



Original scientific paper

Assessing Key Factors Influencing Rental Housing Choices and Affordability for Economically Weaker Sections (EWS): A Neighborhood Study in Delhi

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ABSTRACT



The Economically Weaker Section (EWS) is constrained to live in slums and unauthorized colonies due to the lack of suitable housing options and affordability issues. Various factors such as building characteristics, financial constraints, and social considerations influence individuals' decisions regarding accommodation. A neighborhood in Delhi was chosen for a study to assess the importance of these factors for the EWS in rental housing. A total of 383 sample surveys were carried out to examine the socioeconomic variables and key factors influencing their choice of location, supplemented by 10 in-depth interviews to uncover hidden factors not typically found in existing literature. Principal Component Analysis was employed to identify the most crucial factors influencing accommodation choices. The study findings indicate that while the physical, locational, and economic aspects of rental housing are crucial, social factors also play a significant role. This research will offer invaluable insights to urban planners and policymakers to facilitate the provision of rental housing based on individual preferences in formulating housing policies.

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Highlights:

- Social linkages significantly influence EWS rental housing choices in Delhi.
- Housing characteristics like type and condition affect affordability and choices for EWS households.
- Proximity to neighbourhood amenities plays a crucial role in EWS rental housing selection.
- Government subsidies and schemes significantly impact EWS housing decisions.

Contribution to the field statement:

This study contributes to the literature by addressing a gap in understanding the rental housing choice factors for economically weaker sections. It emphasises the importance of social factors in decision-making, highlighting the need to consider user perspectives in urban housing policies. The findings reveal that social factors are crucial, in advancing knowledge of affordable housing dynamics.

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1. Introduction

Comprehending the significance of choice determinants in the provision of cost-effective rental housing for low-income individuals is crucial in addressing the housing requirements of marginalized communities residing in urban regions (Opoku & Abdul-Muhmin, 2010). The importance of choice as a determinant in the provision of affordable rental housing for economically disadvantaged groups in urban areas is of utmost importance, given its direct influence on the quality of life of numerous vulnerable individuals (Ezennia & Hoskara, 2019). While formal housing markets cater to the needs of middle and high-income groups, low-income individuals often rely on informal rental housing, such as slums and unauthorized settlements, which accommodate a substantial portion of the urban poor (Ren, 2017). The 2011 Census revealed that 13 million households reside in such slums, comprising 17% of the total urban population, highlighting the critical role of informal housing in sheltering those who cannot access formal housing options. However, the living conditions in these settlements are often substandard, with issues like overcrowding, poor ventilation, inadequate water supply, and lack of sanitation, exacerbating the challenges faced by the urban poor (Azmi & Bujang, 2021, Tiwari et al 2016). This situation is further compounded by over 11 million homes remaining vacant across urban India, illustrating a significant disconnect between housing availability and affordability (Kundu et al., 2012). The absence of formal affordable housing, especially in the form of public rental housing, forces many to live in unsafe and unhealthy environments. By examining the factors influencing rental accommodation choices among vulnerable populations, this research seeks to provide insights that could inform housing policies and strategies, ultimately contributing to the broader goal of "Housing for All". Understanding these choice factors is crucial for developing targeted housing solutions that address the diverse needs of low-income groups, ensuring access to safe, affordable, and decent living conditions in urban areas (Ghumare et al, 2021, Tiwari et al, 2020). Factors such as location, cost, proximity to employment, and access to amenities play a significant role in the housing decisions of low-income households (Ezennia & Hoskara, 2019). Therefore, understanding these choice factors is vital for developing housing policies and strategies that ensure affordable and adequate rental housing options are accessible to the poor (Taiwo et al., 2019). By addressing these factors, policymakers can work towards creating more inclusive and equitable urban environments, ultimately contributing to reducing urban poverty and achieving broader social and economic goals (Mottleson, 2023; Naik, 2015).

a. Urbanization and Housing Supply

Achieving broader social and economic development requires addressing the challenges posed by rapid urbanization. According to the United Nations, as of 2020, over 55% of the global population resides in urban regions, and this percentage is anticipated to rise to approximately 68% by 2050, primarily driven by a surge of around 90% in urbanization across Asia and Africa. By 2050, around 50% of India's population is projected to live in urban areas. Approximately 40% of the global urban growth is projected to occur in informal settlements, leading to increased economic inequality and unhygienic living conditions (UN, 2018, Hoelscher & Aijaz, 2016). Unprecedented rates of urbanization and population growth have made housing affordability a concern around the world (OECD, 2019), while people accommodate themselves in informal housing. Due to rising urbanization in India, the provision of urban housing, both for rental and ownership, has gained importance over the past two decades, with more than one-third of the population now living in urban areas (Kundu et al., 2012; MoHUPA, 2015; Gilbert A. 2016). Housing remains one of the most important factors in an individual's well-being since it has several related aspects that affect one's mental and physical health, as well as socioeconomic and cultural diversity.

The majority of the estimated 24.71 million housing shortage in 2007, and the anticipated 26.53 million needed at the end of the 11th Five Year Plan in India account for the Economically Weaker Section (EWS) and Low-Income Group (LIG) categories. 96 % of the 18-million urban housing shortage in India was confined to LIG and EWS sectors for 2012-17 (Technical Group for the Twelfth Five-Year Plan, TG12). Unofficial estimates, using a similar methodology of calculating housing

need and extending out to include family expansion, obsolescence of existing stock and numbers of the homeless, place the requirement much higher, at 29 million units in 2018 (Roy, D., & ML, M., 2020). The majority of the newly constructed housing stock in metropolitan areas is out of reach for the EWS and LIG sectors (Olayiwola et al (2022) as the developers and private players, in particular, have focused mainly on the luxury, high-end, and upper-mid housing categories due to the profit margins (KPMG Naredco, 2012). The empirical evidence indicates that the affordability gap in urban areas in India affects more than 50% of the urban population (Mukherjee, A. et al, 2020) and the formal housing supply has not kept up with low-income residents' need for affordable housing (Patel B. et.al, 2018). In the challenge of housing, metropolitan areas are facing strong challenges which are home to numerous migrants, the rise in increase of slum population settlements despite governmental efforts signifies it. Thus, by taking up a study in Delhi, an attempt has been made to understand the low-income residents. Housing policies in India have always favoured and glorified the ownership of housing globally. But the market cannot function without rental supply. The private market caters to rental supplies in the formal market for HIG and MIG classes. The question which is tried to be addressed is, "What are the primary choice factors influencing the selection of affordable rental housing among existing options by the EWS?", To delve deeper into this inquiry, the study in Delhi focused on analyzing the key determinants that drive the EWS to choose specific affordable rental housing options over others.

b. Renting as an option and Government Policies

The Indian government's housing policies have historically prioritized home ownership over rental housing, reflecting a deep-rooted cultural and policy bias towards owning property as a symbol of economic stability and social status. The Indian government has implemented an array of schemes and strategies that aim to furnish economically feasible shelter to the underprivileged in urban areas. Such initiatives include the Urban Basic Services for the Poor, Nehru Rozgar Yojana, National Slum Development Programme, Valmiki Ambedkar Awas Yojana, Integrated Housing and Slum Development Programme, National Urban Housing and Habitat Policy, and Pradhan Mantri Awas Yojana. The primary objective of these programs is to provide not only housing but also employment opportunities, skill enhancement, and financial support for self-employment. Moreover, these initiatives offer central assistance for ownership houses, thereby catering to the needs of the urban poor. Interventions for affordable housing focused on ownership, but the private sector found it unattractive due to a lack of government support (Khaire, M., & Jha, S. K., 2022; Mack, 2013). Historically, rental accommodation has not attracted much attention, especially for EWS. It is very recently that the government has given notice to the importance of rental accommodation, especially for low-income migrants. This shift in focus towards rental accommodation for low-income migrants reflects a growing recognition of the diverse housing needs within urban populations and the necessity for comprehensive solutions to address housing insecurity across different socioeconomic groups. Along with ownership-driven housing programs like the Pradhan Mantri Awas Yojana (PMAY), which aims at "addressing the urban housing shortage among the EWS/LIG and MIG categories including the slum dwellers by ensuring a pucca house to all eligible urban households by the year 2022" (MOHUA, 2021), the Ministry of Housing and Urban Affairs has given attention to the provision of rental accommodation by introducing the scheme "Affordable Rental Housing Complexes (ARHCs)" for urban migrants/poor. The reverse migration of the urban poor that resulted in India, especially the EWS/LIG categories during the COVID-19 pandemic, has resulted in governments announcing a sub-scheme under the PMAY with an objective "to provide ease of living to urban migrants/poor in the industrial sector as well as in non-formal urban economy to get access to dignified affordable rental housing close to their workplace" (MOHUA, 2020; Yates et al, 2004). The launch of ARHCs and Model Tenancy Act 2021 aimed to streamline rental housing in India, but issues persist, such as inadequate land supply, lack of housing options, poor infrastructure, and low yield from rentals (KPMG, NAREDCO 2012). Despite these challenges, the implementation of the ARHCs and Model Tenancy Act 2021 marks a significant step towards addressing the longstanding

issues in the rental housing sector in India. Further, it becomes essential for local and national governments to understand and identify the significant factors influencing residential location choice and the tradeoff made (Olanrewaju, A. L., & Woon, T. C., 2019). The lack of attention to rental housing has resulted in a severe shortage of affordable rental units, forcing many to live in informal settlements with inadequate infrastructure and services. Furthermore, rental laws in India have historically been skewed in favour of tenants, discouraging private investment in rental housing. As a result, the rental housing sector remains underdeveloped, with minimal institutional participation, limited availability of quality rental units, and insufficient policy support to address the needs of urban dwellers who rely on rental accommodation. In response, the government has unveiled the 2015 preliminary National Urban Rental Housing Policy and the 2019 preliminary Model Tenancy Act. These initiatives are designed to offer economical rental accommodations to disadvantaged populations such as low-income individuals, daily labourers, and informal sector migrant workers (Roy, D., & ML, M. 2020; Galster, G., 2007).

c. The choice factors

Choices and preferences, though conceptually similar, are operationally distinct in housing studies, with preferences often reflecting desired attributes and choices representing actual decisions made by individuals or household members based on a combination of factors such as affordability, proximity to amenities, and social connections within the community (Aliu, I.R., 2024). Motivational factors such as the physical condition of the environment, home financing, and location accessibility significantly influence housing choices, with variations observed between that purchasing for consumption versus investment purposes (Nugroho et al 2018). Individuals evaluate available alternatives based on the choice's availability, preferences and changing circumstances (David Taiwo, O., & Misnan, S. H., 2020 Peter et al 2011). The state of the national economy also plays a crucial role, as many individuals find housing costs beyond their family budgets, highlighting the need for policy measures like low-cost social housing and subsidies to improve housing delivery systems (Nooraini et al, 2018). The study by Nooraini et al., found that individuals preferred 3-bedroom flats, followed by 2-bedroom flats and self-contained units. Biases in housing search and choice can also be influenced by external factors, such as estate agents acting as choice architects, leading to predictable biases in outcomes (Scott. Et al, 2011). Household resources, restrictions, and housing market opportunities and constraints also shape the choice set for housing options (M Van Hem, 2012). Housing, as an amalgamation of different elements such as tenure, size, style, quality, and (relative) location, forms a complex entity (Ibrahim, 2024). Given that dwellings are composed of multiple characteristics, households have to make trade-offs and compromises when deciding on housing options. The selection of a particular dwelling and its associated set of attributes is contingent upon the specific needs and preferences of households, as well as the practical constraints imposed by available resources, restrictions placed upon them, and the prevailing conditions within the housing market. It is important to acknowledge that some households possess greater capacity to actualize their housing preferences compared to others. Nevertheless, for the majority of households, the realm of choice is severely restricted and confined within specific geographic boundaries (M Van Hem, 2012; Byun, G., & Ha, M., 2016). Olanrewaju et al in their findings state that income among other factors were important, while non-financial determinants including location, security and building is important. Economic factors such as employment, housing prices, income, and expenditure play a crucial role in determining rental affordability (Amos, 2023). Social factors like housing characteristics, access to amenities like day-care and malls, and security are also significant determinants of affordable housing choices (Singla & Bendigiri, 2019). Additionally, environmental factors such as waste management, energy efficiency, materials used in construction, and noise pollution contribute to sustainable housing choices for affordable rentals (Amos, 2023; Abdul, 2018; Ikenna et al, 2019). Waddell (2018) highlights the importance of understanding socioeconomic factors to inform urban policies that reduce segregation and enhance access to amenities. Chen and Jim (2022) emphasize the role of environmental factors in shaping healthier and more sustainable

urban spaces through informed planning. Schwanen (2020) Discusses how understanding transportation needs can guide the development of efficient transit systems and reduce urban sprawl. Clark and Huang (2019) explore how life cycle stages impact mobility, underscoring the need for adaptable housing policies that cater to different life stages. Bischoff & Reardon (2014) analyze how residential choice factors contribute to segregation, advocating for policies that promote social cohesion and equitable urban development. The existing literature covers a wide range of factors that influence choices related to location, sustainability, affordability, and building characteristics. However, there is a lack of in-depth research on the EWS concerning these choice factors. To address this gap, additional choice factors specific to the EWS demographic have been identified from the literature for a more detailed analysis in the study.

d. Theories

Housing choice and preference are influenced by several important theories that help explain the complex decision-making processes involved. One foundational theory is the theory of urban spatial structure, which examines how the spatial arrangement of urban areas affects residential choices and housing quality. Herbert's Residential Choice Decision (RECD) Theory and McFadden's Random Utility (MORE) Theory further elaborate on how individuals make housing decisions based on utility maximization and the trade-offs between different housing attributes (Abraham, 2024; Lents & Ross 1957). In view of the research intended, a few theories are studied which fall in line with the research intended. Clark and Telemann (1996) discussed how life cycle stages significantly influence housing mobility and the demand for different types of housing. They observed that households tend to move as their housing needs change, often seeking more space during the child-rearing phase and downsizing in later life. Additionally, Ross (1980) emphasized that housing adjustments are frequently driven by life events such as marriage, childbirth, and retirement, highlighting the dynamic nature of residential choice throughout the life cycle. These changes are not only influenced by internal household factors but also by external factors such as economic conditions, housing market availability, and urban planning policies. Ajzen's Theory of Planned Behavior has been applied in various studies to understand residential decision-making. For instance, Jansen et al. (2011) used the Theory of Planned Behavior framework to analyze how attitudes, norms, and perceived control affect housing preferences and choices, revealing that these factors significantly influence the types of housing people select, as well as their satisfaction with those choices. Similarly, Coolen and Hoekstra (2001) found that Theory of Planned Behaviour could effectively predict housing choices by examining how these three components interact to shape residential decisions. The planned behavior model, rooted in the expectancy-value theory, explores how behavior is influenced by the expected values of different attributes. De Jong and Fawcett applied this model to migration decision-making in housing studies, assessing the importance of values to calculate an attraction score for specific locations and housing types. Factors like personal backgrounds, structural backgrounds, marital status, and financial capacity impact the decision to move. Decision-making in housing selection is viewed as problem-solving technique to transform complex situations into satisfactory ones, emphasizing goal-oriented behavior for achieving a desired quality of life (Nusrat et al 2023; Quoc et al 2022). In the realm of rental housing, prospective tenants (individuals or households) seek to utilize residential space on the demand side. At the same time, property owners rent out space to tenants on the supply side. Tenants place value on specific spaces within particular locations, while homeowners offer rental properties with distinct features in specific areas. Hence, the market for rental housing is characterized by a high level of segmentation due to its location and type-specific nature. An in-depth analysis of this segmentation can provide insights into the rental housing sector (Jiayi, 2023; Ekaterina, 2022). Firstly, the theory of housing's spatial immobility suggests that locational attributes are inherent to a set of housing characteristics (Azmi & Bujang 2021). Secondly, the durability of housing, differentiating it from other commodities, influences its relatively high cost and its connection to the mortgage market (Assaf et al, 2022). Thirdly, the diverse physical attributes of housing encompass factors such as type, size, age, building materials, exterior and interior

structures, architectural designs, and various forms of land tenure (Opoku & Abdul, 2010). The multifaceted heterogeneity of an urban housing market leads to market segmentation, comprising interconnected yet distinct housing subcategories. The trade-off theory posits that households strive to maximize their utility from owner-occupied or rental housing to balance considerations like job accessibility, as measured by monetary and time costs for commuting to a central workplace and retail areas (Henderson & Ioannides, 1983). Consequently, housing decisions involve a trade-off process influenced by homeowners' or tenants' assessments of housing quality, locational amenities, and accessibility.

2. Materials and Methods

This section discusses the methodology adopted for the study, with a brief description of the case area, descriptive results of the surveys done and analysis performed.

2.1 Methodology

Factors related to the choice have been extensively studied in various contexts within the literature, including the context of EWS. To further explore these factors, a study conducted in-depth interviews with 10 respondents to gain insights into the significance of different aspects of choice factors. This research aimed to introduce additional factors to the existing body of knowledge. The factors selected for inclusion in the study cover a wide range of elements such as Safety, Political Representation, Landlord-tenant relation, Financial Help from relatives, Relative Support, Unit Area, number of rooms, age of building, House Typology, Nearness to parks & playgrounds, Nearness to school, Nearness to hospitals, Nearness to Market, Drainage, Sewerage, Electricity, Water Supply, Solid Waste Management, Expenditure on Food, House rent, Employment Zone, Distance to public transport, Government Scheme Subsidy/scheme (Education/Health), and Subsidy/scheme (Housing). This comprehensive list of factors provides a detailed understanding of the various considerations that influence choices in the context of the EWS, shedding light on the complexity of decision-making processes in this domain.

a. Data Collection and Sampling Technique

The primary data was collected using a convenient sampling technique. Convenience sampling is a non-probability sampling method where the sample is taken from a group of people who are easy to contact or reach. This method was chosen because it allows for quick and easy data collection from respondents who are readily available, accessible, and willing to participate (Sekaran and Bougie, 2010). A total of 383 respondents participated in the survey. This sample size was deemed adequate to achieve enough statistical power and reliability in the results. The respondents included tenants from various locations to ensure a diverse representation of housing preferences and rent patterns.

b. Analysis

Prior to performing any statistical analysis, normalizing the gathered data is crucial. Normalization is a critical pre-processing step that ensures all variables are on a comparable scale. This process is crucial for reducing biases and enhancing the accuracy of subsequent analyses. The normalization process typically involves transforming the data so that the mean of each variable is zero and the standard deviation is one. Descriptive statistics were then calculated to offer a summary of the data and gain insights into the distribution and central tendencies of the variables being studied. Specifically, within the accommodation type, factors such as average expenditure, income, rent paid, and access to amenities were analyzed. Following existing trends in the literature, Principal Component Analysis (PCA) was employed to reduce the dimensionality of the data and identify the key factors influencing housing choices and rent levels. PCA is a statistical technique that transforms the original variables into a smaller set of independent variables called principal components. These components capture the most significant amount of variability present in the dataset. By utilizing PCA, researchers were able to pinpoint the crucial determinants influencing decisions related to housing selection and rental prices.



This approach facilitated a more focused examination of the dataset, enabling a deeper understanding of the factors driving housing choices and rent levels.

2.2 Case Area

Delhi remains one of the first choices for the people of the low-income sector while they migrate in search of employment, mostly informal. In accordance with the projections outlined in the draft of the Master Plan for Delhi 2041 (DDA, 2021; NIUA 2021), the city will require 34.5 lakh new housing units by the year 2041. Among these, 54% will be needed for the EWS and lower-income groups (LIG). A recent analysis on housing and urban development featured in the Economic Survey of Delhi 2016-17 reveals that the number of low-income settlements has been steadily rising for more than 55 years. Presently, these settlements accommodate 6.75 million individuals out of a total population exceeding 9 million residents. These individuals reside in substandard housing, which comprises 695 slum settlements, Jhuggi Jhopri clusters, 1797 unauthorized colonies, and 362 urban villages. The study suggests that Delhi's housing deficit represents nearly half of the housing shortfall in other major Indian metropolitan cities as reported by the Ministry of Housing and Urban Affairs in 2012 and the National Housing Bank in 2018. Around 6343 informal settlements containing approximately 10.20 lakh households were reported to be present in urban Delhi in 2012. The majority of these settlements, about 90%, were situated on public land, predominantly owned by local authorities (46%), the railway sector (28%), and the state government (16%), among others. It was observed that about 74.46% of these settlements were located near residential areas, while 3.36% were adjacent to industrial zones, 0.66% were in close proximity to commercial areas, and the remaining were surrounded by various other types of areas. Furthermore, a significant, 86.74% of the settlements had primary schools situated within a distance of less than 0.5 km (NIUA, 2021). As asserted by Ramudu et al. (2023), the urban center of Delhi houses a mean of 28.5% of the population residing in rental accommodation, a statistic also reported in the Census undertaken in 2011.

Various governmental initiatives have been implemented to cater to housing needs through targeted strategies and enhancements in infrastructure. These initiatives included measures such as clearing squatter settlements through demolition and relocation to resettlement colonies in the 1950s, the Juggu jhopri Clearance scheme which provided 80 sq. mt. plots to eligible squatter families in the 1960s, and the construction of resettlement colonies on the outskirts of urban areas for those displaced from old slums and demolished squatter settlements in the 1960s and 70 (Gupta & Gupta 2017). Additionally, central housing schemes like RAY, BSUP, IHSDP, and PMAY have been carried out to address housing issues in the National Capital Territory of Delhi, focusing on upgrading Jhuggi Jhopri, redeveloping notified slums, and providing public housing for low-income groups (Noopur Gupta, A, 2018). The latest step is the provision of rental accommodation through the Affordable Rental Housing Complexes Scheme where the government started addressing the need for rental housing for the poor after seeing a mass exodus of people during the Covid-19 (MoHUA, 2020; Dubey et al 2022).

The selected site for the study is the Maharani Bagh area which consists of parts of Khazirabad village, Taimoor Nagar, New Friends Colony, and Zakir Nagar. The site falls in the southeastern district of Delhi. The entire case study area consists of 450 Ha and belongs to zone F1. Zone 'F' is identifiable with its low density and green character. This zone is mainly comprised of planned, well-maintained posh residential localities. This also includes rehabilitation colonies and government housing areas. The study area is diverse with an interesting interplay of land use mix, rental characteristics and intermixes of social and economic diverse groups.

The study explores the technical elements interconnected with wide-ranging social aspects; therefore, with a focus on personal decision-making, information is collected from primary resources. The participants were chosen from the Maharani Bagh Area of Delhi which comprises a diverse social mix of people where there are pockets of planned development in the form of Gated Housing Societies, plotted developments for MIG and HIG Groups, and slums- Taimoor Nagar and Batla house along with unauthorized colonies of Khazirabad and Zakir Nagar. The surveys were done with households

residing in the informal settlements and people working in informal occupations like selling fruits, vegetable vendors, workers of restaurants, rickshaw pullers and auto-rickshaw drivers.

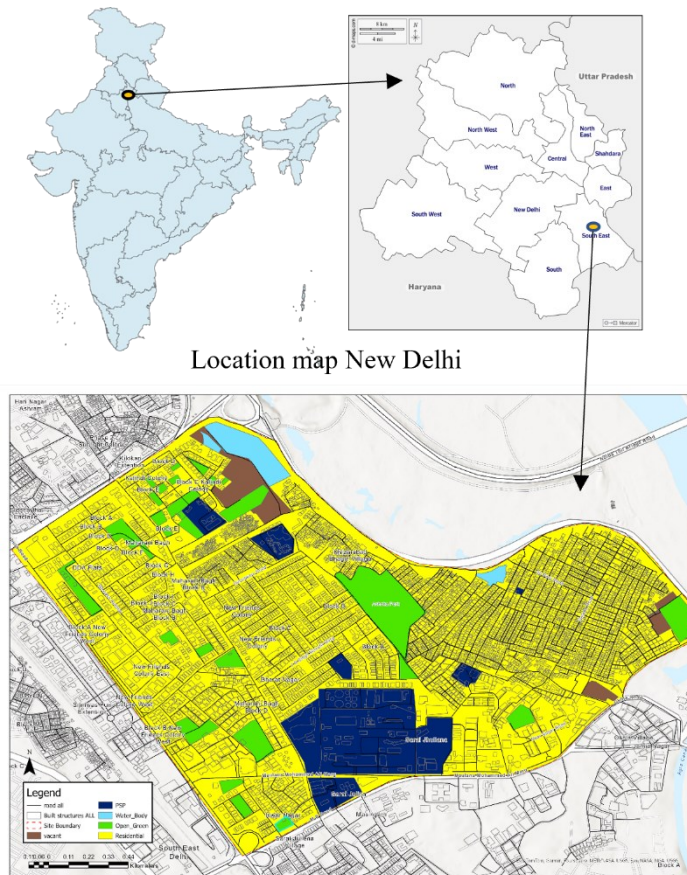


Figure 1. Case Area location map, land use- Maharani Bagh study area.

The case area is characterized by a mix of residential, commercial, and institutional land use. It includes notable landmarks such as Jamia Milia Islamia University, New Friends Colony, and community centre, which serve as key hubs for generating a wide range of informal job opportunities within the community. These areas not only provide essential services and facilities for residents but also contribute to the local economy by fostering informal employment opportunities.

3. Results

The first section of the descriptive analysis delves into a detailed examination of various aspects such as demographics, housing conditions and accessibility of amenities based on the surveys conducted. It provides a comprehensive overview of the characteristics and features related to these areas, offering insights into the current state of the community or population under study. Moving on to the second section, it focuses on the principal component factor analysis. This analytical approach involves identifying the key underlying factors or variables that explain the patterns and relationships within the data. By exploring these principal components, researchers can gain a deeper understanding of the underlying structure and dynamics of the data set, helping to uncover important insights and trends that may not be immediately apparent through traditional analysis methods. Furthermore, the second section delves into the process of extracting and interpreting eigenvalues and eigenvectors, which play a crucial role in determining the significance and contribution of each principal component to the overall variance within the dataset.

3.1 Descriptive Analysis

Demographic profiles of the households:

A total of 383 sample surveys were performed, by using the convenience sampling method using the structured questionnaire survey method. The existing statistics of the slums suggest that the percentage of married people is higher in any informal settlement. A couple of households generally have two earning members and pay a good some of the income on rent while they want to move out of the poor condition of informal settlements and be ready to move out of it. But in the absence of any appropriate supply from the market, they are bound to live in the poor living conditions of informal settlements. Out of 383 samples with the frequency table of households, it can be seen that 75% of the households are composed of up to 4 members. 30% of the households have size 4.

Accommodation: 85 % of the people have stayed in the locality for up to 20 years, one-third of surveyed households have stayed for the last 5 to 10 years and 44 percent have migrated for more than 10 years. More than 50% of the houses have two habitable rooms. The number of rooms is based on counts only which is assumed that the house might have one bedroom and one living room. As presented in Table 1, 65% of the households chose to stay in houses with personal toilets and 35% chose to stay in houses with shared toilets. More than 76 per cent of the households are staying in houses which are up to 20 years old. One-fourth of people live in houses which are even older than 20 years, which shows that, in addition to poor living conditions, the age of buildings is of concern.

Table 1: Type of Accommodation.

S. No.	Type of Accommodation	No.	Percentage
1	House with shared toilet	134	35
2	House with toilet	249	65

Expenditures: As presented in Table 2, the Average income for the households is Rs. 30483.03. The average expenditure on accommodation is Rs. 4368.15 while spending approximately Rs.1000 on electricity(monthly), Rs. 100 on water, Rs. 1442.48 on health, Rs. 873.76 on travel, a good sum of Rs. 53953.13 on an average is spent on education. Education stands as one of the most important expenditures with the rise in awareness of education.

Table 2: Average Expenditure details and income.

	Rent	Exp_acc ommodat ion	Exp_Electric ity	Exp_Water	Exp_Health care	Exp_ Travel	Exp_Edu_A nnual	Income
Mean	5112.27	4368.15	982.25	119.08	1442.48	873.76	53953.1	30483.03
Std. Dev	2409.99	1981.98	963.73	318.34	3730.45	911.61	41678.9	15223.95
Minimum	1500	1500	0	0	0	0	0	10000
Maximum	10000	10000	7000	3000	70000	6000	400000	60000

Table 3 presents the rents paid by the households. 67.624 % of the households, approximately two-thirds of the households are paying rent up to Rs 6000. 24.8% of households paying rent between Rs 6000 to Rs 9000. And 7.5 per cent of the people are also paying rent more than Rs. 9000.

Table 3: Rent paid.

Rent (in Rs)	Frequency	Per cent	Cumulative Percent
<3000	70	18.277	18.277
3000- 6000	189	49.347	67.624
6000-9000	95	24.804	92.428
>9000	29	7.572	100
Missing	0	0	
Total	383	100	

92.17% of people earn up to Rs.40000, 7.83% of people earn more than Rs. 40000, and one-third of people earn between RS. 10000- 15000.

Access to amenities: As presented in Table 4, for at least 50% of the households, the hospital, schools, playgrounds, and religious places are within the range of 1.5 km. For 80% of the household's general store is within a radius of 500 meters. The police station is available within 2 km range.

Table 4: Distance of amenities.

Distance range	Hospital/Clinic	School	General Store	Playground	Police	Community Place	Religious place
<500	85	75	306	88	22	53	158
500-1500	197	191	48	181	45	87	198
1500-2500	76	92	14	81	208	173	19
2500-4500	17	15	13	28	96	54	6
6000	8	10	2	5	12	16	2
Total	383	383	383	383	383	383	383

3.2 Principal Component Analysis

Principal component analysis, known as PCA, is a technique for reducing the dimensionality of extensive datasets by transforming a multitude of variables into a smaller set that retains the majority of the original information. The primary objective of conducting this analysis is to pinpoint the key components that play a pivotal role in decision-making processes among married couples affiliated with the EWS. Upon examination of Table 5, it is evident that the Kaiser-Meyer-Olkin Measure of Sampling Adequacy exceeds the threshold of .7, indicating the presence of an adequate number of items for each factor within the analysis. Furthermore, the statistical significance level falls below .05, thereby establishing the significance of Bartlett's test in this context.

Table 5: KMO and Bartlett's Test.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.782
Bartlett's Test of Sphericity	Approx. Chi-Square	17863.941
df		253
Sig.		0.000

After performing PCA, the positive Eigenvalues and the scree plot suggest the most important 7 components which are relatively important for the study.

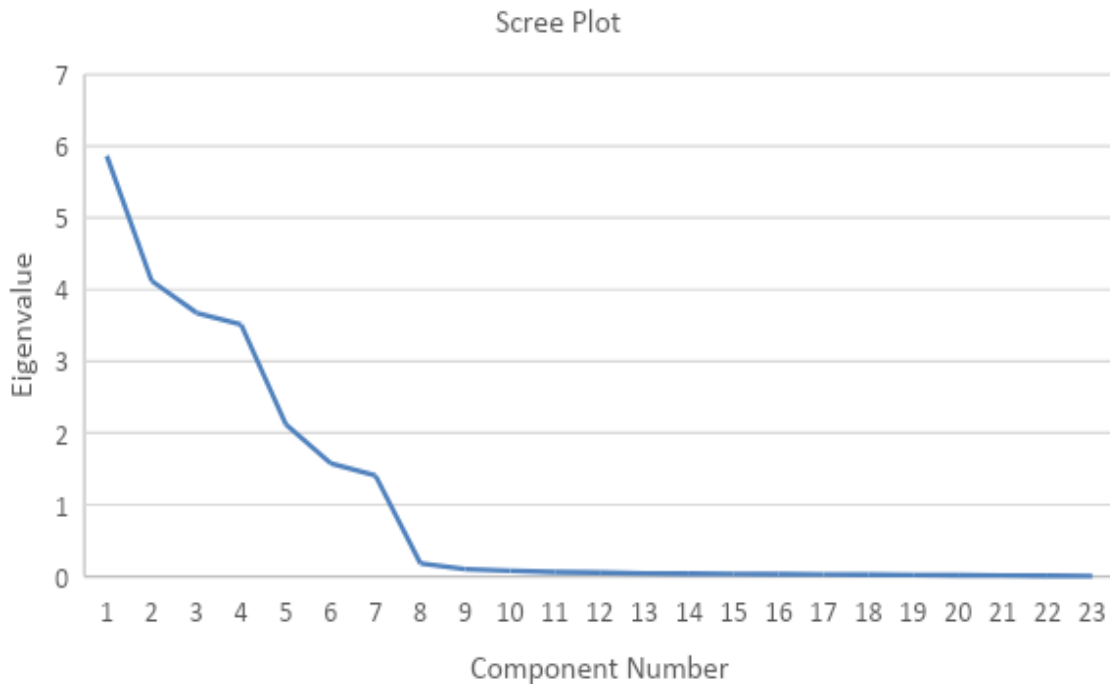


Figure 2. Scree Plot.

Table 6: Rotated Component Matrix.

Component							
	1	2	3	4	5	6	7
Safety	0.972						
Political Representation	0.971						
Landlord-tenant relation	0.968						
Financial_Help from relatives	0.967						
Relative_Support	0.916						
Unit Area		0.974					
Number of rooms		0.970					
Age of building		0.969					
House_Typology		0.959					
Nearness to parks & playgrounds			0.984				
Nearness to school			0.981				
Nearness to hospitals			0.981				
Factor_Market			0.977				
Drainage Sewerage				0.981			
Electricity				0.977			
WaterSupply				0.971			
Solid Waste Management				0.970			
Expenditure on Food					0.991		
House rent					0.991		
Employment Zone						0.971	
Distance_publictransport						0.970	
Government Scheme Subsidy/ scheme (Education/ Health)							0.964
Subsidy/ scheme (Housing)							0.964
Extraction Method:	Principal			Component			Analysis.
Rotation Method: Varimax with Kaiser Normalization							

The table presents the Rotated Component Matrix, which is the result of a Principal Component Analysis (PCA) using the Varimax rotation method. The matrix displays the relationships between different components and variables in the study.

a. Components in the Matrix:

- **Component 1:** Variables such as Safety, Political Representation, Landlord-tenant relations, and Financial Help from relatives have high loadings (0.916 to 0.972) on this component.
- **Component 2:** Variables related to Unit Area, Number of Rooms, Age of Building, and Housing Type have significant loadings (0.959 to 0.974) on this component.
- **Component 3:** Variables such as Proximity to Parks/Playgrounds, Schools, Hospitals, and Market Factors show strong associations (0.977 to 0.984) with this component.
- **Component 4:** Variables like Drainage, Sewerage, Electricity, Water Supply, and Waste Management exhibit high loadings (0.970 to 0.981) on this component.
- **Component 5:** Variables related to Expenditure on Food and House Rent are strongly correlated (0.991 to 0.991) with this component.
- **Component 6:** Variables related to the Location of Employment Zone and Public Transport Distance are strongly correlated (0.970 to 0.991) with this component.
- **Component 7:** This component includes variables like Government Scheme Subsidies (Education/Health) and Housing Scheme Subsidies, with loadings of 0.964 to 0.971.

The rotation method used in this analysis is Varimax with Kaiser normalization, which helps simplify the interpretation of the components. The rotation process converged after 5 iterations, indicating that the components are now more orthogonal and easier to interpret in the study.

4. Discussions

The study provides a comprehensive analysis of the key factors influencing rental housing choices among the EWS in a neighborhood in Delhi. The findings from the Principal Component Analysis (PCA) identify seven crucial components that significantly shape these decisions: social factors, housing factors, neighborhood factors, utilities, expenditure on basic needs, location factors, and government subsidies/schemes. Each of these components plays a distinct yet interconnected role in determining the housing choices of the EWS.

Social Factors: Social factors emerged as the most influential component in the housing choice decision-making process. The study reveals that social networks, particularly relationships with relatives and community members, play a critical role for the EWS, especially for newly migrated individuals. In the absence of established social and economic resources, migrants often rely on their social connections to find initial accommodation, employment, and support within the city. This finding underscores the importance of social safety nets and the role of local political representation, which helps in addressing the needs for basic amenities and upholding the rights of the community members. The study also highlights the role of landlords as key stakeholders, influencing both financially and politically the living conditions of the EWS. These insights, which were gleaned from in-depth interviews, provide an original contribution to the literature by revealing the critical role of social relations in the housing choices of the EWS, a factor that is often overlooked in existing studies.

Housing Factors: The study identifies housing characteristics—such as the type of accommodation, age of the building, and building conditions—as significant determinants of rental housing choices. These factors correlate strongly with demographic characteristics, rent affordability, and household preferences. For instance, married couples tend to prefer private accommodations with separate kitchens and toilets, while single households may opt for shared facilities to minimize costs. This pattern aligns with findings from other studies, where affordability and suitability to household size and structure are key considerations in housing decisions (Ezennia & Hoskara, 2019; Tiwari et al., 2020). These factors reflect the fundamental housing needs of EWS households, which are often constrained by limited financial resources and the lack of affordable, decent housing options in the formal market.

Neighborhood Factors: The availability and accessibility of essential services such as hospitals, schools, parks, and markets are critical neighborhood factors influencing housing choices. These amenities contribute to the overall livability of a neighborhood and are particularly important for EWS households, whose limited resources often require them to optimize their location relative to essential services. The presence of such amenities within close proximity supports a diverse and economically integrated community, which is essential for sustaining the social fabric of EWS settlements. This finding is consistent with existing literature, which emphasizes the importance of neighborhood quality and access to services in the housing choices of low-income households (Taiwo et al., 2019; Ghumare et al., 2021).

Utility Factors: Access to utilities, including water supply, sewerage, drainage, and solid waste management, also emerged as a significant determinant in the study. The availability of reliable utilities is a crucial consideration for EWS households, which often reside in informal settlements with inadequate infrastructure. Poor utility services directly impact the quality of life and health of residents, making this factor a vital element in housing choices. This finding aligns with the broader literature on the role of infrastructure and services in housing decisions, which highlights that inadequate access to utilities often drives low-income households to seek better living conditions (Mukherjee et al., 2020; Amos, 2023).

Expenditure on Basic Needs: The study reveals that EWS households tend to prioritize affordable rental accommodation and proximity to areas where basic goods and services, such as food, are inexpensive. This expenditure pattern reflects the economic constraints faced by EWS households, who must balance limited incomes against the need for affordable housing and daily living expenses. This finding is consistent with existing research, which shows that low-income households often have to make trade-offs between housing costs and other essential needs (Nooraini et al., 2018; Olanrewaju et al., 2019).

Location Factors: The location of housing relative to employment opportunities and public transportation options significantly affects the choices of EWS households. As many EWS residents are migrants employed in informal sectors, they often prefer to reside close to their workplaces or in areas with affordable public transportation. This preference minimizes transportation costs and time, which is crucial for households with limited financial resources. The importance of location in housing choices is well-documented in the literature, which identifies accessibility to employment and transportation as key determinants of housing affordability and suitability (Schwanen, 2020; Clark & Huang, 2019).

Government Subsidy and Scheme Factors: The study identifies government schemes and subsidies as another important component influencing housing choices. EWS households often rely on government programs for affordable housing and basic services, especially during times of economic hardship or in the wake of policy changes, such as the Affordable Rental Housing Complexes (ARHCs) introduced post-COVID-19. The role of such schemes in facilitating access to affordable housing highlights the importance of effective policy interventions that target the specific needs of low-income populations. This finding underscores the critical role of public policy in shaping housing outcomes for the urban poor (Yates et al., 2004; Kundu et al., 2012).

In summary, the findings of the study emphasize the complexity of housing choices among the EWS and highlight the interdependence of multiple factors, including social networks, housing characteristics, neighborhood amenities, utility services, basic expenditure needs, location considerations, and government policies. The study contributes to the literature by identifying unique social factors that influence the housing choices of the EWS, offering new insights for urban planners and policymakers to design more inclusive and equitable housing policies.

5. Conclusions

This study provides a detailed analysis of the factors influencing rental housing choices among the EWS in Delhi, highlighting the nuanced decision-making processes that are often overlooked in policy discussions. The findings demonstrate that housing is a multifaceted commodity, encompassing a

range of attributes that cannot be considered in isolation. The study identifies seven key components—social factors, housing characteristics, neighborhood attributes, utility access, expenditure on basic needs, location, and government subsidies—that collectively shape the housing choices of EWS households.

One of the significant contributions of this study is the identification of social factors as a critical determinant of housing choices among EWS households. This finding reveals the reliance on social networks, such as relatives and local community members, for both financial and emotional support, particularly for newly migrated individuals. This aspect, largely absent in existing literature, provides a novel perspective on the housing decisions of low-income groups, emphasizing the need for policies that recognize and leverage these social dynamics.

The study also underscores the importance of housing characteristics and neighborhood attributes, including the availability of essential services and amenities, which are crucial for maintaining a decent quality of life. Utility provisions, expenditure patterns, location relative to employment, and public transportation access further influence housing choices, reflecting the diverse needs and constraints faced by EWS households. These findings align with existing literature, reinforcing the importance of these factors in the housing decisions of low-income populations.

The results highlight a critical gap in current policy frameworks, which often fail to address the specific needs of the EWS. Housing policies tend to focus on the provision of basic housing units without considering the broader socio-economic and cultural context within which these households make their decisions. The study suggests that a more holistic approach, considering factors such as household size, work type, and affordability, is necessary for designing effective housing policies that cater to the diverse needs of EWS households.

In conclusion, this study opens up a discussion on the importance of choice factors for the EWS, providing an opportunity for further research into each of the identified components. As global housing shortages continue to pose challenges, especially for EWS, understanding the unique characteristics and needs of these populations becomes increasingly important. This understanding can inform the development of more inclusive, context-specific housing policies that improve access to affordable and adequate housing, contributing to broader social and economic goals such as poverty reduction, social integration, and urban sustainability. Future research should focus on examining the individual components more deeply to enhance our understanding of the complexities involved in the housing decisions of the urban poor.

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Conflict of interests

The Authors declare that there is no conflict of interest.

Data availability statement

The data that support the findings of this study are available from the corresponding author, [Ekta], upon reasonable request.

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