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# Changing Responsiveness of the Urban Housing Market: Revisiting Indian Metropolitan Scenario

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**Abstract**

This study investigates the correlation between the variables viz. geographical, social, economic and a hybrid of the three; on residential choice. Residential choice includes choice of location, choice of type of dwelling unit and choice of ownership. The target group considered for the study is a middle income group (MIG) with a range of monthly household income between 10,000 to 50,000 Indian Rupees (INR). The motivation of the study lies in finding an optimal and sustainable allocation of land and other resources for residential functions according to the responsiveness of changing urban housing demand in metropolitan cities – particularly for middle income groups.

The other income brackets, namely economically weaker section (EWS), lower income group (LIG) and higher income group (HIG), have been deliberately kept outside the scope of the study as income groups are extremely elastic in India and merit completely different approaches. Thus, affordability and enabling strategies, is of uppermost importance for EWS and LIG, while non-priced items i.e. individual preferences, image of a locality etc. are significant for HIG. Whereas, the mid range with its increasing purchasing power, forms a significant bandwidth in the 1.1 billion population of the country. It is increasingly targeted by the Multi-National-Companies (MNCs) of Fast-Moving-Consumer-Goods (FMCGs), as well as, the housing-market players. The study would be relevant to various actors including among others - policy makers, real estate developers, planners and researchers. It will help policy makers formulate strategies to analyze future growth directions of a city, conditions of urban sprawl and re-densification. It will enable the real estate developers to come up with the right mix of housing typologies as well as their appropriate pricing. It can also provide key inputs to the planners for land use planning and zoning as well as re-evaluation of development control guidelines. The study will also offer a scope to review the changing responsiveness of housing demand to various parameters, over time. The study is based on the research findings carried across two metropolitan cities, Nagpur and Kolkata, over a period of two decades, 1990 -2008.

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## 1 Introduction

Understanding the residential choice of users provides a key insight into the housing demand. Housing demand subjected to housing supply conditions decide the housing price and prices of all other real estate assets, which are coupled with residential activities.

Residents' satisfaction also contributes to the residential choice as people's response to the environment they live in. Here environment refers not only to the physical setting, such as dwelling units, housing developments, and neighborhoods, but also to the social and economic dimensions of such settings (Francescato, 1998).

A brief review of the past studies done on residential location choice indicates emergence of several types of decision-making models i.e. *geographic model*, *economic model* and *social model* - with a wide array of variables used in them. Most of the models are essentially disaggregate in character where a household is taken as a unit for arriving at a choice of residential location. The relative influence of each variable at the household level, has been observed to change according to various factors i.e. city size and structure, disposable income, socio-economic characteristics, family structure, social and cultural values etc.

This study attempts to identify the variables which are significant through case studies in the cities of Nagpur and Kolkata. The study is restricted to households having disposable monthly income between 10,000 INR and 50,000 INR. This segment has been particularly chosen as households lying below this income range, make residential location decisions under captive conditions due to lack of affordability. On the other hand, households lying above this income range do have lot of options to exercise and they constitute a miniscule component of the housing market.

The issue of residents' satisfaction in their housing complexes has been considered at three different levels: the unit level, the cluster level and the neighborhood level. The methodology adopted in studies on residents' satisfaction include among others, Post Occupancy Evaluation through questionnaire surveys, field checking and recording, use of lapse time photography technique and time-use diary entries.

In the following sections, a brief review of various approaches to residential location allocation will be briefly discussed followed by model development, data collection and analysis, model validation along with the policy implications of the outcome.

## 2. Literature Review

Location allocation theories have been in existence since the last century however, efforts have focused on residential location theories only since 1950's. Based upon the relative stress each approach has put on certain group of variables to explain the decisions taken by households for residential location, it can be broadly divided in three distinct categories – Geographic Model, Social Model and Economic Model.

Geographic models have stressed mainly on the parameters of accessibility i.e. distance to work place, shopping destinations, social facilities and amenities along with cost implications based on their mode affordability and choice. Social models have relied mainly on life cycle factors i.e. age and structure of households, neighborhood characteristics, quality of life, environmental pollution, community relations, ethnic and cultural ties and social recognition as the main explanatory variables. Economic models have extensively relied on economic parameters i.e. housing price and its quality, subsidies and taxes, availability of housing finance etc. Some hybrid models have also evolved which have tried to explain residential choice by using a combination of social, economic and geographic variables.

A brief look at the chronological sequence of these models indicates that geographical models received more attention between 1950s and 1970s, when location decisions were believed to be guided only by accessibility parameters. However, social models soon came into prominence by explaining the anomalies which geographical models would simply prefer to call irrational and inefficient choices. Role of qualitative aspects i.e. neighborhood characteristics, demographic structure of households, pollution and crime levels, ethnic and cultural ties etc. played a major role in shaping the residential location decisions. Finally, the economic models gained much desired attention where residential decisions were observed to be influenced not only by accessibility and social parameters but on housing availability, pricing, local government's standpoint on housing taxes, subsidies and tax relief on loans, access to housing finance etc.

There is no doubt that each group of parameters have a role in explaining residential location choices – however, their significance level and relative level of influence vary considerably with the socio-economic, socio-cultural and demographic characteristics of the household.

Discrete choice models using disaggregate data have been the predominant approach for estimation of residential location choices since 1970's. Households choose a single location among a set of alternatives (that is why it is referred as discrete choice) by maximizing their utility function. Utility functions are estimated based on the disaggregate data collected at the household level. Choices exhibited at the disaggregate levels are then aggregated to arrive at the choice for the entire population. Multinomial Logit models in various forms (simple as well as nested) are extensively used for estimation of the utility functions and arrive at the location choice models.

A brief look at the literature available on Resident's satisfaction aspects regard it as one of the live wires that contribute to the overall satisfaction with quality of life. They have indicated that dwelling units and their neighborhoods impinge upon the physical and mental health as well as the economic and social well-being of individuals, families and community. Housing deficit and unmet needs, as perceived by families, are major causes of dissatisfaction, which may lead to serious maladjustment consequences affecting the general well-being of families.

Morris (1978) has said that the reason for this is not the want of shelter, but want of the right kind of shelter. Several studies on satisfaction focus on social, economic, architectural, political, and environmental aspects of the problem. Residents' satisfaction is also not absolute. Residents' satisfaction at a given point of time can be defined only in relative terms.

The approaches tried in different parts of the world in the area of housing satisfaction are well thought-out approaches that find relevance in the Indian urban situation. There are, however, certain additional factors to be incorporated for similar studies in India, especially in the area of low affordability of residents that has a profound influence on housing satisfaction.

Another area of concern that cannot be lost sight of is the climatological considerations enabling housing satisfaction or dissatisfaction. India presents the most diverse climatic conditions and the most erratic rainfall and cloudy conditions compared to most of the nations in the world. The issues and factors for housing satisfaction and their norms, as found relevant in a particular sub-region, may not be applicable in another sub-region. As such it will be extremely difficult to arrive at any common norm that will act as panacea to all urban housing in India.

### 3. Framework of the study

The study focuses on identification of the parameters which are significant in residential location choice and estimate their relative influence on the choice-probability. It has been observed from various studies that decision making regarding residential location choice is integrally associated with

two other types of decision making. They are a) choice of ownership (i.e. owned or rented accommodation) and b) consumption of land (plotted development or condominium/apartment/flat). The study also investigates the preferred combination of spaces and their characteristics desired within their dwelling units based on the psycho-social considerations.

Choices are often expected to be made simultaneously for various types of decision, rather than carried out in a sequential manner (Lerman, 1976 & Rapaport, 1997). An extensive list of variables has been identified for this study which are expected to influence the decision making process for residential location, ownership pattern and type for housing (i.e. plotted development or multi-storied apartments). These variables have been broadly classified under five categories and presented in Table 1. Two categories of income i.e. LMIG (Lower MIG with income range from 10,000 INR to 30,000 INR) and HMIG (Higher MIG with income range from 30,000 INR to 50,000 INR) have been used for this study. Residential location also has been divided into three broad categories i.e. near CBD, near sub-city business center and near district center. Type of housing was limited to two choices i.e. plotted type and apartment type.

| | |
|---|---|
| Demographic characteristics of households | Family type (FT) |
| | Household size (HHS) |
| | No. of Children (NC) |
| | Mother tongue (MT) |
| | Age of household head (AHH) |
| | Education level of household head (EHH) |
| Socio-economic characteristics of households | No. of workers in household (NWHH) |
| | Occupation of household head (OHH) |
| | Monthly disposable household income (MDHI) |
| Economic attributes of housing stock | Type of dwelling unit (TDU) |
| | Dwelling ownership (DWO) |
| | Monthly rent (RENT) |
| | Net present value of housing stock (NPVH) in |
| Quality/Structural attributes of housing stock | No. of habitable rooms (HR) |
| | No. of bedrooms (NB) |
| | Age of dwelling unit (ADU) |
| | Duration of stay for the present household (DS) |
| Social attributes of Neighborhood | Location of Neighborhood (LN) |
| | Access road width to neighborhood (AN) |
| | Level of overcrowding/congestion (PC) |
| | Type of Neighborhood (TN) |
| | Proximity to park facilities (PPF) |
| | Proximity to school facilities (PSF) |
| Accessibility attributes | Place of work (PW) |
| | Mode of travel to work place (MTW) |
| | Mode of travel to shopping (MTS) |
| | Proximity to relatives (PFF) |

Table 1: Broad classification of variables chosen for study of residential location, ownership and type

An extensive data set at household level was collected through a stratified random sample survey in the city of Nagpur. This data set was used to identify the variables which are significant and calibrate the model. Based on the level of significance of each variable, elimination was carried out. Only the significant variables were entered into discrete choice model for calibration. As previously discussed multinomial models are chosen for discrete choice analysis. Both step-by-step and simultaneous decision making models were tested.

To get a feedback on residents' satisfaction in public housing it was necessary to go to the actual users and find out their preferences, their ranking of the priorities, their response and perception on various factors present (or absent) in their houses. After conducting pilot surveys in various parts of India, the final questionnaire survey was done in the city of Kolkata. The structure of the questionnaire had four sections related to:
Factual data
Perceptual data
Future expectations
Personal data

The questionnaire had the objective of finding out the housing satisfaction of the residents at three physical levels: i) Dwelling unit level ii) Cluster level and iii) Neighborhood level.

**4. Study results and inferences**

Residential location, types of ownership and dwelling types, have been taken as dependent variables. Table 2 presents the list of variables according to the broad groups found significant for this study for both LMIG and HMIG households.

| Location of neighborhood | | Dwelling type | | Dwelling ownership | |
|---|---|---|---|---|---|
| *(LMIG)* | *(HMIG)* | *(LMIG)* | *(HMIG)* | *(LMIG)* | *(HMIG)* |
| No. of habitable rooms | Monthly rent | HH size | Family Type | Mother tongue | HH size |
| No. of bedrooms | Access road width to neighborhood | Mother tongue | Monthly rent | Monthly rent | Number of children |
| Level of overcrowding /congestion | Type of neighborhood | Education level of household head | Dwelling ownership | Net present value of housing stock | Occupation of household head |
| Type of neighborhood | Proximity to park facilities | Monthly rent | Duration of stay for the present household | Access road width to neighborhood | No. of bedrooms |
| Place of work | Mode of travel to shopping | Net present value of housing stock | Proximity to school facilities | Proximity to relatives | Level of overcrowding/congestion |
| Proximity to relatives | | Duration of stay for the present household | Place of work | | Type of neighborhood |
| | | Place of work | | | Proximity to park facilities |
| | | Mode of travel to work place | | | Proximity to school facilities |

Table 2: List of significant variables for LMIG and HMIG for choice of residential location, type and ownership

Multinomial model had been used to explore the strength of variables found significant in deciding the location, type and ownership. Stepwise elimination process had been used using SPSS V 13.0 software to get the results separately for LMIG and HMIG households.

A brief look at the results indicates that age of household head as well as number of habitable rooms and bedrooms are the most significant factors influencing location decisions of LMIG households. On the contrary, location decisions for HMIG households are more explained by variables i.e. proximity to park facilities, type of neighborhood and age group of the household head. Net present value of the housing stock is the key element towards deciding the type as well as ownership of housing stock for LMIG households. The decisions in HMIG households for type as well as ownership is influenced by number of habitable rooms/bedrooms, duration of stay, proximity of park/school facilities, type of neighborhood etc. It must be observed that the estimation error for unconditional (i.e. sequential decision making) is much higher than conditional (i.e. simultaneous decision making) – making the latter a much preferred model for estimation of housing location/type/ownership choice probabilities.

The estimated probabilities from sequential decision making model and simultaneous decision making model for LMIG households reveal that the decisions taken for location are very similar in both the approaches. However, there is wide disparity when it comes to choice of dwelling type and ownership. For HMIG households the decisions regarding location also vary considerably along with outcome for dwelling type and ownership. It can be concluded that location decisions for LMIG households can be still carried out independently without taking preference for dwelling type and ownership into account as compared to HMIG households. Unconditional decision making for dwelling type and ownership (i.e. without taking location/type/ownership into account) will result in spurious outcomes.

Regarding preferred combination of spaces within dwelling units, the study revealed that, 82% of the respondents preferred a living cum dining room arrangement, whereas only 8% liked the kitchen-dining combined. About 84% preferred a combined kitchen-store. 83% preferred a bath cum toilet instead of separate bath and toilets. 70% preferred to have the bath cum toilet attached to their bedrooms for better privacy especially when guests were present.

Considering the hot-humid climatic conditions, a balcony was the automatic choice. About 80% of the respondents expressed the desire to have additionally a separate small balcony for drying of clothes. The respondents largely resented a kitchen near the entrance. About 51% of them wanted a separate servant's room.

It may be added here that, a vast majority of condominiums and group housing projects that are now coming up are providing servant's room at the entrance lobby. This, it is often argued, is leading to social and privacy problems. It has to be further studied to find the best location for such servant's rooms, whether within the owner's apartment, or in a stand-alone cluster.

Analysis of psycho-social consideration reveals that 56% of the respondents preferred the public authorities to provide alternative plans to choose from. They were averse to the process of blind allocation of apartments and preferred an opportunity to choose their neighbors. Nearly 84% of them stated that they preferred to socialize 2-3 times a week with their neighbors. This implied the necessity of various forms of community spaces for different age groups.

Other aspects on which response of the respondents were recorded included:
Perceived comfort problems
Preferred distance of facilities
Things liked most in housing area and
Things disliked most in housing area

The respondents were also asked to participate in a star rating exercise. They were asked to give scores out of 10 to a given set of parameters within different areas of their dwelling units, and to another set of parameters put at the unit level, cluster level and the neighborhood level. The marks were converted into stars. 5 stars indicated maximum importance, while 1 star indicated the lowest importance.
The ratings indicated the respondents' desires, priorities and preferences for housing, at the unit, cluster and neighborhood levels. Some of the major findings from the ratings within the dwelling units are represented as:

- The parameters that received maximum importance in bedrooms were ventilation, privacy and climate balancing. For the living room the most important parameters were size and identity. Circulation was the most important parameter for dining rooms. Proper finish, exhaust and storage were important parameters for kitchens. Finish and privacy were most important parameters for toilets, while morning sun and breeze were the most preferred parameters in balconies.
- The major findings from the ratings of the parameters at the unit level, cluster level and neighborhood level were: At the unit level, the maximum importance was given to identity, privacy, flexibility, light and ventilation, finish and storage. At the cluster level, the maximum importance was given to children's play area, security and socializing. At the neighborhood level, the parameters that received high preference were security, children's play area, circulation, less pollution and open areas.

Multivariate analyses were also done to assess the relative importance of various factors in predicting satisfaction. Firstly, this had been done through an estimate of the association between the various responses as expressed by the respondents using ecological regression, and later through correspondence analyses of the various responses. This helped to assess the correlation between various attributes. A strong correlation for instance, was observed between the factors proximity to daily market and socializing.

By analyzing the bi-plot obtained through correspondence analysis, an assessment was done to find out how the combination of various attributes and different spaces considered simultaneously, affected residents' satisfaction. It indicated for instance, greater correspondence between the attribute flexibility with living area, natural light and identity with bedroom, morning sun and breeze with verandah. The bi-plot (scatter plot) also indicated correspondence between various areas within the dwelling unit. Thus, bedroom, living area and verandah were clubbed closer, kitchen and toilet were clubbed closer and store and dining were clubbed closer. Also, the bed area for instance, showed greater correspondence with living area than with dining area and store area had greater correspondence with kitchen than with veranda.

Correspondence analysis was also done for the star ratings of different attributes at the unit, cluster and neighborhood levels. This helped to assess the relative importance of a combination of factors (attributes) in predicting residents' satisfaction at the different levels in a housing area. At the unit level attributes like privacy, flexibility, ventilation and light, rendered greater satisfaction to the residents. At the cluster level, attributes like well-designed children's play area and proper drainage system could lead to greater residents' satisfaction. Similarly at the neighborhood level, attributes like pollution free environment, open areas and proper amenities and facilities lead to greater residents' satisfaction. Attributes like security, parking and garbage cleaning had similar correspondence within the cluster and neighborhood levels.

## 5. Conclusion

The study has tried to find the sensitivity of various parameters on residential location, type and ownership preferences of the housing demand. These findings can have immense bearing on the policy and regulatory framework for future residential development anticipated in the city. It will provide inputs for locating various types of residential developments according to target user group. It

will also provide design inputs which can immensely increase the residential satisfaction level – increasing the Quality of Life of its users.

**References:**

Lerman, S.R. (1976) "Location, housing, automobile ownership, and mode to work: a joint choice model", Transportation Research Record 610, pp. 5–11.

Rapaport, C. (1997) "Housing demand and community choices", Journal of Urban Economics 42, pp. 243–260.

Francescato, G. (1998) "Residential Satisfaction", in Vliet, W. V. Ed. The Encyclopedia of Housing, Sage Publications, London, New Delhi.

Morris, E. W.; Winter, M. (1978) – "Housing Family and Society", John Wiley and Sons, New York.