

Assessing Housing Project End-Users Satisfaction in Ghana: A Case Study of SSNIT Housing Flats in Asuoyeboa-Kumasi

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Abstract

Provision of housing is a critical component of the social and economic structure constituting basic human needs. Housing challenges however ranges from inadequate provision to unsatisfactorily performance regarding project location, housing features and demographic characteristics. This paper identified and assessed factors constituting end-users perception of satisfaction against the performance of the housing development. Thirty-five (35) factors were identified as constituting perception of end-users satisfaction and grouped under building design, neighborhood conditions, social amenities and management practices. A case study approach and purposive sampling of the two types of designs were used. Questionnaires were administered to occupants of thirty-eight (38) flats to rank the factors using five-point Likert scale and Relative Importance Index, the factors were analysed. End-users were generally satisfied with building design features especially room height and material finishes. Respondents were dissatisfied with housing designs without balconies, terraces, and outdoor spaces for traditional food preparation and socio-cultural practices. In addition were location, high dust and noise levels, inadequate social infrastructure and poor management practices. The study recommends gated community concept, consideration of noise and dust buffers, spaces for social-cultural practices and location away from major highway for enhanced end-users satisfaction.

Keywords: Assessing, End-User, Ghana, Housing Projects, Satisfaction.

1. Introduction

According to Maslow (1954), housing is a necessity for man's existence and considered a vital human and social need (Isa *et al.*, 2012; Olotuah, 2005). It is crucial for socio-economic stability and impacts the life of individuals and the nation; a great importance is therefore ascribed to the role it plays in creating human comfort by both nature and society (Jiboye, 2010, Bank of Ghana Report, 2010). The challenges of housing have been pronounced in undeveloped and developing countries where basic need of shelter is unaffordable (Harrisa and Arkub, 2007). According to a United Nations Report, three billion persons will be living in slums by 2050 (UN Habitat Report, 2007).

Rapid urbanization constitutes a vital factor that triggers lack and poor housing in urban centres. Isa and Mohd, (2012), quotes Abdullahi *et al.* (2012) as opining that the problem of housing in developing countries is basically from the high growth of urbanization resulting in government's inability to provide affordable housing for citizens importantly, the low-income group. It has been established many public and private housing projects failure in most developing countries stems from non-inclusion of relevant inputs from the end-users of residential developments (Adesoji, 2012).

The designs of many new residential developments have been patterned along developers and designers' ideas and perceptions to meet future needs, aesthetic appearance and developer's goals rather than its suitability towards ensuring occupants or end-users satisfaction (Jiboye, 2011). Since every facility is aimed at meeting set design aspirations, completed residential buildings should be fit for users' purpose and functions so as to ensure relative residents' satisfaction (Liu, 1999).

Houses in Ghana are mainly developed by house owners or small scale contractors in the informal sector. Housing estates are however developed mainly by Real Estate Developers and Government Institutions such as the Social Security and National Insurance Trust, SSNIT and State Housing Corporation to meet increased housing demand due to urbanisation coupled with inadequate housing provision for workers of many organizations. SSNIT began housing development in 1975 commissioning the construction of 554 housing units comprising three, two and one bedroom self-contained units for rental or outright purchase. However, simply providing a person with housing units does not measure the success of housing programmes. Ukoha and Beamish (1997), report on the suitability of the living environment to "meeting the needs of the end-users" which is essential in assessing the success of a housing scheme. In the social housing sector, judging developer's performance by measuring residents' satisfaction is critically important (Adesoji, 2012).

Satisfaction is an experience of fulfillment of an expected outcome influenced by prior expectations regarding the level of quality (Ekinci, 2004). If what is communicated to the end-user, does not match the expectation or experience, a negative perception of quality and satisfaction is generated. End-user satisfaction is considered to affect user retention and, therefore, profitability and competitiveness (Anderson and Sullivan 1993). The significance of end-user satisfaction is emphasized in markets where competition is intense (Kotler,

2000).

2. Problem Statement

Adequate housing provides the foundation for stable communities and social inclusion. This rather is not the case in Ghana where there is huge housing deposit. The Ghana Statistical Services confirmed in their 2011 publication, a huge housing deficit in Ghana (Ghana Statistical Services Report, 2011) yet there are several abandoned housing schemes. Housing in Ghana is the most deficient with poor housing delivery as a national headache (ghanaweb.com). In addition, housing problems are seen as both qualitative and quantitative (kma.com). This together suggests the need to review housing development in Ghana.

Housing project is capital demanding and it is disheartening to record non-occupancy and low occupancy rates as in Malaysia resulting from non-participation of end-users in housing development (Isa and Mohd, 2012). Housing project failures have been attributed to the non-inclusion of end-users (Adesoji, 2012).

There is the need for improved housing delivery which can be achieved only through feedbacks from the end-users as customers of housing development (Abdul et al, 2010), justifying the need for this research for improved housing delivery.

There is lack of studies on housing end-users satisfaction (Ahadzie and Badu, 2011). This has resulted in the absence of design improvement, innovation schemes for housing projects (Ilesanmi, 2010). A study that considers end-users perception which will serve as a feedback for housing development improvement is long over-due.

Research Objectives

The main aim of the study was to identify and assess the levels of what constitute end-users satisfaction with regards to housing delivery in Ghana. The following research objectives evolved:

1. To identify major areas (factors) impacting on end-user satisfaction.
2. To explore the variables which constitute end users perception of satisfaction
3. To assess the levels of end-users satisfaction in relation to the facilities and services provided in SSNIT flats at Asuoeyeboa in Kumasi, Ghana.

3. Literature Review

Housing means more than shelter and does not measure the success of any housing projects (Ukoha and Beamish, 1997; Cited in Adesoji 2012). Housing satisfaction however refers to the end-users' degree of contentment with the current housing situation (Djebarni and Al-Abed, 2000). As population increases, demand for housing also naturally increases. According to the World Bank's Report (2003), 12 to 15 million households requiring an equivalent number of dwellings are added to the cities of developing countries yearly including Ghana due to rapid urbanisation, high population growth, low level of housing delivery has led to high demand and housing crisis (Tipple 1994; Songsore 2003). In 2003, the then Home Finance Company Limited projected new annual demand of 133,000 housing units in Ghana. In view of the high demand, the State Housing Corporation, SHC and Tema Development Corporation, TDC were established to facilitate residential units' delivery in the rapidly growing cities in Ghana (*Statesman*, 2007).

The Social Security and National Insurance Trust, SSNIT was established in 1972 under NRCD 127 to administer the National Social Security Scheme as the only trustee of the scheme in Ghana (PNDC Law 247). In 1980, SSNIT established to manage workers' pension funds, expanded its existing program to include housing for its staff and commenced housing development aimed at providing lower rental option for the general public. In 1988, SSNIT has developed over 10,000 prototype housing schemes in thirteen communities in Ghana including the Asuoeyeboa flats to augment Government of Ghana's (GOG) policy direction change as the direct provider (Ahadzie and Amoa-Mensah, 2010). SSNIT is the largest single entity involved in formal developer-driven housing in the country with the largest housing stock of formal rental units and has also partnered the Ghana Real Estate Developers Association, GREDA. In 1980s, SSNIT constructed 554 housing units in Kumasi comprising of self-contained flats without end-user satisfaction assessment as a feedback.

Satisfaction is a process of evaluation between what is received and expected (Parker & Mathews, 2001). Housing satisfaction is defined by Galster (1987), cited in Varady&Preiser, (1998) as the "perceived gap between a respondent's needs, aspiration and the reality of the current end-users context". Ogu (2002) refers to the concept of housing satisfaction as often employed to evaluate end-users perceptions and feelings for their housing units and the environment. There is the need for evaluation of what end-users receive, reality as against expectation. The degrees of contentment or feelings are determined by factors such as, overall physical and social components (Francescato, et al., 1987), Further, age (Varady&Preiser, 1998; Varady et al., 2001), marital status (Tan &Hamzah, 1979), family size (cited in Theodori, 2001), socio-economic status of income, education, employment and welfare (Freeman, 1998; cited in Varady et al., 2001), length of residency (Brown, 1993; cited in Theodori, 2001;), housing physical characteristics (Yeh, 1972), physical condition and management services (Varady & Carrozza, 2000), social participation and interaction (Varady & Preiser, 1998), past and future living

conditions (Morshidi, et al., 1999; Yeh, 1972).

Awotona (1991), states that, satisfaction is influenced by the customers' expectations of the product performance, dwelling unit characteristics, management, environmental and location factors. Kaitila (1993) observed that building features such as the rooms' sizes, quality of walls, painting, room height, privacy and kitchen location contribute to the level of dissatisfaction among end-users. Dissatisfaction due to social problems, crime, and safety has also been observed (Russell, 2010).

A dwelling that is adequate from the design perspective may not necessarily be satisfactory to end-users. The concept of satisfactory housing is related to the physical, architectural and engineering components of the house, social, behavioural, cultural and personal characteristics of the inhabitants, and the components of the environment and the nature of institutional arrangements under which the house is managed. Assessing housing satisfaction entails evaluating the level of end-users satisfaction for a housing unit with defined building features, located in a particular neighbourhood, with socio-cultural amenities and under an institutional management and is important for design improvement and innovations in housing projects (Ilesanmi, 2010).

Based on the demographic and socio-economic factors (Building Features (BF), Neighborhood Conditions (NC), Social Amenities (SA) and Management systems (MS), attributes and key variables have been developed into a framework. This concept considers the end-user in relation to BF, NC, SA and MS interaction system with the end-user at the heart of the model as a recipient of feedback and function of the cumulative effect of the BF, MA, SA, and NC (independent variable), Increase in the performance quality of the independent variables increases the overall satisfaction of the end-users. The overall satisfaction is directly proportional to the cumulative effect of the independent variables.

The research design considered methodology and methods necessary for addressing the research questions.

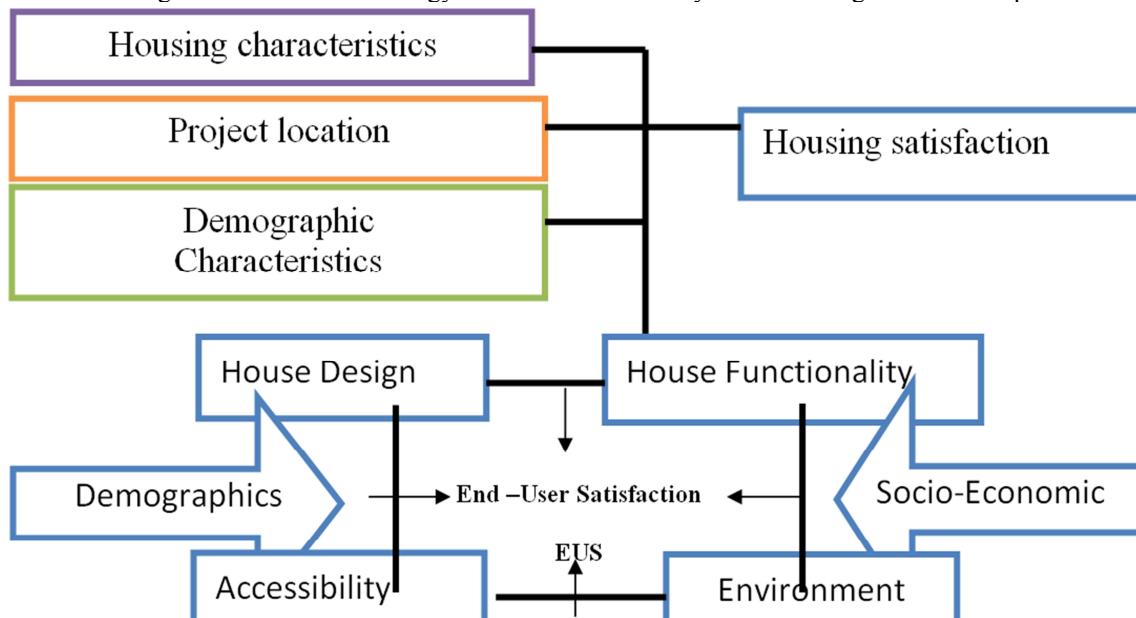


Fig. 1.0 Conceptual framework on end-user satisfaction adopted

4. Research Methodology

The SSNIT housing flats in Asuoyeboa, Kumasi was used as a case study because of the similarity in characteristics, location in the middle belt of Ghana, scale of project, proximity and the middle income end-user class. Purposive sampling approach was adopted together with quantitative method of data collection for the research. Population, sampling method, size, data collection and method of analysis were together considered as follows

Table 1. The Asuoyeboa SSNIT housing project consists of two Block types, 23 Blocks and 554 Flats.

S/No.	Block Category	Number of Blocks	Number of flats	Number of flats used
1	Type I	13	394	20
2	Type II	10	160	18
TOTAL		23	554	38

The large population size of 554, required sampling. Twenty-three (23) Blocks were purposively considered, followed by random sampling of flats in a Block considering the availability of residents and information. A sample size of 38 was obtained and a total of 40 questionnaires administered through two enumerators. Using the Kish (1965) formula; $n = n^1 (1 + n^1 / N)$ where N = the total population size (554 flats);

n = the sample size, $n^1 = S^2/V^2$, V = the standard error of sampling distribution assumed to be 0.05, S = the maximum standard deviation of the population size (Total error of 0.05 @ 95% confidence level), $S^2 = P(1-P)$ where, P = the proportion of the population elements that belong to the defined class. Out of the 554 SSNIT housing Units (flats) at Asuoyeboa, 500 were occupied.

Using the formula above $P = 500/554 = 0.90$ $S^2 = 0.90(1-0.90)$, $S^2 = 0.09$, $n^1 = 0.9/0.05^2 = 36n = n^1(1 + n^1/N)$, $n = 36(1+36/554)$ $n = 38.59$, $n = 38$ questionnaires.

A total of 35 variables were listed and evaluated using a five-point Likert scale. Since the level of end-users satisfaction was to be measured, the Likert scale interval descriptors were designed to accommodate extreme, moderate and neutral responses and ranked as follows: Very dissatisfied- 1, Dissatisfied- 2, Neither Satisfied nor Satisfied - 3, Satisfied - 4, Very Satisfied - 5.

The end-users (tenants) were asked to rank their level of satisfaction concerning the housing attributes, neighbourhood, management, social amenities provided for the community and in addition comment on the housing situation. Thirty-Five (35) families successfully responded representing 88% response rate.

The data obtained through the Likert scale-based questionnaires could be classified as ordinal data, suitable for non-parametric methods, however numerous arguments and examples exist explaining and demonstrating the use of parametric tools for analyzing ordinal data (Göb, McCollin & Ramalhoto 2007:602,603).

Data collected was analyzed using descriptive narration and statistical tools such as one sample statistics means of importance, and tables. The Relative Important Index (RII) of determination of significance of factors was adopted due to its suitability as asserted by other researchers (Adnan et al, 2007; cited in Danso, 2010) as:

$$RII = \frac{\sum W}{A * N}$$

Where: W is weighting given to each factor by respondents ranging from 1 to 5, A is the highest rating and N is the number of respondents. The nearer the value of importance index of the identified factor is unity (1) or 100%, the more significant it is and greater the impact on the rest of variables.

5. Findings and Discussion

5.1 The findings are displayed as Table of Results, Appendix A

Responses for demographic composition of the sample group were 54.29%, 25.71% and 20% for 0-5, 5-10 and 10years and above occupancy respectively. The study further revealed that 60% of the residents are tenants and 40% owners of the apartments. The second part of section A on respondents' level of assessment has been graphically represented.

Table 2. Table showing end-user ranking of satisfaction with Building Features using RII

BUILDING FEATURES	RII	RANK
1. The floor to ceiling height	0.850	1 st
2. Roof Performance (Leakage)	0.849	2 nd
3. Room Finishes	0.820	3 rd
4. Privacy within the house	0.812	4 th
5. The size of rooms (Bed/Living/Kitchen)	0.811	5 th
6. Door and Windows (the size, position and operation)	0.810	6 th
7. Adequacy of artificial light	0.810	7 th
8. Number of rooms in the flat	0.800	8 th
9. The number and placement of the electrical sockets and switches in the room	0.791	9 th
10. Adequacy of daylight distribution	0.790	10 th
11. Finishes to wall	0.781	11 th
12. Finishes to floor	0.762	12 th
13. Adequacy of natural ventilation in the rooms	0.762	12 th
14. Sanitary fittings(number of wash hand basins, etc)	0.750	13 th
15. Ventilation within the Kitchen	0.740	14 th
16. Terraces/balconies	0.514	15 th
17. Outdoor Kitchen/traditional food preparation	0.469	16 th
18. Fire services system(adequacy of fire extinguisher, etc)	0.421	17 th
19. Family areas	0.360	18 th
20. Adequacy of escape routes in case of fire	0.342	19 th

The physical characteristics of housing influence levels of resident satisfaction towards the housing as cited by

Yusof & Johari (2011). Out of the twenty (20) questions set concerning some features of the building users indication of their level of satisfaction were as follows:

The respondents were generally satisfied with the building features. 74.29% were satisfied with the housing characteristics with only 25.71% dissatisfied. This result contradicts the findings by Ukoha & Beamish (1997) where 49% of the respondents expressed dissatisfaction with building features and only 45% were satisfied and agrees with literature that building features such as rooms sizes, quality of walls and painting, room height, privacy and kitchen location contribute to the level of dissatisfaction among residents (Kaitila, 1993). The quality of design by the building industry professionals was highly recommended with the building features achieving a high tenant satisfaction with RII values being more than 0.5. Door, window sizes and positions are believed to affect ventilation in rooms and the level of comfort. Ranked 6th with RII of 0.810 in the table, respondents were satisfied with doors, window openings and sizes provided. The large room sizes, doors, windows sizes and positions and building orientation could account for the good ventilation and that these have a direct relationship with ventilation.

Residents were dissatisfied with some building features as indicated by the RII values. Provision of fire escape route, balconies and terraces had low RII values indicating high tenants' dissatisfaction. It was noticed that there were no fire prevention and fighting devices or any fire service station for the community to fight fire outbreak. The problem was worsened by the fact that the only safe means of escape is through the main entrance. Few residents had fire extinguishers in their flats. This is considered as lapses in design considering the recent rate of fire outbreak in Ghana.

Table 3. Table showing end-user ranking of satisfaction with Building Management using RII

MANAGEMENT	RII	RANK
1. Accessibility of management	0.352	3rd
2. Handling of residents' complaints	0.353	2nd
4. Management response to repairs and maintenance of the building	0.291	4 th
4. Garbage collection system	0.551	1st

End-users response revealed high level of dissatisfaction towards services provided by the SSNIT housing management. Whereas the results contradict findings by Husna and Nurizan (1987) on public housing in Kuala Lumpur, it agrees with Torbica and Stroh (2001) research which suggested that service is the most important component in determining overall satisfaction. The overall RII of less than 50% indicate the level of dissatisfaction with the management system for the Asuoeyboa SSNIT flats. In agreeing findings by Ukoha and Beamish (1997), garbage collection system in the Asuoeyboa SSNIT flat had the highest RII score (0.551) implying end-users were merely satisfied with the provision. End-users expressed dissatisfaction with Management response to repairs, and handling of residents' complaints was also identified by Salleh *et al* (2011) in their study on public housing in Majlis Bandaraya Ipoh (MBI), Malaysia and maintenance of the housing facility.

End-users were thus dissatisfied with the management of the community resulting in the cumulative RII below 50.00% (*Table 3*).

Table 4. Table showing end-user ranking of satisfaction with Building Environment/Neighbourhood using RII

NEIGHBOURHOOD	RII	RANK
1. Incidence of crime or burglary	0.666	1 st
2. Sanitation in the vicinity	0.602	2 nd
3. Noise pollution levels	0.595	4 th
4. Drainage	0.571	3 rd
5. Dust pollution levels	0.402	5 th

The environment or neighbourhood is critical in determining end-users satisfaction. The research finding indicates both high levels of dissatisfaction in neighbourhood condition. While end-users are not satisfied with noise, dust, location along the major highway and absence of well-designed social amenities for social gathering, they were satisfied with drainage systems with RII value of 0.703 which is a major problem for some communities in Ghana. This agrees with Savasdisara (1988) finding that, residential satisfaction is determined by environmental factors, predominantly noise and ground vibration caused by traffic. In a study of Danish neighborhood preferences, Aero (2002); cited in Bjorklund & Klingborg (2005) found that quiet environment was the third most important factor in neighbourhood satisfaction. End-users ranked their greatest satisfaction

with low incidence of crime and burglary.

The findings on safety agree with Parkes *et al* (2002) that safety is an important factor in determining satisfaction with one's neighborhood. End-users expressed high satisfaction for security and crime rate in the community and was ranked 1st with a high RII value of 0.801. Cleanliness and hygiene in public housing often become the bone of contention among end-users of these housing units. Findings for this study indicated that end-users were dissatisfied with noise and dust pollution as a result of the on-going construction of the Asuoyeboa roads and interchanges achieving the lowest RII score of 0.412. This result concurs with Salleh, Yusof & Johari (2011) finding that, neighborhood cleanliness contributed to high residents' dissatisfaction.

Table 5. Table showing end-user ranking of satisfaction with Social Amenities using RII

1. Reliability of Water supply	0.657	4th
2. Reliability of Electricity supply/ street lighting	0.654	3rd
3. Availability of Schools	0.731	2 nd
4. Availability of Health facilities	0.742	1st
5. Availability of commercial market and shops	0.542	5 th
6. Park/recreational facility	0.291	6 th

Consistent with Andersen (2008), the findings revealed that, the availability of basic amenities such as schools, hospitals, electricity, water supply, public transport, and access to neighborhood facilities affect the standard of living and hence the level of satisfaction of end-users. Availability of social amenities had high RII values implying end-user satisfaction. Health facilities had the highest score of 0.742(1st), followed by schools (2nd), 0.731, reliability of electricity and water supply (3rd) and (4th) respectively. This perhaps have contributed to the long end-user stay in the SSNIT flats (*table 5*) where 54.29% of respondents indicated that they had lived in their flats for 5years and above. About 60% of respondents were satisfied with the quality of the social amenities in the community. The greatest dissatisfaction of the residents was the absence of recreational facilities (6th) with RII value of 0.291.

5.2 Overall Satisfaction: The respondents were also asked to rate their overall satisfaction taking all the factors discussed above into consideration. The results show that the cumulative effect of the above four subsystems (i.e. Building features, Management, Neighborhood condition & Social Amenities) in the area yielded high end-user satisfaction. 62.9% of the end-users were satisfied living in the Asuoyeboa SSNIT flats. This confirms the findings by Awotona (1991) that there is interplay between dwelling unit characteristics, management, environmental and location factors and contributes to high residents' satisfaction. The presence of social amenities, building features, low incidence of crime contributed to the high over all RII. However 25.9% of the respondents were dissatisfied with services and management systems.

5.3 Engineering/Design

In response to request for opinions on suggestions for future designs and housing development end-users were very critical of the absence of three provisions:

- Absence of elevators for the aged, challenged and transportation of goods and furniture
- Lack of terraces, balconies and spaces for outdoor and social gathering and
- Provision of outdoor cooking space for preparation of indigenous food and fufu pounding areas at the upper floors.

On the whole, end-users of the facility were satisfied with most variables of the evaluation criteria of satisfaction.

6.0 CONCLUSIONS

This research identified and assessed the level of satisfaction of housing projects end-users in Ghana using the SSNIT Asuoyeboa flats in Kumasi as a case study. Thirty –five variables identified were grouped under four major areas; building features, socio-cultural amenities, neighborhood or environment and housing management. 88% response rate was achieved with thirty-five families as respondents. The level of satisfaction is the cumulative impact of these variables identified.

Building features: Twenty (20) variables were identified and assessed. Respondents confirmed that variables were related to their level of satisfaction. 62.8% of residents in SSNIT flats Asuoyeboa were generally satisfied with the building design contrary to the Ukoha & Beamish (1997) findings on public housing in Abuja, Nigeria. These variables include room height (1st), roof performance (2nd) finishes to ceiling (3rd) privacy (4th), rooms' sizes (5th), doors and windows openings (6th) natural lighting and ventilation and also reflected in the full occupancy as against Isa and Mohd (2012) findings. There was however, dissatisfaction with provision of outdoor spaces for socio-cultural practices and adequacy of fire escape provisions.

Management system: Four (4) factors were identified and assessed. 49.3% of end-users were dissatisfied with management of the flats with regard to management accessibility and response to repair works in contrast to

findings by Husna and Nurizan (1987) on public housing in Kuala Lumpur. Management of refuse had the highest satisfaction ranking contrary to Torbica and Stroh (2001) assessment.

Environment/Neighbourhood: Five factors were identified and assessed. End-users were satisfied with four factors assessed with low level crime rate ranked highest (66%). Noise and dust pollution were the lowest ranked satisfaction factors. This is attributed to housing project's location along a major highway, the absence of noise and dust buffers and boundary walls.

Socio-cultural/economic amenities: Six factors were identified. End-users were highly satisfied with provision of health facilities (74.2%), schools and electricity/street lighting, however very much dissatisfied with provision of parks for recreation/ community gatherings and well-designed shops/commercial centers (29.1%). End-users stated in addition to identified factors, gated community concept, community parks, provision of terraces and balconies for preparation of traditional meals and gatherings as factors affecting end-user satisfaction.

Recommendations: The study recommends the consideration of location away from major highways, gated communities, the provision of noise and dust buffers, parks for recreation community gathering, provision of terraces and balconies, fire escape routes, elevators for three storey blocks, enhanced management for reduced maintenance and housing deterioration for enhanced end-user satisfaction.

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APENDIX A – DETAILED TABLE OF RESULTS

SN	BUILDING FEATURES	RATINGS/FREQ					Total no. Of Responses	IND	IND (%)	RANK			
		1	2	3	4	5							
HOUSING/ROOM DESIGN													
1	Number of rooms in the flat	0	0	2	31	2	35	0.80	80.00	8th			
2	The size of rooms (Bed/Living/ Kitchen)	0	0	0	33	2	35	0.81	81.14	5th			
3	The floor to ceiling height	0	0	0	26	9	35	0.85	85.14	1st			
4	Privacy within the house	0	0	1	30	3	34	0.81	81.18	4th			
OPENINGS													
5	Doors and Windows(the size, position and operations	0	0	0	34	1	35	0.81	80.57	6th			
LIGHTING													
6	The number and placement of electrical sockets and switches	0	1	3	27	4	35	0.79	79.43	9th			
7	Daylight distribution within the apartment	0	1	1	32	1	35	0.79	78.86	10th			
8	Adequacy of artificial light distribution	0	0	1	32	2	35	0.81	80.57	6th			
FINISHES													
9	Finishes to wall	0	2	2	28	3	35	0.78	78.29	11th			
10	Finishes to floor	0	0	7	28	0	35	0.76	76.00	12th			
11	Finishes to ceiling	0	0	0	32	3	35	0.82	81.71	3rd			
ROOFING													
12	Roofing performance (i.e. leakage)	0	0	0	27	8	35	0.85	84.57	2nd			
VENTILATION													
13	Ventilation within the Kitchen	2	3	3	22	5	35	0.74	74.29	15th			
14	Adequacy of natural ventilation in the room	0	1	8	23	3	35	0.76	76.00	12th			
FITTINGS													
15	Sanitary fittings (number of wash basins, water closet, etc	0	0	11	22	2	35	0.75	74.86	14th			
16	Fire service system (adequacy of fire extinguishers, hose reel	12	8	15	0	0	35	0.42	41.71	17th			
17	Fire escape routes	17	13	4	1	0	35	0.34	33.71	20th			
OUTDOOR SPACES													
18	Terraces/balconies	4	13	12	6	0	35	0.51	51.43	16th			
19	Family areas	19	5	11	0	0	35	0.35	35.43	19th			
20	Outdoor kitchen	12	9	14	0	0	35	0.41	41.14	18th			
MANAGEMENT													
21	Accessibility of management				13	19	2	1	0	35	0.35	34.86	3rd
22	Handling of residents' complaints				19	5	11	0	0	35	0.35	35.43	2nd
23	Management response to repairs and building maintenance				22	11	2	0	0	35	0.29	28.57	4th
24	Garbage collection system				6	9	7	13	0	35	0.55	55.43	1st

THE ENVIRONMENT OR NEIGHBOURHOOD										
25	Incidence of crime or burglary	0	0	3	29	3	35	0.80	80.00	1st
26	Sanitation within the vicinity	0	1	13	21	0	35	0.71	71.43	2nd
27	Noise pollution within	12	9	14	0	0	35	0.41	41.14	5th
28	Drainage	0	4	9	22	0	35	0.70	70.29	3rd
29	Dust pollution levels	12	9	14	0	0	35	0.41	41.14	5th
30	Non-gated community concept	13	19	2	1	0	35	0.35	34.86	6th
31	Location along major highway	23	10	2	0	0	35	0.29	28.57	8th
32	Absence of social space	13	9	15	0	0	35	0.42	41.71	4th
33	Noise pollution	23	11	1	0	0	35	0.29	31.57	7th
^SOCIAL-CULTURAL AMENITIES		RANKINGS/FREQUENCIES					NO. OF			
RANK		1	2	3	4	5	RESP.	RII	RII (100%)	
34	Reliability of water supply	2	2	17	14	0	35	0.65	64.57	4th
35	Reliability of electricity supply	0	0	26	9	0	35	0.65	65.14	3rd
36	Availability of school	0	0	13	21	1	35	0.73	73.14	2nd
37	Availability of Health facilities	0	0	17	11	7	35	0.74	74.29	1st
38	Availability of comm. markets and shops	4	13	12	6	0	35	0.51	51.43	5th
39	Children's park/ Recreational facilities	19	16	0	0	0	35	0.29	29.14	6th

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