vision i.e., what is going to be required, where it is going to be required and how to provide it. In absence of strategy, housing is provided according to the required need of housing stock. It is just an add-on affair. There was never a strategy plan/policy for housing development and hence it has been only considered as a part of urban sprawl.”

“Infrastructure like water, drainage, bigger roads are very important for housing development but the government is not providing sufficient infrastructure where there is the availability of land. Growth in PMC is tremendous but accordingly, the sizes of roads are not increased by the government body. Land for new residential development is available towards Mumbai highway but due to lack of infrastructure private developers are not able to launch their projects in that area.”

“In PMC not much land is available for development but PCMC has fewer problems for housing development”

2. Which are the prime locations for housing projects in the metro region and why?

“Shivaji Nagar, Kothrud, Hadapsar Kharadi, Sinhgad road, Viman Nagar”

“Even though Shivaji Nagar and Kothrud are the core of the city, these areas are on the verge of redevelopment so private housing developers are coming up with redevelopment projects. To fulfill the requirements of houses in the central city area, developers are providing houses in smaller areas. E.g., Now 2bhk apartments are available for 800 sq. ft. for the cost of around 80 lakhs which was not possible in Pune central areas a few years

back. The investors in suburban areas are focusing more on connectivity to Mumbai. Thus, investors are different for central areas of Pune and suburban areas.”

“PCMC and areas around Mumbai highways can be used for more housing development due to land availability”

“Somatane phata, Mamurdi, Kiwale, and areas near Chakan industrial belt have the potential for more residential development due to connectivity to industries in Chakan. Areas such as Aundh-Baner, Balewadi, Ravet, wakad are important for connectivity to IT industries. Mawal, Talegoan areas are good for second home housing projects”

3. Do you think, is there any gap between what home buyers want and what private housing developers are providing to them?

“Not compatible in terms of area and cost: Developers are not creating houses of area requirements of the client. In urban areas whatever housing sizes developers are providing, residents have to get accommodated within that by changing their lifestyles/needs of spaces.”

“Developers can provide amenities like garden, swimming pool, security but later when society is formed it becomes really difficult for residents to maintain the amenities. Specifically, families with monthly income around 45000 Indian rupees, can not afford to pay for maintenance charges of amenities.”

4. According to you what are the important factors that can affect housing preferences in PMR considering its urban growth potentials?

“Connectivity and Public Transportation facility, Infrastructure such as bigger roads, electricity, water and drainage, housing cost, also people like to buy a house where people from their own community/caste are living nearby”

5. What is the best-preferred location for housing development in PMR and why?

“Aundh-Baner, Balewadi, Ravet, wakad because of better connectivity and good social setup. Areas around Mumbai highways due to availability of land. PCMC because of good infrastructure, IT hubs, education hubs.”

6. Do you carry out a housing preference survey before designating an area as a residential or a housing district?

“Private developers hire a marketing team to understand current trends of housing sales. Government is not doing any such surveys.”

7. Opinion about housing permitting criteria housing preference survey before designating housing zones in PMR

“In democratic set up restrictions on housing development on private land (if it is in a residential zone) can not be imposed on private developers but it can be controlled if residential land use is provided by the Government Planning Authorities as per the housing preference surveys. Also, awareness and counseling can be done to the private developers through incentives in terms of TDR that means if a private developer has ownership of residential land which he wants to use for housing development but it is not the requirement of that area and if it is going to increase pressure on infrastructure then such developer can get equal FSI and TDR to develop housing in the areas where it is actually required.”

“Sanctioning process is very slow. Private developers are facing the burden of providing infrastructure like roads, electricity, water, drainage on their own because of which many times private developers have to bear the financial loss. If the government can help to provide infrastructure it can minimize the pressure on private developers.”

“Sanctioning process should have single window system.”

8. What are the most commonly demanded housing preferences by your housing customers when they come to you to buy a home? What are the three important housing preferences?

“Location in PCMC, housing cost – More demand is for 2bhk for 50-60 lakhs price, construction quality like wall finishes, laminated doors, size of kitchen platform, three-track windows, granite door frames and window seals, finishes for bathrooms, etc.”

“Home buyers in PMR are more concerned for all legal documents for house purchasing, no cash payments and government authorized projects. Basic amenities such as school, hospital market nearby, no need for theatre, distance from job, community.”

9. How PMR customers are different from other cities in terms of their housing preferences? And What needs to be done to address their preferences?

“Home buyers in PMR are very concerned about all the legal documents related project, the reputation of the builder and urban facilities nearby”

6.3.1 Summary of Qualitative Research

The developers have suggested that government should focus on providing more road connectivity in the areas along Mumbai-Pune corridor. Future residential development can happen along Mumbai-Pune Connecting Corridor. Developers have stated in their interviews that demand for 2BHK apartments is more in PMR. Also, private developers have mentioned that home buyers like to buy houses where people from their own community/caste are living nearby.

6.4 Summary of Analysis

This chapter of the research has found out important factors that home buyers consider while buying a house in Pune Metropolitan Region. Responses of home buyers were analyzed by using descriptive statistics and binary logistic regression. Also, qualitative research has helped to understand the points of view of housing developers. Connectivity and transportation, proximity to amenities, facilities and services and factors related to economy are among the first three most important housing preferences. It is followed by factors related to social aspects, Architectural design and planning of housing projects and quality of residential environment and surroundings.

The important factors related to connectivity and transportation facilities in terms of proximity within 0-30 minutes driving distance are connectivity to Mumbai-Pune connecting corridor, connectivity to BRT corridor, connectivity to main city roads, connectivity to Pune City, connectivity to PCMC, connectivity to other parts of PMR, connectivity to proposed Pune ring road and proposed metro stations. Connectivity to Mumbai-Pune Corridor within 0-30 minutes driving distance is the most important factor. It is followed by connectivity to BRT corridors, proposed metro stations and connectivity to PCMC. Connectivity to Pune City is important but home buyers are less likely to prefer it. Also, Private housing developers have mentioned in their interviews that there is a lack

of land availability in Pune city due to its extensive growth and now PCMC and areas along Pune-Mumbai corridor have more potential for further housing development. Hence, the developers have suggested that government should focus on providing more road connectivity in the areas along Mumbai-Pune corridor. Housing preference in terms of availability of bus stops within 15 minutes walking distance is important. Mainly, home buyers from income group 1 lac to 5 lacs are more likely to prefer connectivity to Bus stop. Connectivity to Mumbai-Pune corridor, connectivity to BRT corridor and connectivity to PCMC are important for home buyers from income group 6 lacs to 10 lacs.

Amenities, facilities and services available within the proximity of 0-30 minutes driving distance are important factors. Home buyers in PMR are more likely to prefer commercial activities like restaurants and shopping malls, School/College/Educational Institutions, workplace and health care facilities and entertainment centers like multiplexes. Availability of health care facilities and availability of School/College/Educational institutions within the proximity of 0-30 minutes driving distance are the most important. It is followed by a preference for Commercial activities like restaurants and shopping malls. Home buyers are less likely to prefer workplace and entertainment centers within 0-30 minutes driving distance from their new homes. Also, Home buyers prefer to buy houses where convenience stores are available within 15 minutes walking distance. Home buyers from income group 6 lacs to 10 lacs are more likely to prefer factors such as availability of restaurants, shopping malls, schools and workplace. Proximity to schools is important for families with preschool-going and school-going children. Also, home buyers from service class are more likely to prefer houses near workplace for housing costs varying from 41 lacs to 50 lacs. In terms of proximity to restaurants and shopping malls home buyers are more likely to prefer the housing costs varying from 61 lacs to 70 lacs.

Home buyers consider factors related economy such as housing typology, area of the house, family income, family size, house price and occupation. Home buyers from income group 1 lac to 5 lacs prefer to buy 1BHK apartments. Also, unattached adults and families with two to three persons prefer to buy 1BHK apartments. For 1BHK apartments, home buyers prefer housing costs varying from 11 lacs to 30 lacs and areas from 401 sq. ft to 600 sq. ft. Home buyers from income group 6 lacs to 10 lacs and from income group 11 lacs to 15 lacs prefer to buy 2BHK apartments. Also, Home buyers from service class and

families with preschool and school-going children prefer 2BHK apartments. Also, families with two to five persons prefer 2BHK apartments. For 2BHK, the most preferred housing costs are varying from 41 lacs to 50 lacs followed by housing costs varying from 51 lacs to 70 lacs. Home buyers mainly prefer 2BHK apartments of sizes 701 sq. ft to 800 sq. ft., followed by 601 sq. ft to 700 sq. ft and 901 sq. ft to 1000 sq. ft. Also, as per qualitative research, housing developers have stated in their interviews that demand for 2BHK apartments is more in PMR. Home buyers from income group more than 15 lacs are more likely to buy 3BHK apartments and it is followed by home buyers from income group 11 lacs to 15 lacs. These home buyers are from business class and families with teenagers. Families with more than five persons prefer 3BHK apartments. Home buyers who are about to retire and in the retirement phase of life and who are from the age group of 51 to 55 years are more likely to prefer 3BHK homes. Home buyers prefer 3BHK apartments of sizes 801 sq. ft to 900 sq. ft, followed by house area above 1001 sq. ft and house area 901 sq. ft to 1000 sq. ft. For 3BHK apartments, home buyers are more likely to prefer housing prices of 71 lacs to 80 lacs and above 80 lacs.

Next to economy, factors considering the social aspects such as status of education of residents in the neighborhood, the residential area near to locality where home buyer's relatives and friends are living and health requirements of elders in the house are the most important factors. Also, as per qualitative research, private housing developers have mentioned in their interviews that home buyers like to buy houses where people from their own community/caste are living nearby.

The important factors related to Architectural Design and planning of the project are natural ventilation, daylight, views from the house, size and typology of the house. Out of these factors, the most important factor is natural ventilation followed by size and typology of the house. Then the next important factor is views from the house. Home buyers are less likely to prefer natural daylight in the house over other factors.

Home buyers consider all factors related quality of the residential environment and surroundings. The most important factor is that home buyers do not prefer to buy a house in close proximity to crematoriums or burial grounds. It is followed by the housing preferences related to basic services and facilities like parking, lift, 24X7 water supply and security. The next important factor is that a house should not be in close proximity to slums.

Home buyers are more likely to prefer the neighborhood which is away from city traffic, pollution and congested areas. Also, they consider the neighborhood which has a good visual appearance. Home buyers are more likely to prefer a children's play area over a jogging track and a green space like a public garden. Compare to all the important factors related quality of the residential environment and surroundings home buyers are less likely to prefer a house in the locality which has scope for real estate and urban infrastructure development in near future. But home buyers from income group 6 lacs to 10 lacs are more likely to buy a house in the locality that has scope for real estate and urban infrastructure development in near future.

Thus, Table 6.13 summarizes important factors found out from hypothesis testing.

Table 6.13 Hypotheses and Results (Important factors)

Hypotheses	Results (Important factors)
H1: Home buyers prefer to buy houses considering 0-30 minutes driving distance from connectivity and transportation facilities.	Preference for important connectivity and transportation facilities in terms of proximity of 0-30 minutes driving distance: 1. Connectivity to Mumbai-Pune connecting corridor 2. Connectivity to BRT corridor 3. Proposed Metro stations 4. Connectivity to PCMC 5. Connectivity to Proposed Pune Ring Road 6. Connectivity to main city roads 7. Connectivity to other parts of PMR 8. Connectivity to Pune City
H2: Home buyers prefer houses where the bus stop is located within 15 minutes walking distance from the house.	1. Bus Stops within 0-15 minutes walking distance

H3: Home buyers have considered amenities and facilities available within the proximity of 0 to 30 minutes driving distance.	Preference for important amenities and facilities available within the proximity of 0 to 30 minutes driving distance: 1. Hospitals and other health care facilities 2. School/College/Educational Institution 3. Commercial activities like restaurants and shopping malls 4. Entertainment centers like multiplexes 5. Workplace
H4: Home buyers prefer houses where proximity to convenience stores is within 15 minutes walking distance while buying a new house.	1. Convenience stores within 0-15 minutes walking distance
H5: Home buyers consider factors related to Architectural Design and planning of the project which include natural ventilation, daylight, views from the house, size and typology of the house.	Important factors related to Architectural Design and planning of the project: 1. Natural Ventilation 2. size and typology 3. Views from the house 4. Natural daylight
H6: Home buyers consider all factors related quality of the residential environment and Surroundings.	Important factors related to the quality of residential environment and Surroundings: 1. not in close proximity to crematoriums or burial grounds 2. services and facilities like parking, lift, and 24X7 water supply, Security 3. not in close proximity to slums 4. the neighborhood which is away from city traffic, pollution and congested areas 5. children play area

	6. The neighborhood which has a good visual appearance 7. jogging track 8. A green space like a public garden 9. Locality which has scope for real estate and urban infrastructure development in the near future
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Source: Prepared by Author

Chapter 7. Conclusion, Recommendation implications, Indicative Proposals and Scope for Future Research

7.1 Conclusion

The overall analysis of the housing preferences survey in PMR shows that connectivity to Mumbai-Pune Connecting Corridor is one of the most important factors that affect a house buying decision in PMR. Also, in terms of urban transportation facilities, residential areas around bus stops, BRT Corridors and proposed Metro stations are important. Houses located within 0-30 minutes driving distance from the above-mentioned transportation facilities are the most preferred by the home buyers. The most preferred amenities by home buyers in PMR are convenience stores, hospitals, schools/educational institutes, shopping malls, restaurants, entertainment centers and workplaces. People with income 6 lacs to 10 lacs range are the dominant home buyers in PMR and the most preferred housing type in the study area is 2BHK and the second most preferred one is 1BHK apartment units. The housing-unit floor area range in the study area is 401 sq. ft to 800 sq. ft. Status of education of residents, the residential area near to locality where home buyer's relatives and friends are living, health requirements of elders in the house are the most important social aspects that show considerable influence over the house buying decision of home buyers in PMR. The most preferred factors related to Architectural Design and planning of the housing project are natural ventilation, area of the housing unit, typology of the house in terms of 2BHK/1BHK/3BHK and views from the house. Home buyers' preferences for factors related to the quality of residential environment and surroundings are the most heterogeneous as home buyers have preferred numerous factors. Home buyers mainly prefer the quality of the residential environment and surroundings based on the factors such as a house that is not in close proximity to crematoriums or burial grounds and housing projects which have basic services like parking, lift, 24X7 water supply and security. Further important factors are not in close proximity to slums, away from city traffic, pollution and congested areas, the neighborhood which has a good visual appearance, housing projects with children play area, jogging track, a green space like public garden and locality which has scope for real estate and urban infrastructure development in near future.

7.2 Recommendation implications

Connectivity to Mumbai-Pune connecting corridor is one of the most important factors for home buyers and hence, it can lead to more demand for residential development along Mumbai-Pune Connecting Corridor in near future. PMRDA can establish a special planning authority for infrastructure development along Mumbai-Pune corridor. Also, PMRDA shall emphasize providing more housing stocks in the residential areas around the most preferred transportation facilities such as BRT stations and Metro stations. Residential zones can be developed by good integration with the most preferred amenities to increase proximity to convenience stores, hospitals, schools/educational institutes, shopping malls, restaurants, entertainment centers and workplaces. Based on above mentioned important factors, PMRDA can allocate high preferences residential zones. Housing development in such high preference residential zones can be accelerated by the provision of additional FSI for the most preferred housing types which are 2BHK and 1BHK apartments. Housing Development sanctioning authority can apply housing preferences accreditation based on the important factors related to Architectural design and planning of the housing project and also, based on the important factors related to the quality of residential environment and surroundings.

Here, Table 7.1 shows key analysis and based on analysis brief recommendation implications are stated.

Table 7.1 Key Analysis and Recommendation implications

Key Analysis	Recommendation implications
Connectivity and Transportation: connectivity to Mumbai-Pune Connecting Corridor is one of the most important factors that affect a house buying decision in PMR. Also, in terms of urban transportation facilities, residential areas around bus stops, BRT Corridors and proposed Metro stations are important. Houses located within 0-30 minutes	The housing developers should locate housing within the 0-30 minutes driving distance from important transportation facilities. The planning authorities should zone residential areas that are well connected to Mumbai-Pune corridors. The planning authorities and housing developers should designate and propose

driving distance from the above-mentioned transportation facilities are the most preferred by the home buyers.	housing around bus stops and BRT corridors and metro stations.
proximity to amenities, facilities and services within 0-30 minutes driving distance The most preferred amenities by home buyers in PMR are convenience stores, hospitals, schools/educational institutes, shopping malls, restaurants, entertainment centers and workplaces.	Housing developers should consider the following most preferred amenities in their projects: convenience stores, hospitals, schools/educational institutes, shopping malls, restaurants, entertainment centers and workplaces
Economy: People with income 6 lacs to 10 lacs range are the dominant home buyers in PMR and the most preferred housing type in the study area is 2BHK and the second most preferred one is 1BHK apartment units. The housing-unit floor area range in the study area is 401 sq. ft. to 800 sq. ft.	Housing developers and planners should consider producing a large share of housing units of size range 401-800 sq. ft.
Social Aspects: Status of education of residents, the residential area near to locality where their relatives and friends are living, health requirements of elders in the house are the most important social aspects that show considerable influence over the house-buying decision of home buyers in PMR.	-
Architectural design and planning of housing projects: The most preferred factors related to Architectural Design and planning of the	The developers should make sure that the houses have natural ventilation, have good access to natural views, area of the housing

housing project are natural ventilation, area of the housing unit, typology of the house in terms of 2BHK/1BHK/3BHK and views from the house.	unit (401-800 sq. ft), typology (1BHK and 2BHK apartments)
Quality of residential environment and surroundings: Home buyers' preferences for factors related to the quality of residential environment and surroundings are the most heterogeneous as home buyers have preferred numerous factors. Home buyers mainly prefer the quality of the residential environment and surroundings based on the factors such as a house that is not in close proximity to crematoriums or burial grounds and housing projects which have basic services like parking, lift, 24X7 water supply and security. Further important factors are not in close proximity to slums, away from city traffic, pollution and congested areas, the neighborhood which has a good visual appearance, housing projects with children play area, jogging track, a green space like public garden and locality which has scope for real estate and urban infrastructure development in near future.	The developers should make sure that the housing projects are not located near crematorium and burial grounds and the projects have 24-hour access to water supply and good housing guard security. The area should have a good physical appearance (maybe landscaping) with facilities such as a children's play area, jogging track, green public garden and have the scope of future real estate growth.

Source: Prepared by Author

7.3 Indicative proposals based on Recommendation implications

This section has discussed indicative proposals for the Local Planning Authority and Housing Developers based on recommendation implications. As discussed above based on the identified important factors that affect housing preferences in PMR, the residential development shall be done considering the following suggestive guidelines:

7.3.1 Housing preferences zones

Special zones can be allocated considering important factors related to housing preferences in PMR. Such zones can be demarcated as High Preference Residential Zone. Such zones can be defined as per the important housing preferences in terms of connectivity and transportation, proximity to urban amenities. The purpose of defining these zones is to increase the housing stock which can be as per the preferences of home buyers in PMR. Special emphasis could be given to promote housing development in high preference residential zones by providing incentives in terms of additional FSI for residential buildings. Home buyers can get houses with important road connectivity and transportation facilities that will connect to IT hubs, other industrial areas, PCMC and Mumbai. Town planning authorities shall also conduct a housing preferences survey to identify high preference residential zones. Presently, there are no residential preferences zones in the regional plan of PMR.

7.3.2 Connectivity and transportation

Residential zones along Mumbai-Pune connecting corridor

Special emphasis shall be given to the development of residential areas along Pune-Mumbai connecting corridor. As shown in Image 7.1 and Image 7.2, 1km belt on both sides of Mumbai-Pune expressway from Kiwale to Talegaon-Chakan road can be included under PCMC residential zone and PMRDA can establish special planning authority for infrastructure development along Mumbai-Pune corridor. 1 km distance can be walked within approximately 15-18 minutes and 1km belt can accommodate a township project of 25 acres to 100 acres. Thus, it will facilitate the development of urban infrastructure for potential residential development. Presently, this land includes vacant plots, farms and sporadic development.

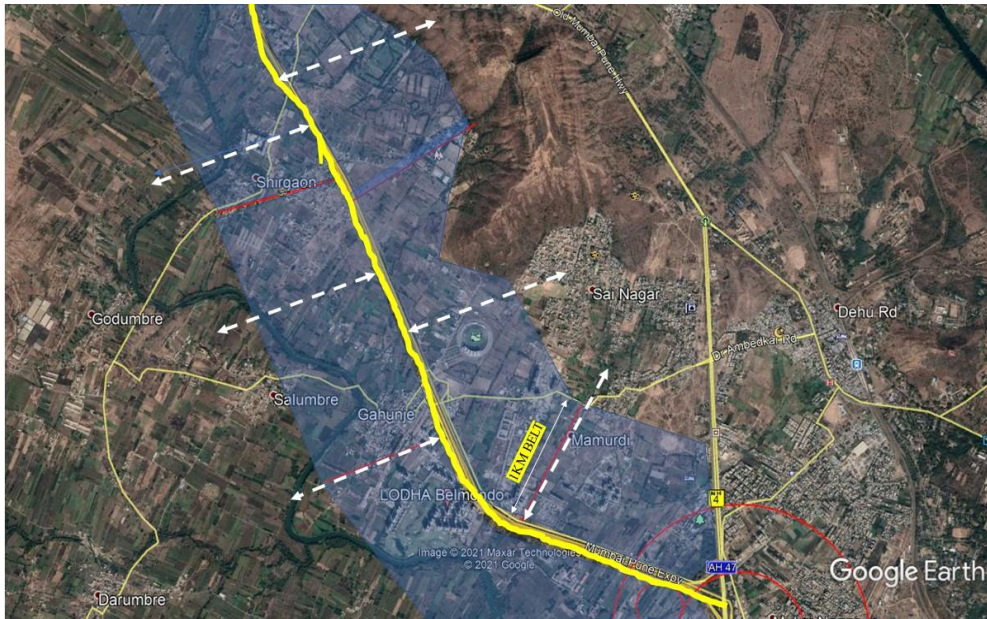


Image 7.1 Google map showing 1km belt for high preference residential development along Mumbai-Pune Connecting Corridor (from Kiwale to Talegaon- Chakan Road)

Source: Prepared by Author on Google Map

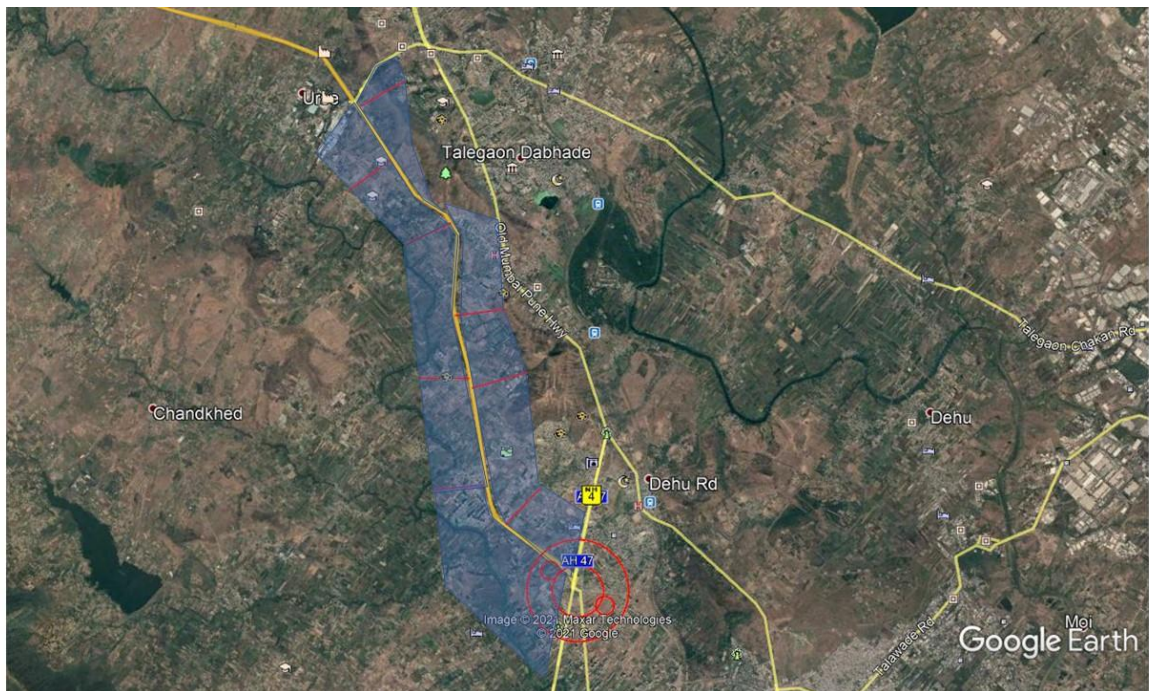


Image 7.2 Google map showing Mumbai-Pune Connecting Corridor from Kiwale to Talegaon- Chakan Road

Source: Prepared by Author on Google Map

Figure 7.1 is the conceptual sketch showing the 1km wide high preference residential zone along both sides of Mumbai-Pune connecting corridor. 15m wide city roads at 1km intervals parallel to Mumbai-Pune highway can provide connectivity to surrounding residential areas.

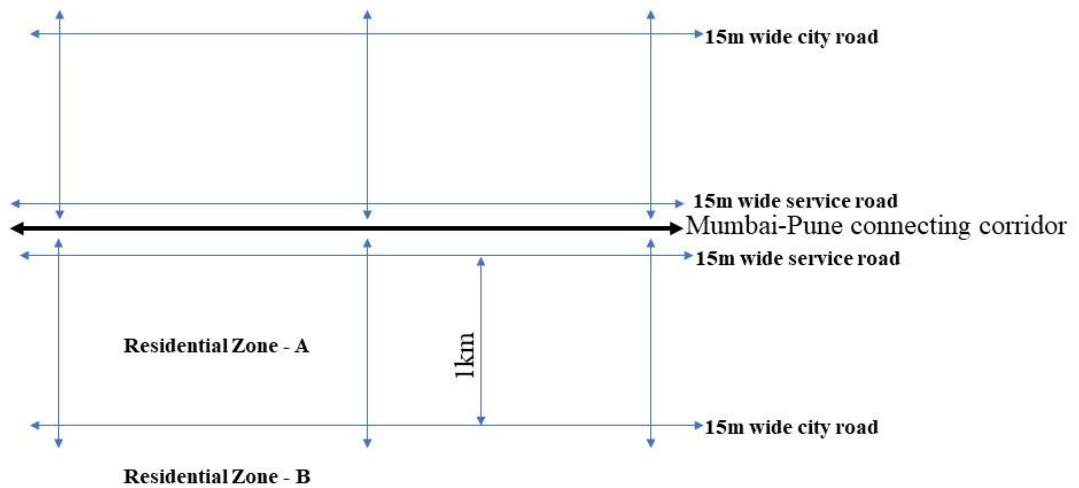


Figure 7.1 1km belt for high preference residential development along Mumbai-Pune Connecting Corridor

Source: Prepared by Author

Residential zones around BRT Station and Metro stations

The residential area within the 1 km radius from existing BRT stations and proposed metro stations in non-congested areas can be considered as High preference residential zones.

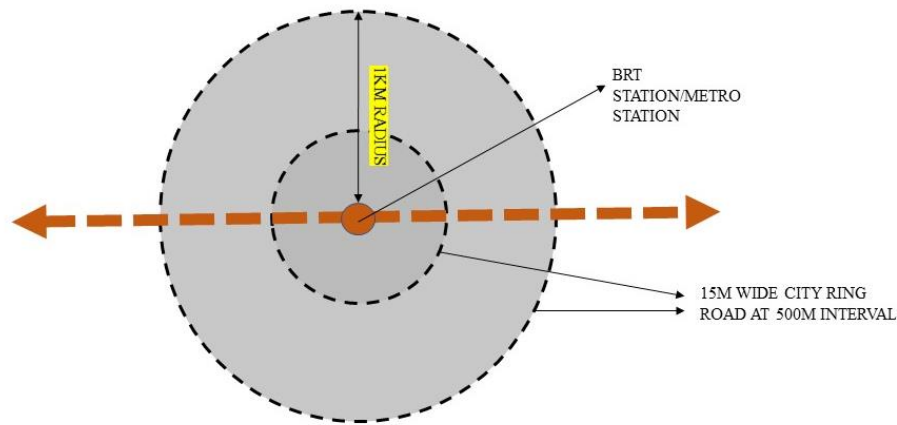


Figure 7.2 High preference residential zone within 1km radius from BRT stations and proposed Metro stations

Source: Prepared by Author

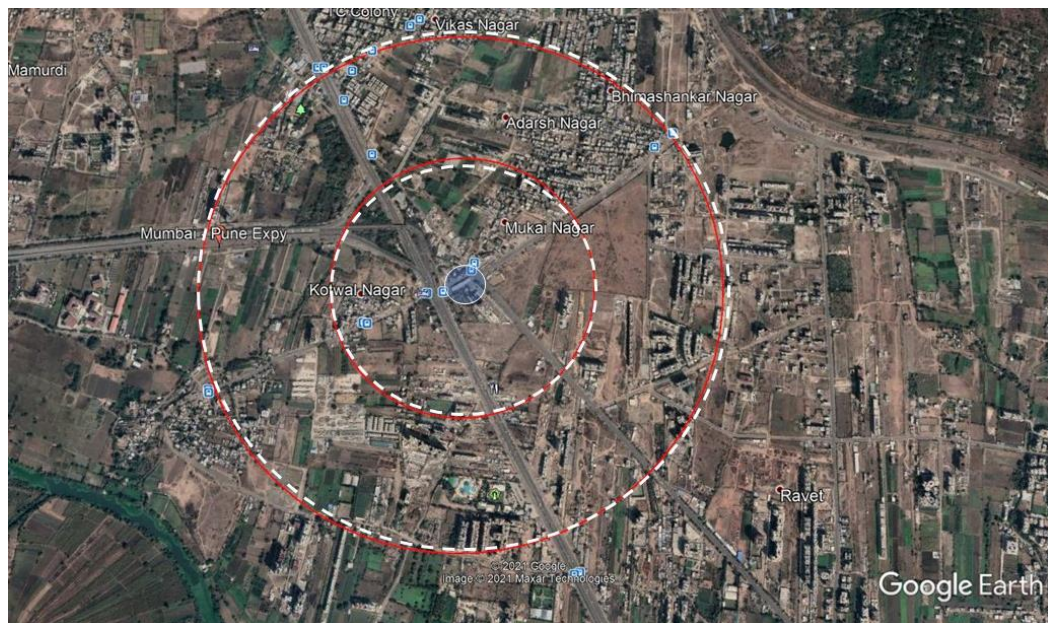


Image 7.3 Google map showing High preference residential zone within 1km radius from Ravet BRT station in PMR

Source: Prepared by Author on Google Map

As shown in Figure 7.2 and Image 7.3, 15m wide city ring roads can be provided at 500m radial intervals for better accessibility to residential areas around BRT stations/metro stations.

7.3.3 Proximity to amenities, facilities and services

Urban facilities corridor /belt

In terms of proximity of 0-30 minutes driving distance from the home, the most preferred amenities by home buyers in PMR are convenience stores, hospitals, schools/educational institutes, shopping malls, restaurants, entertainment centers and workplaces. The provision of urban facilities corridor/belt in non-congested residential areas can support the development of a high preference residential zone around it. This Urban facilities corridor can be proposed in the periphery of PCMC.

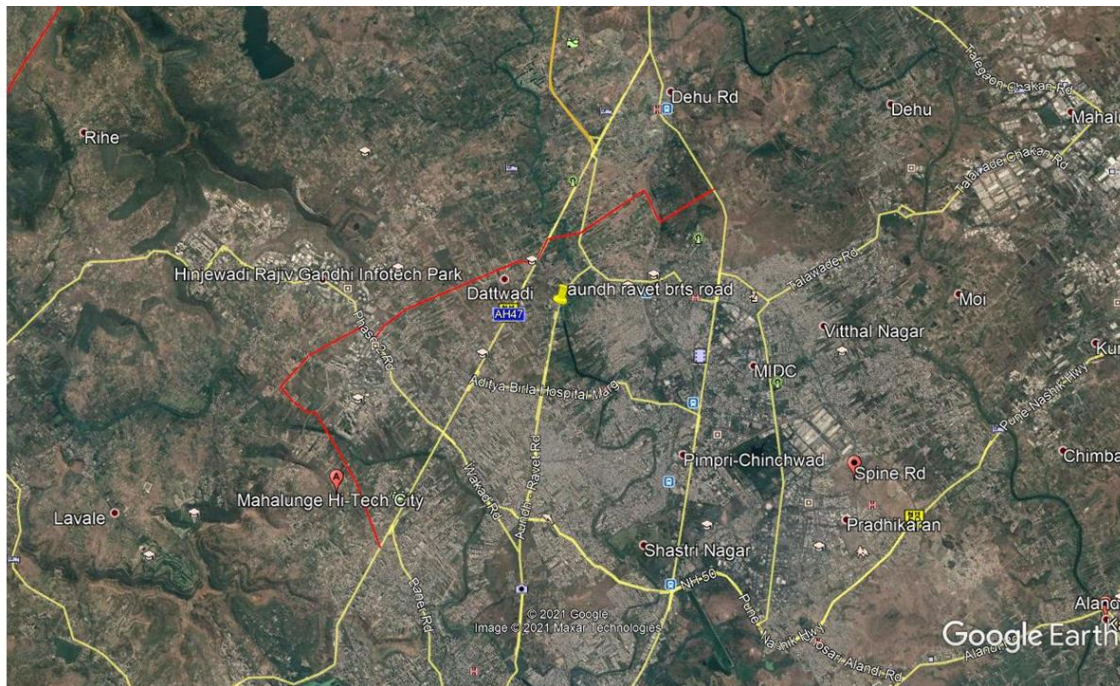


Image 7.4 Google map showing Urban Facilities Corridor/ Belt in PMR (highlighted as a red line)

Source: Prepared by Author on Google Map

Image 7.4 shows an example of the proposed Urban Facilities Corridor/ Belt which is in the periphery of PCMC and it is connecting to Mahalunge Hi-Tech city, IT Hinjewadi, Mumbai-Pune Highway, Ravet and Dehu road.



Image 7.5 Google map showing Urban Facilities Corridor/ Belt in PMR

Source: Prepared by Author on Google Map



Image 7.6 Google map showing Urban Facilities Corridor/ Belt in PMR

Source: Prepared by Author on Google Map

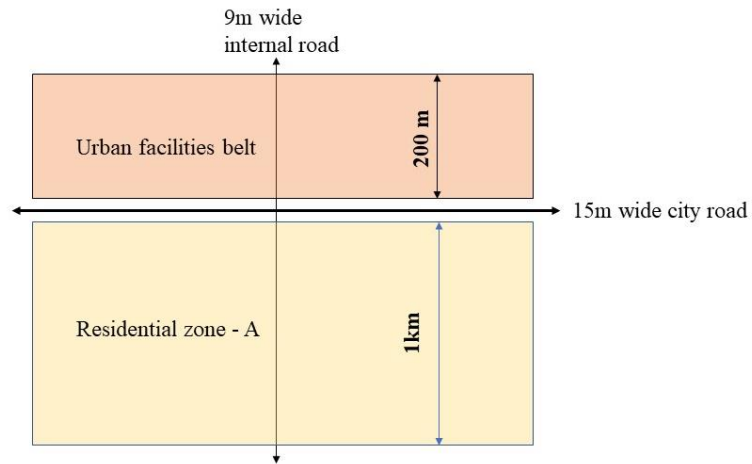


Figure 7.3 Urban Facilities Belt and High preference residential zone

Source: Prepared by Author

Figure 7.3 shows a conceptual sketch of 200m wide Urban Facilities Belt along one side of 15m city road and a purely residential zone on the other side of the road. Urban Facilities Belt includes mixed development with 60% residential and 40% Urban Facilities. Thus, residential development within urban facilities belt and 1Km distance on another side of the city road can be included in high preference residential zone. Urban Facilities will include convenience stores, hospitals, schools/educational institutes, shopping malls, restaurants, entertainment centers and workplaces. The pure residential zone can also include convenience stores and clinics.

Incentives for High Preference Residential Development

Additional FSI

Additional FSI to existing allowable FSI in high preference residential zones can be permissible if developers will provide housing as per the following housing preferences related to the area and typology of the houses:

Table 7.2 Additional FSI for Housing Typology

Typology	Additional FSI on existing permissible FSI
1 BHK	Additional 0.2
2 BHK	Additional 0.2

Source: Prepared by Author

Table 7.3 Additional FSI for Carpet Area

Carpet area (sq.ft)	Additional FSI on existing permissible FSI
401-500	Additional 0.2
501-600	Additional 0.2
601-700	Additional 0.2
701-800	Additional 0.2

Source: Prepared by Author

Housing preferences accreditation

It shall be made mandatory for housing developers to conduct a housing preference survey as a part of the sanctioning process by the sanctioning authority. Housing developers shall make a report of housing preferences that they have considered for proposed housing and shall submit it to sanctioning authority. Sanctioning authority can give accreditation certificates and incentives based on the maximum considerations of housing preferences in the proposed housing project. This accreditation certificate can help developers to promote their housing projects as well as home buyers can easily identify the housing where they

are most likely to get the house of their preferences. Planning departments can establish a special committee for housing preferences accreditation of proposed housing projects.

7.4 Scope for future research

This study was limited to Pune Metropolitan Region. The factors studied were in the context of PMR. So similar study can be conducted in the other Metropolitan Regions in India. It will help to understand important housing preferences which are relevant to other Metropolitan Regions. Home buyers selected for the interview survey were residents of PMR. This study did not consider home buyers residing in the surrounding cities of PMR such as Mumbai, Nashik, etc. Home buyers from surroundings cities of PMR may wish to buy a house in PMR for an investment purpose. So, future research can focus on the housing preferences of home buyers from surrounding cities of PMR. The scope of the research was limited to understanding the important factors of housing preferences in PMR. So, based on important factors indicative proposals are discussed. Understanding the feasibility and applicability of these indicative proposals was not the scope of the study. Thus, future research can focus on understanding the feasibility and applicability of proposals based on housing preferences in PMR.

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Research Papers Publications

Research Papers Published:

1. Sharma, S. (2021). Review of methodological approaches for the study on housing preferences. *Shodh Sarita*, 8(29).
2. Sneha Suresh Sharma, Dr. Tej Kumar Karki (2022). IMPORTANT HOUSING PREFERENCES OF HOME BUYERS IN PUNE METROPOLITAN REGION IN INDIA. *Journal of East China University of Science and Technology*, 65(3),486-498.
https://hdigdxxb.info/index.php/JE_CUST/article/view/486.html

Research Papers Presented:

1. Sharma, S. (2020). Understanding Home Buying Preferences in Pune Metropolitan Region (PMR). *Nepal Urban Dialogue 2020: National Conference on Sustainable-resilient Cities and Municipalities*. (Oct 31st – Nov 1st 2020).
2. Sharma, S. (2021). Understanding Housing Preferences: Systematic Literature Review and factors affecting housing preferences in Pune Metropolitan Region. *International Conference on Built Environment, Science and Technology*. (Feb 20th – Feb 21st 2021).
3. Sharma, S. (2021). Review of methodological approaches for the study on housing preferences. *National Students Conference 'Research in Architecture,' 3rd Edition*. (May 7th – May 8th 2021).

Appendix I: Questionnaire for home buyers in PMR

11/1/21, 4:38 PM	FACTORS AFFECTING HOME BUYER'S PREFERENCES OF BUYING A HOUSE IN PUNE METROPOLITAN REGION	11/1/21, 4:38 PM	FACTORS AFFECTING HOME BUYER'S PREFERENCES OF BUYING A HOUSE IN PUNE METROPOLITAN REGION
FACTORS AFFECTING HOME BUYER'S PREFERENCES OF BUYING A HOUSE IN PUNE METROPOLITAN REGION PREFENCES OF BUYING A HOUSE IN PUNE METROPOLITAN REGION PHD Scholar : Ar. Sneha Sharma Mob. no. : 9028843313 Email : snehashrmi123@gmail.com This sample survey is a part of ongoing PhD Research on 'Factors Affecting Home Buyer's Preferences of Buying A House in Pune Metropolitan Region' by Ar. Sneha Sharma, under the supervision of Dr. Tej Kumar Karki at Lovely Professional University, Punjab. The objective of the questionnaire is to understand the important factors affecting home buyer's preferences for buying a house in Pune Metropolitan Region. Regarding this, home buyers who have bought a house in the last five years and home buyers who are willing to buy a house in the next five years in Pune Metropolitan Region will be interviewed. Notes: 1.The identity of the Residents giving their responses to this study will be treated as highly confidential. 2.The collected answers/preferences will be used only for academic purpose (Publication of PhD Thesis and Research Papers for conferences and Journals). 3.Please select the desired variables of housing preferences. 4. Select Type A, if you have bought a house in the last five years. 5. Select Type B, if you are willing to buy a house in the next five years. *Required 1. Email * 2. Select Type of Home Buyer Mark only one oval. ☐ Type A- Home buyer who has bought a house in the last five years Skip to question 3 ☐ Type B- Home Buyer who is willing to buy a house in the next five years Skip to question 52 TYPE A Home buyer who has bought a house in the last five years			
1. Name of Housing Society/Housing project.etc where you have bought a new house. * 2. Location (Give name of the location of housing society where you have bought a new house in Pune Metropolitan Region, eg. Sadashivpeth, Kothrud, Pimpri, Hinjewadi etc.) * 3. Town * 4. City * 5. Pin-code * 6.District * 7. Name of the Respondent * 8. Contact number *			

11/1/21, 4:36 PM	FACTORS AFFECTING HOME BUYER'S PREFERENCES OF BUYING A HOUSE IN PUNE METROPOLITAN REGION	11/1/21, 4:36 PM	FACTORS AFFECTING HOME BUYER'S PREFERENCES OF BUYING A HOUSE IN PUNE METROPOLITAN REGION
11. 9. Age *	_____	15. 13. Education *	_____
		Mark only one oval.	
12. 10. Gender *		☐ No formal Education	
Mark only one oval.		☐ SSC (10th standard)	
☐ Female		☐ HSC (12th standard)	
☐ Male		☐ Diploma/any other equivalent course	
		☐ Graduation	
		☐ Post Graduation	
		☐ Mphil	
		☐ PhD	
		☐ Other: _____	
13. 11. Marital Status *		16. 14. Occupation *	
Mark only one oval.		Mark only one oval.	
☐ Married		☐ Service	
☐ Single		☐ Business	
☐ Divorced		☐ Any Other	
☐ widow/widower			
14. 12. Phase of family life cycle *		17. 15. Annual family Income *	
Mark only one oval.		(In case of married , if husband and wife both are earning then add income of both)	
☐ Unattached Adult		_____	
☐ Young Married with no children			
☐ Childbearing family with pre-school children		18. 16. Price of new house *	
☐ Childbearing family with school children		_____	
☐ Childbearing family with teenagers			
☐ About to retirement		19. 17. When did you buy a new house? (month and year) *	
☐ retirement / Senior years		_____	
☐ Other: _____			

11/121, 4:36 PM

FACTORS AFFECTING HOME BUYER'S PREFERENCES OF BUYING A HOUSE IN PUNE METROPOLITAN REGION

11/121, 4:36 PM

FACTORS AFFECTING HOME BUYER'S PREFERENCES OF BUYING A HOUSE IN PUNE METROPOLITAN REGION

20.

18. Why did you buy a new house? *

(Explain your reasons for buying a new house)

21.

19. What is your comment on the house that you have bought? *

22.

20. What two factors you cared the most while making a home buying decision? *

(Explain two things/factors/thoughts about which you were the most concerned when you were deciding to buy a house)

23.

21. Did you buy a new house considering following Housing Preferences related finance ? *

Mark only one oval per row.

	Yes	NO
a. Renting out possibility	☐	☐
b. Larger house at affordable price in suburban area	☐	☐
c. Good resale value	☐	☐
d. Tax benefit on loan	☐	☐

24.

22. What is the price of your new house? *

Mark only one oval.

☐ Rs. 10 lac – 50 lacs
 ☐ Rs. 51 lac – 1 crore
 ☐ Above Rs. 1 crore

25.

23. How much housing loan did you preferred? *

Mark only one oval.

☐ less than 10 lacs
 ☐ Rs. 10 lac – 50 lacs
 ☐ Rs. 51 lac – 1 crore
 ☐ Above Rs. 1 crore

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FACTORS AFFECTING HOME BUYER'S PREFERENCES OF BUYING A HOUSE IN PUNE METROPOLITAN REGION

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FACTORS AFFECTING HOME BUYER'S PREFERENCES OF BUYING A HOUSE IN PUNE METROPOLITAN REGION

26.
24. How much EMI of housing loan did you preferred per month? *

Mark only one oval.

☐ Rs. 0 - 25,000
☐ Rs. 25,000 - 50,000
☐ Rs. 50,000 - 1 lac
☐ more than Rs. 1 lac

27.
25. Did you buy a new house considering following housing preferences related area of the house? *

Mark only one oval per row.

	Yes	No
a. Specific Housing Size	☐	☐
b. bigger size of house for growing family size	☐	☐

29.
27. What typology of house did you prefer while buying a new house? *

Mark only one oval.

☐ 1 RK/Low cost housing
☐ Studio apartment
☐ 1BHK apartment
☐ 2BHK apartment
☐ 3BHK apartment
☐ Duplex Flat
☐ Row house
☐ Bungalow plot
☐ Other: _____

30.
28. What is the area of the new house that you have bought ? *

Tick all that apply.

☐ 200 sq.ft - 500sq.ft
☐ 501 sq.ft - 800 sq.ft
☐ 801 sq.ft - 1100 sq.ft
☐ 1101 sq.ft - 1400 sq.ft
☐ Above 1400 sq.ft

Other: ☐ _____

31.
29. Did you prefer to buy a new house because you wanted to stay at the specific location in Pune Metropolitan region? *

Mark only one oval.

☐ Yes
☐ No

32. Why did you choose this location to buy a new house? *

33. What were your housing preferences considering the travel time to following connectivity and transportation facilities from a new house? *

(Note: If you are filling the form from your mobile phone, slide to the right-left to see the titles of the columns)

Mark only one oval per row.

0-15 minutes walking

15-30 minutes Driving Distance

30-60 minutes Driving Distance

More than 60 minutes Driving Distance

Not Applicable

33. Did you prefer to buy a house considering the connectivity and transportation facilities to your new house as mentioned below? *

Mark only one oval per row.

	Yes	No
Connectivity to Pune-Mumbai connecting corridor	☐	☐
Bus Stops	☐	☐
Railway Station	☐	☐
BRT Corridor	☐	☐
Metro Station / Proposed Shivajinagar-Hinjewadi Metro line	☐	☐
Airport	☐	☐
Connectivity to main city roads	☐	☐
Connectivity to Pune City through proposed Ring road /direct highways	☐	☐
Connectivity to PCMC through Proposed Ring Road/direct highways	☐	☐
Connectivity to other parts of PMR through Proposed Ring Road/direct highways	☐	☐
Connectivity to Proposed Pune Ring Road	☐	☐

Connectivity to Pune-Mumbai connecting corridor	☐	☐	☐	☐
Bus Stops	☐	☐	☐	☐
Railway Station	☐	☐	☐	☐
BRT Corridor	☐	☐	☐	☐
Metro Station / Proposed Shivajinagar-Hinjewadi Metro line	☐	☐	☐	☐
Airport	☐	☐	☐	☐
Connectivity to main city roads	☐	☐	☐	☐
Connectivity to Pune City through proposed Ring road /direct highways	☐	☐	☐	☐
Connectivity to PCMC through Proposed Ring Road/direct highways	☐	☐	☐	☐
Connectivity to other parts of PMR through Proposed Ring Road/direct highways	☐	☐	☐	☐

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Road/direct
highways

Connectivity to
Proposed Pune
Ring Road11

☐ ☐ ☐ ☐ ☐

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FACTORS AFFECTING HOME BUYER'S PREFERENCES OF BUYING A HOUSE IN PUNE METROPOLITAN REGION

36. 34. What were your housing preferences considering the travel time to following amenities, facilities and services around the house? *

(Note: If you are filling the form from your mobile phone, slide to the right-left to see the titles of the columns)

Mark only one oval per row.

	0-15 minutes walking	15-30 minutes Driving Distance	30-60 minutes Driving Distance	More than 60 minutes Driving Distance	Not Applicable
a) Convenience stores	☐	☐	☐	☐	☐
b) Entertainment centers like multiplexes	☐	☐	☐	☐	☐
c) Commercial activities like restaurants and shopping malls	☐	☐	☐	☐	☐
d) Day care center for children	☐	☐	☐	☐	☐
e) School/College/Educational Institution	☐	☐	☐	☐	☐
f) Work place	☐	☐	☐	☐	☐
g) hospitals and other health care facilities	☐	☐	☐	☐	☐

35. 33. Did you prefer to buy a house considering amenities, facilities and services around the house as mentioned below? *

Mark only one oval per row.

	Yes	No
a) Convenience stores	☐	☐
b) Entertainment centers like multiplexes	☐	☐
c) Commercial activities like restaurants and shopping malls	☐	☐
d) Day care center for children	☐	☐
e) School/College/Educational Institution	☐	☐
f) Work place	☐	☐
g) hospitals and other health care facilities	☐	☐

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37. 35. Did you prefer to buy house considering Architectural Design and planning of housing projects as mentioned below? *

Mark only one oval per row.

	Yes	No
a) Natural Ventilation	☐	☐
b) Natural Daylight	☐	☐
c) Views from the house	☐	☐
d) size/area and typology	☐	☐
e) Any Other: physical modifications, Information technology, Vastushastra	☐	☐

38. 36. While buying a new house , how did you rate your housing preferences considering Architectural Design and planning of housing projects ? Do you agree that following factors are important ? *

(Note: If you are filling the form from your mobile phone, slide to the right-left to see the titles of the columns)

Mark only one oval per row.

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
a) Natural Ventilation	☐	☐	☐	☐	☐
b) Natural Daylight	☐	☐	☐	☐	☐
c) Views from the house	☐	☐	☐	☐	☐
d) size/area and typology	☐	☐	☐	☐	☐
e) Any Other: physical modifications, Information technology, Vastushastra	☐	☐	☐	☐	☐

39. 37. Did you prefer to buy a house considering Quality of residential environment and surroundings ? *

Mark only one oval per row.

	Yes	No
a) A green space like public garden	☐	☐
b) children play area	☐	☐
c) jogging track	☐	☐
d) the neighborhood which is away from city traffic, pollution and congested areas.	☐	☐
e) amenities like swimming pool, gym and club house	☐	☐
f) services and facilities like parking, lift, and 24X7 water supply, Security	☐	☐
g) not in the close proximity to slums	☐	☐
h) not in the close proximity to crematoriums or burial grounds	☐	☐
i) Neighborhood which have good visual appearance	☐	☐
j) Locality which has scope for real estate and urban infrastructure development in near future	☐	☐
k) Green buildings/Energy efficient housing	☐	☐

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FACTORS AFFECTING HOME BUYER'S PREFERENCES OF BUYING A HOUSE IN PUNE METROPOLITAN REGION

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FACTORS AFFECTING HOME BUYER'S PREFERENCES OF BUYING A HOUSE IN PUNE METROPOLITAN REGION

40.

38. While buying a new house , how did you rate your housing preferences considering Quality of residential environment and surroundings ? Do you agree that following factors are important ? *

(Note: If you are filling the form from your mobile phone, slide to the right-left to see the titles of the columns)

Mark only one oval per row.

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
a) A green space like public garden	☐	☐	☐	☐	☐
b) children play area	☐	☐	☐	☐	☐
c) jogging track	☐	☐	☐	☐	☐
d) the neighborhood which is away from city traffic, pollution and congested areas.	☐	☐	☐	☐	☐
e) amenities like swimming pool, gym and club house	☐	☐	☐	☐	☐
f) services and facilities like parking, lift, and 24x7 water supply, Security	☐	☐	☐	☐	☐
g) not in the close proximity to slums	☐	☐	☐	☐	☐
h) not in the close proximity to crematoriums or burial grounds	☐	☐	☐	☐	☐
i) Neighborhood which have good visual appearance	☐	☐	☐	☐	☐
j) Locality which has scope for real estate and urban infrastructure development in near future	☐	☐	☐	☐	☐
k) Green buildings/Energy efficient housing	☐	☐	☐	☐	☐

41.

39. Did you prefer to buy a house considering Social Aspects. as mentioned below ? *

Mark only one oval per row.

	Yes	No
a) Status of education of residents in the residential	☐	☐
b) profession of residents in the residential area	☐	☐
c) near to locality where your relatives and friends are living	☐	☐
d) Health requirements of elders in the house.	☐	☐

42.

40. What Status of education of residents in the residential area you preferred while buying a new house? *

Mark only one oval.

☐ Highly educated
☐ Average educated
☐ Lower educated
☐ Not any specific

43.

41. What kind of profession of residents in the residential area you preferred, while buying a new house? (you can select more than one) *

Tick all that apply.

☐ Service
☐ Business
☐ Any other
☐ Not any specific

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FACTORS AFFECTING HOME BUYER'S PREFERENCES OF BUYING A HOUSE IN PUNE METROPOLITAN REGION

40.

38. While buying a new house , how did you rate your housing preferences considering Quality of residential environment and surroundings ? Do you agree that following factors are important ? *

(Note: If you are filling the form from your mobile phone, slide to the right-left to see the titles of the columns)

Mark only one oval per row.

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
a) A green space like public garden	☐	☐	☐	☐	☐
b) children play area	☐	☐	☐	☐	☐
c) jogging track	☐	☐	☐	☐	☐
d) the neighborhood which is away from city traffic, pollution and congested areas.	☐	☐	☐	☐	☐
e) amenities like swimming pool, gym and club house	☐	☐	☐	☐	☐
f) services and facilities like parking, lift, and 24x7 water supply, Security	☐	☐	☐	☐	☐
g) not in the close proximity to slums	☐	☐	☐	☐	☐
h) not in the close proximity to crematoriums or burial grounds	☐	☐	☐	☐	☐
i) Neighborhood which have good visual appearance	☐	☐	☐	☐	☐
j) Locality which has scope for real estate and urban infrastructure development in near future	☐	☐	☐	☐	☐
k) Green buildings/Energy efficient housing	☐	☐	☐	☐	☐

41.

39. Did you prefer to buy a house considering Social Aspects. as mentioned below ? *

Mark only one oval per row.

	Yes	No
a) Status of education of residents in the residential	☐	☐
b) profession of residents in the residential area	☐	☐
c) near to locality where your relatives and friends are living	☐	☐
d) Health requirements of elders in the house.	☐	☐

42.

40. What Status of education of residents in the residential area you preferred while buying a new house? *

Mark only one oval.

☐ Highly educated
☐ Average educated
☐ Lower educated
☐ Not any specific

43.

41. What kind of profession of residents in the residential area you preferred, while buying a new house? (you can select more than one) *

Tick all that apply.

☐ Service
☐ Business
☐ Any other
☐ Not any specific

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44.	42. How did you rate your preference to buy a house near to the locality where your relatives and friends are living? *	48.	46. Do you own a vehicle for a daily commuting ? What vehicle you have ? (two wheeler/four wheeler) *
Mark only one oval.			
☐ Strongly Agree ☐ Agree ☐ Undecided ☐ Disagree ☐ Strongly Disagree			
45.	43. What health care facilities did you want nearby your house? (you can select more than one) *		
Tick all that apply			
☐ Clinics ☐ Nursing homes ☐ Multispeciality hospitals			
46.	44. Do you currently stay in your new house that you have recently bought? (please Answer as Yes/No) If no then please give address of your current house.		
47.	45. Please explain if there is any difference between your preferences before buying a house and what actually you have got after buying a new house. *		

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FACTORS AFFECTING HOME BUYER'S PREFERENCES OF BUYING A HOUSE IN PUNE METROPOLITAN REGION

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49.

47. Rank your preferences on the scale of 1 to 5

Mark only one oval per row.

	1	2	3	4	5	NA
1. Connectivity and transportation	☐	☐	☐	☐	☐	☐
2. amenities, facilities and services (convenience store, shopping malls, entertainment centres, etc.)	☐	☐	☐	☐	☐	☐
3. factors related Economy (cost, resale price, loan , EMI , carpet area, etc.)	☐	☐	☐	☐	☐	☐
4. Social Aspects (education status, profession , etc.)	☐	☐	☐	☐	☐	☐
5. Architectural Design and planning of housing projects	☐	☐	☐	☐	☐	☐
6. Quality of residential environment and surroundings (garden, children play area, swimming pool, gym, etc.)	☐	☐	☐	☐	☐	☐
7. Location/locality	☐	☐	☐	☐	☐	☐
8. Typology (1bhk/2bhk, etc.)	☐	☐	☐	☐	☐	☐

50.

48. Can you please give contact numbers of few people from your contacts/relatives/friends, etc. who have bought a house in the last five years?

(This is not compulsory)

51.

I have read the covering note of this survey form and I am aware about the objective of this survey. I am aware that the data collected through this survey will be used for the academic purpose. I am aware that the collected data will be used for research publications/ Research papers in seminars, conferences, journals and PhD research thesis. I am aware that my identity will not be disclosed and it will be kept private and anonymous. I ensure that information provided by me is true. *

Mark only one oval.

☐ I agree to participate in this study by filling true information in above survey form.

TYPE B

Home Buyer who is willing to buy a house in the next five years

52.

1. Name of Housing Society/Housing project, etc. where you are living currently *

53.

2. Location (Give name of the location of housing society where you live in Pune Metropolitan Region, eg. Sadashivpeth, Kothrud, Pimpri, Hinjewadi etc.) *

54.

3. Town *

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55. 4.City *		62. 11. Marital Status *	Mark only one oval. ☐ Married ☐ Single ☐ Divorced ☐ widow/widower
56. 5. Pin-code *		63. 12. Phase of family life cycle *	Mark only one oval. ☐ Unattached Adult ☐ Young Married with no children ☐ Childbearing family with pre-school children ☐ Childbearing family with school children ☐ Childbearing family with teenagers ☐ About to retirement ☐ retirement / Senior years ☐ Other:
57. 6.District *		64. 13. Education *	Mark only one oval. ☐ No formal Education ☐ SSC (10th standard) ☐ HSC (12th standard) ☐ Diploma/any other equivalent course ☐ Graduation ☐ Post Graduation ☐ Mphil ☐ PhD ☐ Other:
58. 7. Name of the Respondent *			
59. 8. Contact number *			
60. 9. Age *			
61. 10. Gender *	Mark only one oval. ☐ Female ☐ Male		

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65. 14. Occupation *	Mark only one oval. ☐ Service ☐ Business ☐ Any Other	70. 19. What is your comment on the house that you want to buy in near future? *	_____ _____ _____ _____															
66. 15. Annual family Income *	(In case of married, if husband and wife both are working then add income of both) _____	71. 20. What two factors do you care the most while making a home buying decision? *	(Explain two things/factors/thoughts about which you are the most concerned when you are deciding to buy a house) _____ _____ _____ _____															
67. 16. What is the Price of your current house? *	_____																	
68. 17. When will you buy a new residence? (tentative month and year) *	_____																	
69. 18. Why do you want to buy a new house? *	(Explain your reasons for buying a new house) _____ _____ _____ _____	72. 21. Will you buy a new house considering following Housing Preferences related finance? *	Mark only one oval per row. <table border="1"> <thead> <tr> <th></th> <th>Yes</th> <th>NO</th> </tr> </thead> <tbody> <tr> <td>a. Renting out possibility</td> <td>☐</td> <td>☐</td> </tr> <tr> <td>b. Larger house at affordable price in suburban area</td> <td>☐</td> <td>☐</td> </tr> <tr> <td>c. Good resale value</td> <td>☐</td> <td>☐</td> </tr> <tr> <td>d. Tax benefit on loan</td> <td>☐</td> <td>☐</td> </tr> </tbody> </table>		Yes	NO	a. Renting out possibility	☐	☐	b. Larger house at affordable price in suburban area	☐	☐	c. Good resale value	☐	☐	d. Tax benefit on loan	☐	☐
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a. Renting out possibility	☐	☐																
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d. Tax benefit on loan	☐	☐																

11/1/21, 4:38 PM	FACTORS AFFECTING HOME BUYERS PREFERENCES OF BUYING A HOUSE IN PUNE METROPOLITAN REGION	11/1/21, 4:38 PM	FACTORS AFFECTING HOME BUYERS PREFERENCES OF BUYING A HOUSE IN PUNE METROPOLITAN REGION									
73. 22. What Housing Price will you prefer? *	Tick all that apply. ☐ Rs. 10 lac – 50 lacs ☐ Rs. 51 lac – 1 crore ☐ Above Rs. 1 crore Other:	77. 26. What family size will you consider while buying a new house? *	Mark only one oval. ☐ One person ☐ Two persons ☐ Three persons ☐ Four persons ☐ Five persons ☐ More than five persons									
74. 23. How much housing loan will you preferred? *	Mark only one oval. ☐ less than 10 lacs ☐ Rs. 10 lac – 50 lacs ☐ Rs. 51 lac – 1 crore ☐ Above Rs. 1 crore	78. 27. What typology of house will you prefer while buying a new house? *	Mark only one oval. ☐ 1 RK/Low cost housing ☐ Studio apartment ☐ 1BHK apartment ☐ 2BHK apartment ☐ 3BHK apartment ☐ Duplex Flat ☐ Row house ☐ Bungalow plot ☐ Other:									
75. 24. How much EM of housing loan will you prefer per month? *	Mark only one oval. ☐ Rs. 0 - 25,000 ☐ Rs. 25,000 - 50,000 ☐ Rs. 50,000 - 1 lac ☐ more than Rs. 1 lac	79. 28. What can be the area of the new house that you want to buy? *	Tick all that apply. ☐ 200 sq.ft. – 500sq.ft ☐ 501 sq.ft. – 800 sq.ft ☐ 801 sq.ft – 1100 sq.ft ☐ 1101 sq.ft – 1400 sq.ft ☐ Above 1400 sq.ft Other:									
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a. Specific Housing Size	☐	☐										
b. bigger size of house for growing family size	☐	☐										

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FACTORS AFFECTING HOME BUYER'S PREFERENCES OF BUYING A HOUSE IN PUNE METROPOLITAN REGION

80.

29. Will you prefer to buy a new house because you want to stay at the specific location in Pune Metropolitan region? *

Mark only one oval

☐ Yes

☐ No

81.

30. Which location in Pune metropolitan region will you prefer for a new house? *

82.

31. Why do you prefer above mentioned location for a new house?

83.

32. Will you prefer to buy a house considering the connectivity and transportation facilities to your new house as mentioned below? *

Mark only one oval per row

	Yes	No
Connectivity to Pune-Mumbai connecting corridor	☐	☐
Bus Stops	☐	☐
Railway Station	☐	☐
BRT Corridor	☐	☐
Metro Station / Proposed Shivalinagar-Hinjewadi Metro Line	☐	☐
Airport	☐	☐
Connectivity to main city roads	☐	☐
Connectivity to Pune City through proposed Ring road /direct highways	☐	☐
Connectivity to PCMC through Proposed Ring Road/direct highways	☐	☐
Connectivity to other parts of PMR through Proposed Ring Road/direct highways	☐	☐
Connectivity to Proposed Pune Ring Road	☐	☐

84. 33. What will be your housing preferences considering the travel time to following connectivity and transportation facilities from a new house? *

(Note: If you are filling the form from your mobile phone, slide to the right-left to see the titles of the columns)

Mark only one oval per row.

	0-15 minutes walking	15-30 minutes Driving Distance	30-60 minutes Driving Distance	More than 60 minutes Driving Distance	Not Applicable
Connectivity to Pune-Mumbai connecting corridor	☐	☐	☐	☐	☐
Bus Stops	☐	☐	☐	☐	☐
Railway Station	☐	☐	☐	☐	☐
BRT Corridor	☐	☐	☐	☐	☐
Metro Station / Proposed Shivajinagar-Hinjewadi Metro line	☐	☐	☐	☐	☐
Airport	☐	☐	☐	☐	☐
Connectivity to main city roads	☐	☐	☐	☐	☐
Connectivity to Pune City through proposed Ring road / direct highways	☐	☐	☐	☐	☐
Connectivity to PCMC through Proposed Ring Road/direct highways	☐	☐	☐	☐	☐
Connectivity to other parts of PMR through Proposed Ring	☐	☐	☐	☐	☐

85. 34. will you prefer to buy a house considering amenities, facilities and services around the house as mentioned below? *

Mark only one oval per row.

	Yes	No
a) Convenience stores	☐	☐
b) Entertainment centers like multiplexes	☐	☐
c) Commercial activities like restaurants and shopping malls	☐	☐
d) Day care center for children	☐	☐
e) School/College/Educational Institution	☐	☐
f) Work place	☐	☐
g) hospitals and other health care facilities	☐	☐

86. 35. What will be your housing preferences considering the travel time to following amenities, facilities and services around the house? *

(Note: If you are filling the form from your mobile phone, slide to the right-left to see the titles of the columns)

Mark only one oval per row.

	0-15 minutes walking	15-30 minutes Driving Distance	30-60 minutes Driving Distance	More than 60 minutes Driving Distance	Not Applicable
a) Convenience stores	☐	☐	☐	☐	☐
b) Entertainment centers like multiplexes	☐	☐	☐	☐	☐
c) Commercial activities like restaurants and shopping malls	☐	☐	☐	☐	☐
d) Day care center for children	☐	☐	☐	☐	☐
e) School/College/Educational Institution	☐	☐	☐	☐	☐
f) Work place	☐	☐	☐	☐	☐
g) hospitals and other health care facilities	☐	☐	☐	☐	☐

87. 36. Will you prefer to buy house considering Architectural Design and planning of housing projects as mentioned below? *

Mark only one oval per row.

	Yes	No
a) Natural Ventilation	☐	☐
b) Natural Daylight	☐	☐
c) Views from the house	☐	☐
d) size/area and typology	☐	☐
e) Any Other physical modifications, Information technology, Vastushastra	☐	☐

88. 37. While buying a new house , how will you rate your housing preferences considering Architectural Design and planning of housing projects ? Do you agree that following factors are important ? *

(Note: If you are filling the form from your mobile phone, slide to the right-left to see the titles of the columns)

Mark only one oval per row.

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
a) Natural Ventilation	☐	☐	☐	☐	☐
b) Natural Daylight	☐	☐	☐	☐	☐
c) Views from the house	☐	☐	☐	☐	☐
d) size/area and typology	☐	☐	☐	☐	☐
e) Any Other physical modifications, Information technology, Vastushastra	☐	☐	☐	☐	☐

89. 38. Will you prefer to buy a house considering **Quality of residential environment** and surroundings ? *

Mark only one oval per row.

	Yes	No
a) A green space like public garden	☐	☐
b) children play area	☐	☐
c) jogging track	☐	☐
d) the neighborhood which is away from city traffic, pollution and congested areas.	☐	☐
e) amenities like swimming pool, gym and club house	☐	☐
f) services and facilities like parking, lift, and 24X7 water supply, Security	☐	☐
g) not in the close proximity to slums	☐	☐
h) not in the close proximity to crematoriums or burial grounds	☐	☐
i) Neighborhood which have good visual appearance	☐	☐
j) Locality which has scope for real estate and urban infrastructure development in near future	☐	☐
k) Green buildings/Energy efficient housing	☐	☐

90. 39. While buying a new house , how will you rate your housing preferences considering **Quality of residential environment and surroundings** ? Do you agree that following factors are important ? *

(Note: If you are filling the form from your mobile phone, slide to the right-left to see the titles of the columns)

Mark only one oval per row.

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
a) A green space like public garden	☐	☐	☐	☐	☐
b) children play area	☐	☐	☐	☐	☐
c) jogging track	☐	☐	☐	☐	☐
d) the neighborhood which is away from city traffic, pollution and congested areas.	☐	☐	☐	☐	☐
e) amenities like swimming pool, gym and club house	☐	☐	☐	☐	☐
f) services and facilities like parking, lift, and 24X7 water supply, Security	☐	☐	☐	☐	☐
g) not in the close proximity to slums	☐	☐	☐	☐	☐
h) not in the close proximity to crematoriums or burial grounds	☐	☐	☐	☐	☐
i) Neighborhood which have good visual appearance	☐	☐	☐	☐	☐
j) Locality which has scope for real estate and urban infrastructure development in near future	☐	☐	☐	☐	☐
k) Green buildings/Energy efficient housing	☐	☐	☐	☐	☐

94. 43. How will you rate your preference to buy a house near to the **locality** where your **relatives** and friends are **living**? *

Mark only one oval.

☐ Strongly Agree

☐ Agree

☐ Undecided

☐ Disagree

☐ Strongly Disagree

clinics

☐ Multispeciality hospitals

☐ Clinics

☐ Nursing

☐ Multispe

97. 46. Do you own a vehicle for a daily commuting? What vehicle you have? (two wheeler/four wheeler) *

11/1/21, 4:36 PM

FACTORS AFFECTING HOME BUYER'S PREFERENCES OF BUYING A HOUSE IN PUNE METROPOLITAN REGION

11/1/21, 4:36 PM

FACTORS AFFECTING HOME BUYER'S PREFERENCES OF BUYING A HOUSE IN PUNE METROPOLITAN REGION

98.

47. Rank your preferences on the scale of 1 to 5

Mark only one oval per row.

	1	2	3	4	5	NA
1. Connectivity and transportation	☐	☐	☐	☐	☐	☐
2. amenities, facilities and services (convenience store, shopping malls, entertainment centres, etc.)	☐	☐	☐	☐	☐	☐
3. factors related Economy (cost, resale price, loan , EMI , carpet area, etc.)	☐	☐	☐	☐	☐	☐
4. Social Aspects (education status, profession , etc.)	☐	☐	☐	☐	☐	☐
5. Architectural Design and planning of housing projects	☐	☐	☐	☐	☐	☐
6. Quality of residential environment and surroundings (garden, children play area, swimming pool, gym, etc.)	☐	☐	☐	☐	☐	☐
7. Location/locality	☐	☐	☐	☐	☐	☐
8. Typology (1bhk/2bhk, etc.)	☐	☐	☐	☐	☐	☐

99.

48. Can you please give contact numbers of few people from your contacts/relatives/friends, etc. who are going to buy a house in the next five years?

(This is not compulsory)

100.

I have read the covering note of this survey form and I am aware about the objective of this survey. I am aware that the data collected through this survey will be used for the academic purpose. I am aware that the collected data will be used for research publications/ Research papers in seminars, conferences, journals and PhD research thesis. I am aware that my identity will not be disclosed and it will be kept private and anonymous. I ensure that information provided by me is true. *

Mark only one oval.

☐ I agree to participate in this study by filling true information in above survey form.

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