DETERMINATION OF VALUE INDICATORS FOR A REAL ESTATE PROPERTY

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ABSTRACT

This study intends to find out the critical factors affecting value with a questionnaire survey meant for the general public throughout the globe and results of the said survey will be utilized for framing conclusions of planned objectives. Questions were framed after thorough study of similar research papers and after consulting with valuation professionals having in-depth experience of various problems and hurdles faced in such scenarios. This was done by personal interviews and internet based survey. The value indicators contribute in determining the economic value of a real estate property. According to the data analysis it was discovered that, basic necessities like electric and water supply topped the list of prominent attributes of property value, followed by the surrounding locality, good ventilation and personal parking facility among others. Appropriate valuation method can thus be used further to determine the property values using the results of this questionnaire survey.

Keywords: *value, value indicators, real estate property, valuation, weighted mean*

1. INTRODUCTION

Property valuation is a complex and time-consuming process which is carried out by qualified real estate appraisers. Number of properties and number of purchase-sale transactions grows year by year. Mass real estate appraisal appears as another big problem. These issues are connected with deficiency of human and time resources. Therefore, numerous studies are carried out on computer systems which can support the real estate appraisers. Automated property valuation systems are also developed (Malinowski et. al., 2018). There has been an increasing demand for maximizing the environmental, social, and economic value of built infrastructure. However, a major gap still exists in the area of value analysis; there is no formal model to conceptualize, represent, and reason about value and valuation of built infrastructure (Lu Zhang and Nora M. El-Gohary, 2016).

Real estate markets are ideal investment options that lead to the construction industry's and the economy's growth. Therefore, having appropriate investment and valuation strategies is a critical success factor. Most established valuation methods emphasize market value and economic factors and are ignorant about buildings' technical and structural attributes. Therefore, due to the process ambiguity and lack of information access, the estimated price usually differs from the real property value (Ania Khodabakhshian and Hossein Toosi, 2021).

Sayali Sandbhor and N. B. Chaphalkar focused on utilizing past data to predict future property values. The utilization of over 3000 past valuation reports from 2006 to 2016 in Pune city, Maharashtra, India, reflects the comprehensive nature of their research. By identifying 19 key attributes influencing property value through a combination of literature review and expert validation, they laid a strong foundation for their study. The subsequent employment of Principal Component Analysis (PCA) as a means to reduce the dataset is a common technique in multivariate analysis. Furthermore, their use of the Statistical Package for Social Sciences (SPSS) version 21.0 to condense the initial 19 attributes to 7 indicates a desire to streamline the analysis and emphasize the most significant factors influencing property values. This reduction of attributes can aid in the construction of a more efficient and focused predictive model.

Yu Zhang et. al. introduced a more comprehensive framework to understand and analyze housing prices, incorporating various factors such as built environment variables, neighbourhood socioeconomic characteristics and individual dwelling conditions. The study utilizes a Geographically Weighted Regression (GWR) model and a Random Forest (RF) model to enhance the diagnostic, explanatory and simulation capabilities of the model. This approach aligns with the growing trend in the field of housing price analysis, which emphasizes the need for a more comprehensive and nuanced understanding of the various factors influencing housing prices. By incorporating a systematic framework and utilizing advanced modeling techniques such as GWR and RF, the study likely aims to provide a more accurate and detailed analysis of the determinants of housing prices, thereby contributing to a more robust understanding of the housing market dynamics.

Huanhuan Luo et. al. concentrated on the interplay between structural attributes, accessibility of neighboring destinations and their impact on housing prices in the core urban area of Dalian city, China. Given the global importance of housing prices in urban studies, the authors emphasize the crucial role of transportation accessibility as a key determinant influencing housing purchase decisions. Using a substantial dataset comprising sales prices of 51395 commercial apartments and houses alongside corresponding geographic coordinates of residential areas, the study employs a hedonic price model to estimate the effects of various factors on housing prices. The research findings highlight the significant influence of both structural attributes and accessibility to neighbouring destinations on housing prices. Notably, the location of the property emerges as a primary factor shaping housing prices, along with the quality of nearby higher education resources and proximity to public transit services.

Sukran Yalpir et al. emphasized the need for a comprehensive mass real estate valuation system that takes into account various factors such as the specific characteristics of different real estate types and the unique features of the region under consideration. The researchers conducted a survey involving

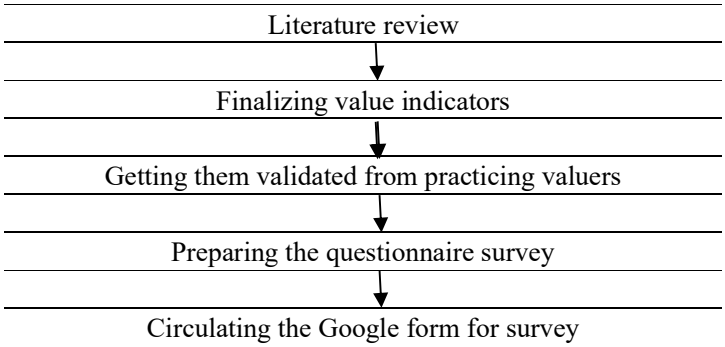
both experts and citizens to identify the key features that significantly influence the valuation of real estate properties. The study employed various analytical techniques such as Frequency Analysis (FRA), Principal Component Analysis (PCA), Factor Analysis (FA) and Analytical Hierarchy Process (AHP) to determine these crucial features. Subsequently, 21 scenarios were created based on the survey results, and the Multiple Regression (linear) Analysis (MRA) method was utilized to verify the significance of these features under market conditions.

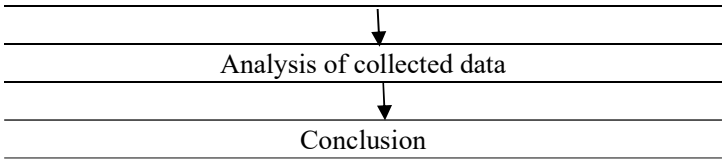
Traditional methods of real estate property valuation are not sufficient in providing the most accurate value of any property. Also, the practicing valuers provide a value that is generated from their personal judgement based on real estate consultant's survey, neighbours interview, ready reckoner booklet or previous sales transactions in the close vicinity. The hedonic pricing method is indeed a widely used approach to estimate the economic value of various attributes, including ecosystem services, external factors, or other characteristics that may influence the market price of a good or asset, such as real estate. It is a valuable tool to understand how different factors contribute to the overall value of a product and it is particularly common in the valuation of real estate properties, like houses. Environment friendly neighbourhood, open spaces, gardens, jogging tracks, nearby satellite towns, historical monuments, hills may affect by increasing the concerned property's value whereas, concreted open areas, mobile towers in close vicinity, electricity cables nearby, municipal rules may affect the property value in an adverse manner.

Now-a-days, even the government offices are providing the location wise rates on their website which are readily available for ready reference. It so appears that the stated value of any property is for the reference purpose only and does not justify the worth of that concerned property. For example, a loan seeker or his approached bank may be provided with a valuation report that quotes any value appropriate enough to grant him the required amount of loan and not the then fair market value of his property. Two distinct properties in the same vicinity cannot have the exact same features and hence, the same value which is derived referring the standard booklet. The rate per unit mentioned in the booklet may be same for the entire locality but, depending on the floor on which a particular property under consideration is situated or its orientation may not be the same. Therefore, their value may differ. As a guide, the booklet or any website may provide references, but calculating the most suitable value of a property requires its detailed study and proper, technically sound approach of calculating the value.

2. METHODOLOGY

To determine the value indicators of a real estate property, a questionnaire survey regarding the factors affecting value was done to shortlist the most prominent indicators of value. These questions were validated from the practicing valuers. A Google form link was shared with around 1000 individuals. Data analysis was done using the received responses in the raw manner. An appropriate valuation method can then be used to determine the value of property based on the results of this questionnaire survey. The adopted research methodology is shown below -





The responses were analyzed using the data collected by applying the mean score technique. Five point scales were used to calculate the mean score for each response factor or option. The mean scores were then used to rank options in descending order or importance. The mean score for each factor or option was calculated by using the following formula (Siegel and Castellan 2008):

$$\textbf{Mean Score} = \frac{\sum \boldsymbol{S\,x\,f}}{\boldsymbol{N}}$$

where, s = score given to each factor by respondents, ranking from 1 to 5.
f = frequency of each rating for each factor or option.
N = Total number of responses for that factor or option.

The mean score is a weighted average for the responses received for each question. For all questions that the mean score technique was applied, there was a rating scale represented by values from 1 to 5, 1 being very low and 5 being very high. The mean scores were calculated by first multiplying the number of respondents by the weight of the response option to determine the weighted value. The total numbers of respondents were then calculated for all rating options. The calculated weighted value was then divided by the sum of all respondents. The resulting value had to fall between 1 and 5. Considerable decimal values were used to show the mean score of all factors and these factors were ranked in a descending order according to their mean scores. The central tendency was assessed by observing the distribution of responses to identify the most frequent response or central point. The variability of responses was considered by assessing the range or spread of responses to understand the diversity of opinions.

3. RESULTS AND DISCUSSION

According to the planned objectives, a questionnaire survey was prepared in the Google form with general information of the respondents and 34 probable factors affecting value. Respondents were asked to rate these attributes on a likert scale of 1 to 5 as per their perception. Google form link was shared on email and social media service with 1000 prospective individuals out of which, only 343 replied. The Google form link was kept active for a month and then the downloaded responses were analyzed. The questionnaire survey responses are considered as person specific.

The initial set of questions focused on the general information of the respondents. The first parameter was the age of respondents in which the youngest was 18 years and the oldest was 75 years old.

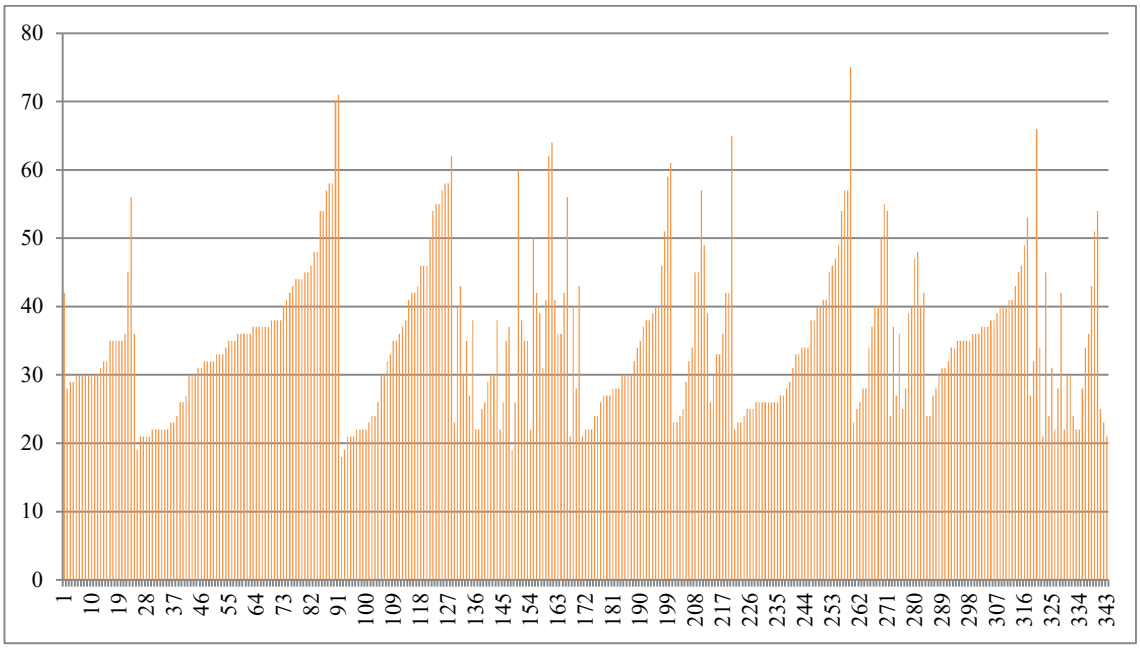


Figure 1 – Age of respondents

The next question was regarding the city of respondents. It was noted that majority of the respondents were from the Aurangabad city besides which the major portion of respondents belonged to Mumbai and Navi Mumbai.

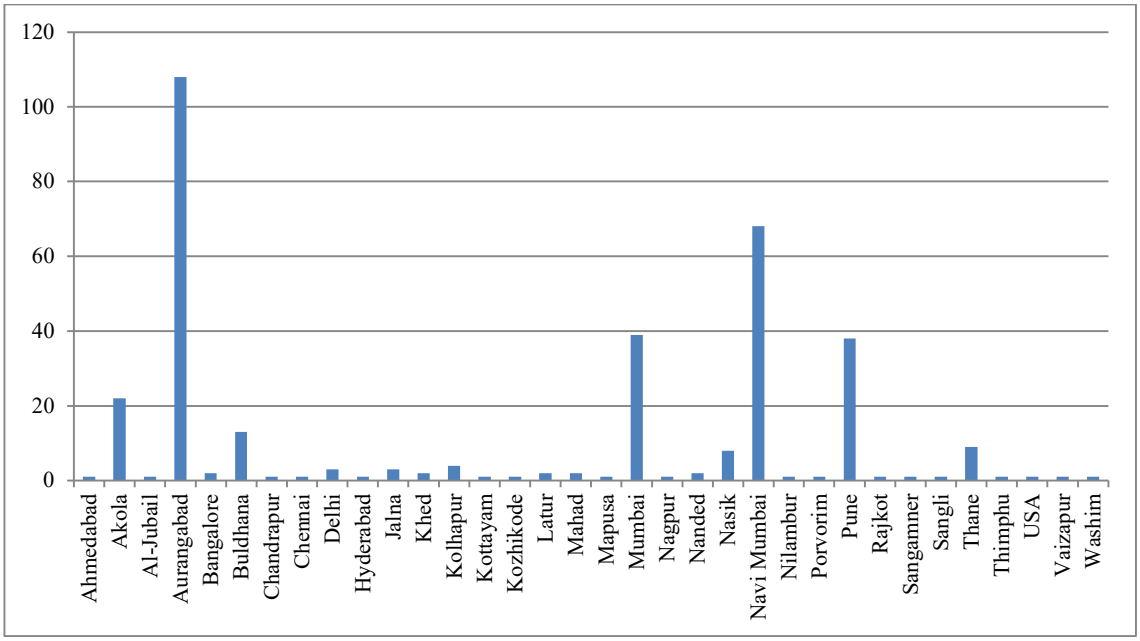


Figure 2 – City of respondents

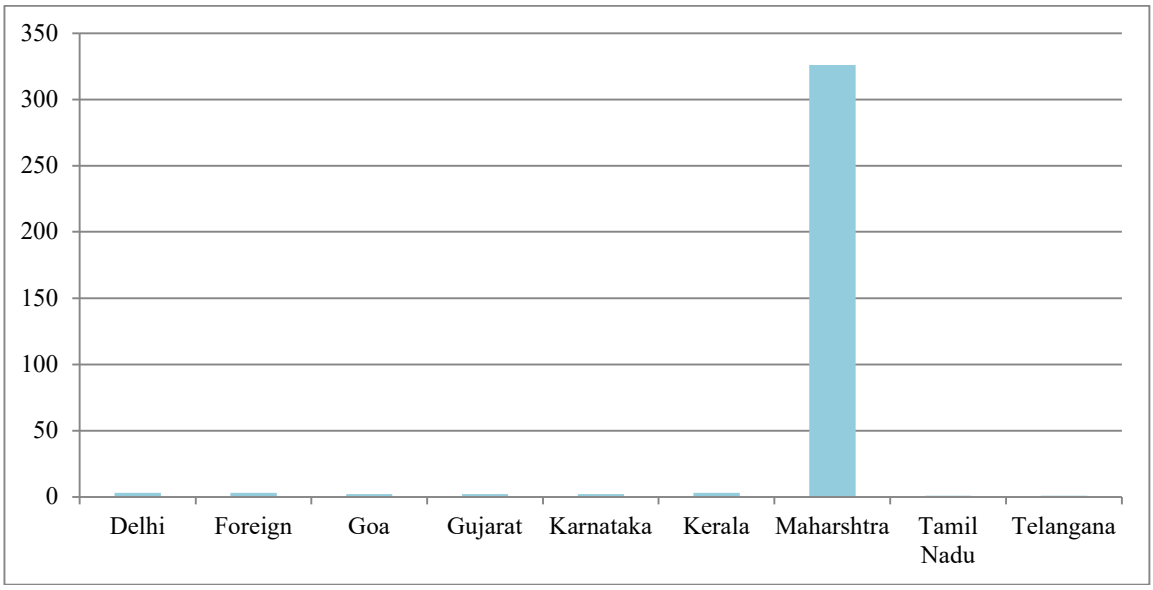


Figure 3 – State of respondents

Regarding the qualification of respondents, maximum were from the civil engineering background.

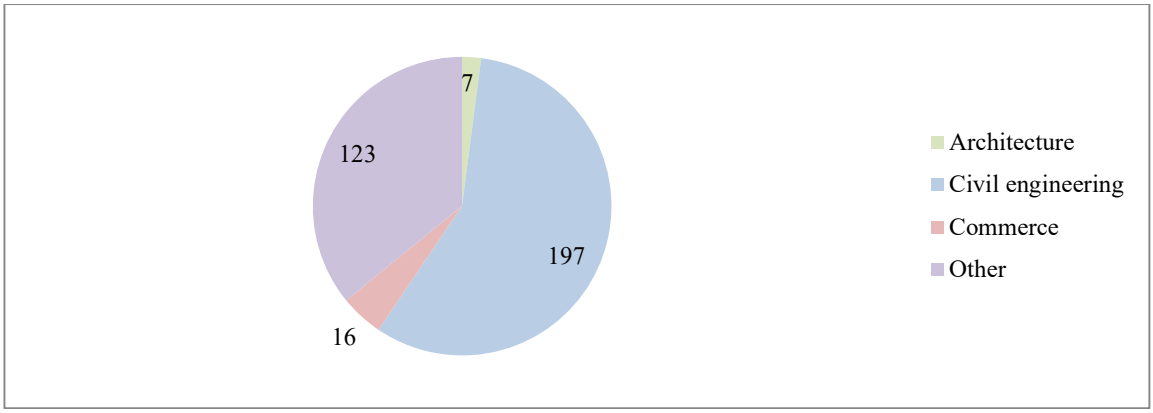


Figure 4 – Qualification of respondents

They were also asked whether they are working as valuers or not, to which they replied and it was noted that only 34 out of 343 are practicing valuers.

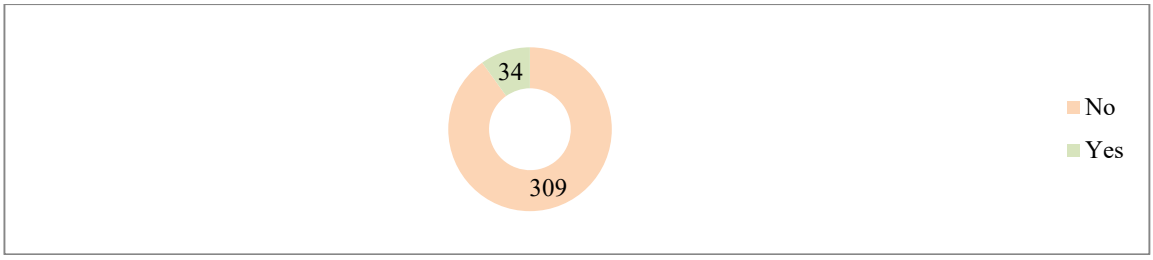


Figure 5 – Valuer or not

The designation of respondents was also enquired and they are listed below -

Table 1 – Designation of respondents and their count

Designation of respondents			
Accountant	7	Manager	42
Advocate	3	Medical representative	3
Architect	4	Principal	12
Billing engineer	2	Professor	104
Contractor	7	Project site engineer	111
Doctor	2	Real estate valuer	34
Goldsmith	1	Tax consultant	4
Interior designer	1	Town planner	6

Experience of the respondents was also enquired and it was seen that the respondent with maximum experience was 40 years.

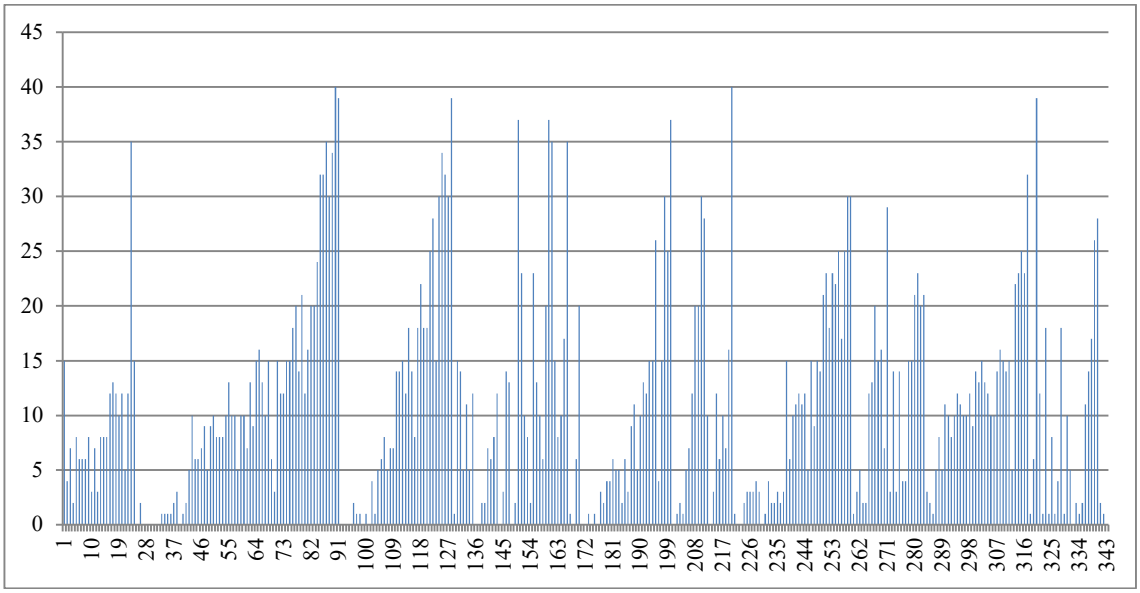


Figure 6 – Experience of respondents

It is also worth noting that the majority of respondents fall under the income group of Rupees 5 lakhs to 10 lakhs.

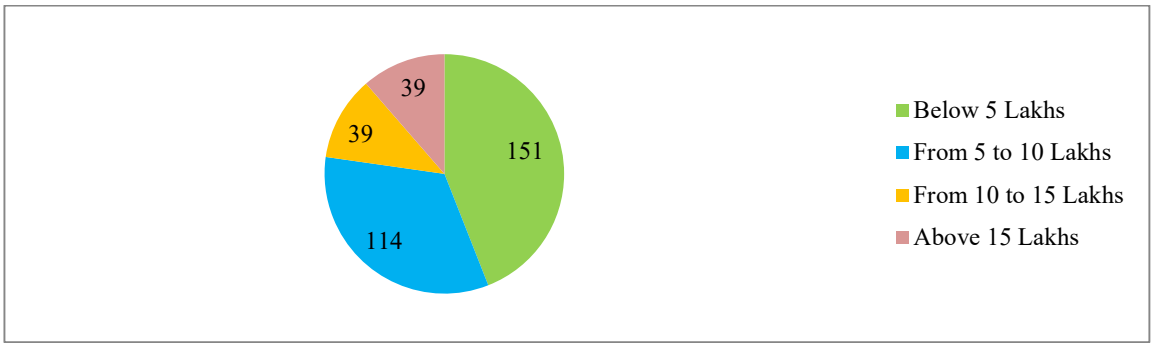


Figure 7 – Income group of respondents

Following graph shows the number of respondents who quoted a particular rating between 1 to 5 for all of the 34 questions.

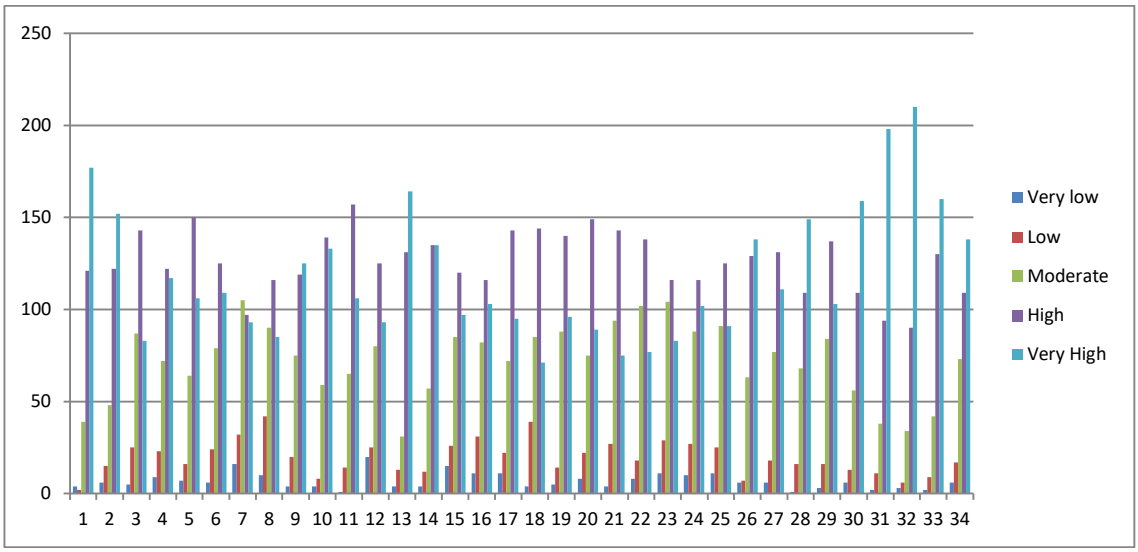


Figure 8 – Responses to all 34 questions

Based on the analysis work, the attributes of value were ranked according to their weighted mean in the descending order. The most frequent response was also calculated for each question along with the range. It showed that the responses had relatively high variability with the range of 4 for each question. The relatively high variability among the respondents suggests moderate agreement for each of the value attributes. The questionnaire was framed by categorizing the questions as per the concern of building details, location details and service facilities. Following table shows the questions as per their category and rank with respect to the weighted mean.

Table 2 – Rank wise list of value attributes

Question	Most Frequent Response	Mean	Rank	Category	SD
Continuous electric supply	5	4.4519	**1**	Service facility	0.8098
Regular water supply	5	4.3848	**2**	Service facility	0.8489
Locality around	5	4.3557	**3**	Location details	0.7947
Good ventilation	5	4.2770	**4**	Building details	0.8651
Personal parking facility	5	4.2741	**5**	Service facility	0.8193
Availability of lift	5	4.1720	**6**	Service facility	0.9520
Near transport	5	4.1633	**7**	Location details	0.9428
Construction quality	4	4.1341	**8**	Building details	0.8603
Legal control of property	5	4.1341	**9**	Building details	0.9097
Returns from property	5	4.1254	**10**	Building details	0.8996
External view	5	4.1224	**11**	Building details	0.8886
Security services	5	4.0379	**12**	Service facility	0.9846
Age of building	4	4.0292	**13**	Building details	0.8290
Size of property	5	3.9942	**14**	Building details	0.9598
Public transport	4	3.9679	**15**	Location details	0.9300
Free access to property	4	3.9417	**16**	Building details	0.9550
Particular floor	4	3.9359	**17**	Building details	0.8980
Near market	4	3.9184	**18**	Location details	1.0241

Question	Most Frequent Response	Mean	Rank	Category	SD
Total rooms	4	3.8980	**19**	Building details	0.9058
Road conditions	4	3.8950	**20**	Location details	0.9871
Future expansion	4	3.8426	**21**	Building details	1.0036
Total bedrooms	4	3.8426	**22**	Building details	0.9591
Near workplace	4	3.7988	**23**	Location details	0.9370
Insurance of property	4	3.7959	**24**	Building details	1.0438
Solar panels	4	3.7843	**25**	Building details	1.0691
Depreciation	4	3.7580	**26**	Building details	1.0258
Rain water harvesting	4	3.7522	**27**	Building details	1.0798
Total bathrooms	4	3.7522	**28**	Building details	0.9226
Maintenance charges	4	3.7522	**29**	Building details	0.9382
Vastu shastra	4	3.7172	**30**	Building details	1.1139
Total floors	4	3.6968	**31**	Building details	0.9605
Taxes	4	3.6735	**32**	Building details	1.0322
Groundwater	4	3.6531	**33**	Location details	1.0687
Pollution in area	3	3.6385	**34**	Location details	1.1134

The graphs for the category wise questions is shown below for all the three categories – building details, location details and service facilities.

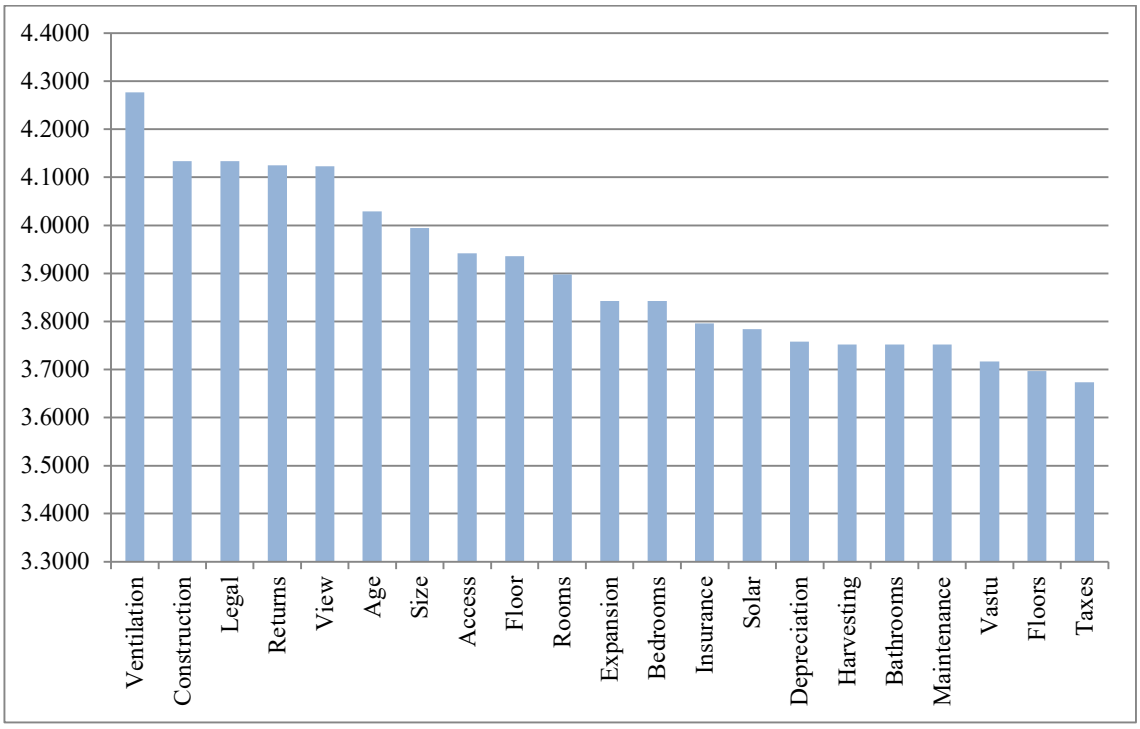


Figure 9 – Building details parameters

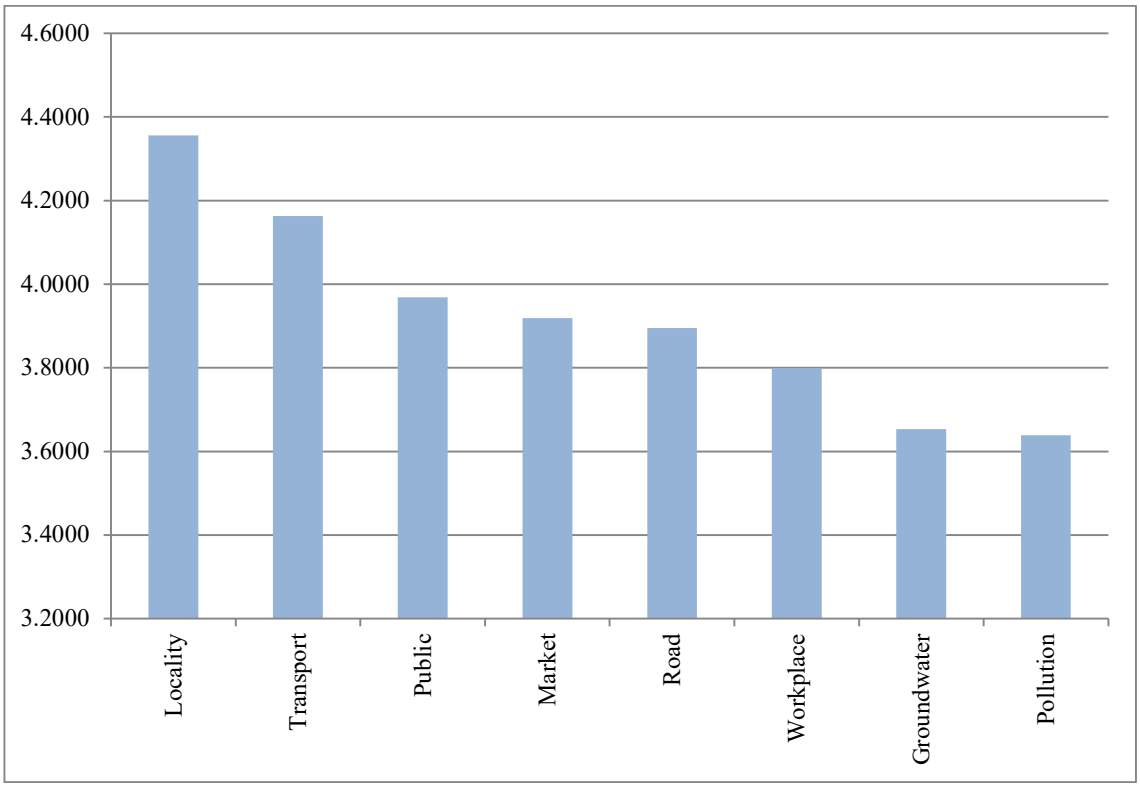


Figure 10 – Location details parameters

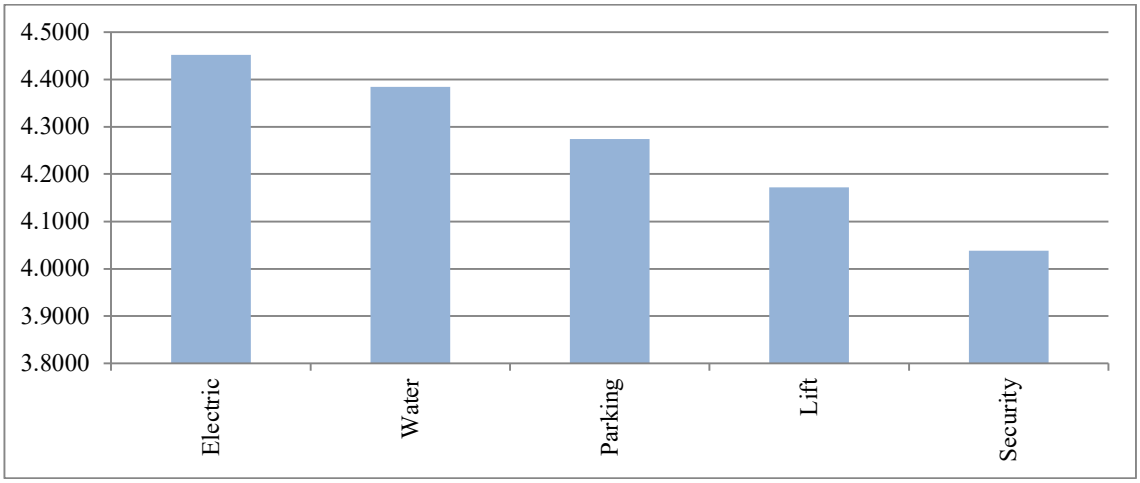


Figure 11 – Service facility parameters

4. CONCLUSIONS

The respondent's perception about the critical attributes of a property value was collected using a questionnaire survey. It was observed that the prominent factors affecting value were the ones with highest range of weighted mean including continuous electric supply (4.4519), water supply (4.3848), surrounding locality (4.3557), good ventilation (4.2770), personal parking facility (4.2741), availability

of lift (4.1720), proximity to public transport (4.1633), construction quality (4.1341), legal control (4.1341) and returns from the property (4.1254). Among them, four each belonged to service facility category – continuous electric supply, water supply, personal parking facility, availability of lift and building details category – good ventilation, construction quality, legal control, returns from the property whereas, two belonged to the location details category – surrounding locality, proximity to public transport. Out of these, the central point was very high i.e. 5 for all the factors except construction quality which had the central point as high i.e. 4. The central tendency therefore signifies that, majority of the respondents preferred these parameters with highest level of agreement i.e. 5. The other parameters with highest level of agreement were external view (4.1224), security services (4.0379) and size of property (3.9942). Only pollution in area (3.6385) was identified as the neutral or moderate parameter with a central point of 3 whereas, all the remaining parameters had the central point as high i.e. 4. So, it can be concluded that the above mentioned 10 factors affecting value from weighted mean of 4.4519 to 4.1254 (in descending order of mean), with ranks of 1 to 10 can be used to value a real estate property with an appropriate method of valuation.

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