

RESIDENTS' SATISFACTION WITH THE SITES AND SERVICES APPROACH IN AFFORDABLE HOUSING

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Abstract

Evaluations of sites and services housing developments in India have concentrated solely on economic criteria, while overlooking indicators of residential satisfaction. This study argues that determining residential satisfaction from the users' perspective is mandatory since such projects are frequently replicated and they affect many people.

A survey was administered to a stratified sample of 211 residents of a sites and services housing project (Mogappair). Forty respondents were interviewed in depth. Survey data were analyzed using descriptive and bi-variate (ANOVA) statistical techniques. Qualitative data were content analyzed.

The data indicate that a majority of the respondents are satisfied with their dwellings and the neighborhood. However, many respondents are dissatisfied with services, thereby challenging a guiding tenet of the sites and services approach. The data also suggest that design participation is effective only when supported by relevant design education.

Introduction

In the early 1970s, the World Bank started funding housing and urban development initiatives in many parts of the developing world. Using Turner's (1976) self-help ideology as a point of departure, the Bank advocated an "aided" self-help approach that was manifested in two ways. The first approach—slum up gradation—involved *in situ* (on existing site) improvement programs with minimal displacement. The second approach entailed the provision of housing-related infrastructure, so that people house themselves while adhering to some minimum standards advocated by the Bank and the local governing agency. This approach, termed "sites and services," underlies current affordable housing developments in the Third World.

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Under the aegis of the sites and services approach, the World Bank is involved in the provision of numerous low-cost housing projects in India. Past evaluations of such housing sponsored by the World Bank were based solely on economic criteria. Cost-benefit analyses coupled with economic recovery assessments represent just one means of evaluating the effectiveness of such mass housing initiatives. While fiscal soundness or political viability cannot be ignored, these and other desirable criteria are unlikely to be met when the residents are not satisfied with their housing (Francescato, Weideman, Anderson, & Chenoweth, 1975). In addition, residential evaluations are extremely important in mass housing, since these environments affect many people and such projects are likely to be frequently replicated (Friedman, Zimring, & Zube, 1978).

One way of determining the degree to which residents' housing needs are fulfilled is through a comprehensive evaluation conducted primarily from the users' perspective. Residential satisfaction is the absence of complaint, or an explicit statement that a person likes his/her housing (Schorr, 1970). Canter and Rees (1982) define residential satisfaction as "a reflection of the degree to which the inhabitants feel their housing is helping them reach their goals" (p. 185). Morris, Winter, Whiteford, & Randall (1990) indicate that "satisfaction measures a household's affective state with respect to the degree which current housing meets norms" (p. 4). When used in association with other kinds of observations, measures of satisfaction provide additional leads and insights regarding experience with housing. This study argues that *besides economic criteria, residential satisfaction is a robust indicator of the success of affordable housing developments*. This study represents the first-ever effort to empirically determine residents' satisfaction with sites and services housing efforts in India. For the purposes of this paper, the terms "affordable housing" and "low-cost housing" are used interchangeably.

Literature Review

In the case of residential satisfaction, the unit of analysis usually includes some part of the neighborhood as well as the residential structure (Marans, 1976). Consequently, residential environments are typically discussed in terms of a hierarchy of units, such as dwelling, neighborhood, city, and region.

Numerous housing evaluation studies have been conducted in the United States, Canada, and the United Kingdom. The following is not an exhaustive discussion of these studies but rather a brief review of some highlights of the more significant housing evaluations.

Housing studies conducted by Sopher (1979), Francescato, Weidemann, Anderson, & Chenoweth (1980), Weidemann and Anderson (1982), and Cooper and Sarkissian (1986) indicated that friendliness of neighbors was the most significant factor that influenced residents' satisfaction with housing in the neighborhood. For example, Weidemann and Anderson reported that people experienced a greater sense of belonging when they were on friendly terms with their neighbors.

The housing literature presents conflicting positions regarding the importance of factors such as neighborhood safety and length of stay in influencing residents' satisfaction with their neighborhood. For example, Friedman (1981) articulated that neighborhood safety was the most influential criterion for choosing a place to live. On the other hand, Burby and Weiss (1976) and Weidemann and Anderson (1982) found that neighborhood safety ranked sixth among the most significant factors related to neighborhood satisfaction. With regard to residents' length of stay and neighborhood satisfaction, Kasarda and Janowitz (1974), Marans and Rodgers (1975), and Relph (1976) asserted that length of stay was positively associated with neighborhood satisfaction. These researchers argued that the longer the stay, the higher the level of neighborhood satisfaction. However, studies of subsidized housing in Canada (Onibokun, 1976) indicated that longer stays contributed to lower levels of neighborhood satisfaction.

The importance of home ownership and its profound influence on residential evaluation have been the focus of some housing studies. Based on their study of housing in the United States, Galster and Hesser (1981) showed that when compared to renters, owners were more satisfied with their neighborhoods.

The relationship between house size and residents' dwelling satisfaction has been reported through studies conducted by Weidemann and Anderson (1982) and Rossi (1980). Specifically, Weidemann and Anderson identified the amount of space available within the unit as the most important factor contributing to dwelling satisfaction. Likewise, Rossi argued that the most important factor influencing households to move was dissatisfaction with the amount of space in the dwelling.

In developing nations, housing studies have not had a long history and, in addition, most studies related to affordable housing have focused on issues such as displacement, government intervention, and the effects of housing policies. Research that specifically emphasizes housing satisfaction is scant. Some studies of residents' housing satisfaction in developing countries are presented below.

To understand what residents want from low-income housing developments, Andrews and Phillips (1970) studied the *barriadas* (squatter settlements) of Lima, Peru. Based on residents' assessment of public and private services, the researchers computed two dissatisfaction indices for each service (*extent* and *intensity* of dissatisfaction). The location of medical services ranked highest on the dissatisfaction indices, and the residents' major concern was with distance to (or access to), rather than with quality of medical services. The study also highlighted that the priorities of the residents did not always coincide with those of policy makers.

Western, Weldon & Haung's (1974) evaluation of low-income housing in Singapore identified six factors that contributed to housing satisfaction in particular and to environmental satisfaction in general. In order of decreasing importance, these factors included: i) general satisfaction with dwelling characteristics, ii) ease of access to the city and city-wide services, iii) location and adequacy of basic local facilities and services, iv) quality of services, v) services for children, and vi) public transportation facilities. In addition, the research highlighted that different housing forms, varying from flats in high-rise structures to rooms or cubicles in older shop-houses, seem to

have little effect on residents' satisfaction with their environment. They also asserted that residential satisfaction tended to be higher when the present situation was judged to be more favorable than the previous one.

In their study of public high-rise residential developments in Hong Kong, Yeung and Drakakis-Smith (1982) focused on housing standards for affordable housing developments. They found that low housing standards created slums which in turn led to low levels of housing satisfaction.

The importance of residents' participation in the housing process has been the focus of some evaluation studies. For example, Muoghalu (1984) studied public low rise housing developments in Nigeria, with the specific objective of elucidating the relationships between the objective attributes of the dwelling units and residents' satisfaction. He found that two thirds of the residents were very dissatisfied with their dwelling units. He explained that the low satisfaction levels resulted from the failure of technocrats to consult the residents during the design process.

Al-Saati's (1987) study of subsidized housing in Saudi Arabia discussed the influence of numerous neighborhood and dwelling factors on residential satisfaction. He found that ownership was the most frequently mentioned positive dwelling feature. Residents often cited the security, self-esteem, and prestige associated with owning a house. Al-Saati also found that longer stays contributed to lower levels of neighborhood satisfaction.

Research Setting

The empirical study was conducted with the residents of a sites and services housing development (Mogappair), located in Madras (state capital of Tamil Nadu, India). The World Bank and the Tamil Nadu Housing Board, who sponsored this project, provided the infrastructure such as roads, electricity, drainage, transportation, schools, and other facilities. The construction of the individual dwelling units was the responsibility of the residents.

Mogappair was chosen as the research site because it has received tremendous attention as a prototype for affordable housing in the developing world. For example, Vaessen (1989) stated that "the World Bank considers its urban development project in Madras a showcase," (p. 15).

The Sites and Services Program in Mogappair

The three objectives that underlie the sites and services program in Mogappair include:

- 1) provision of affordable housing for the economically weaker sections,
- 2) achievement of full cost recovery, and
- 3) replicability through the creation of a revolving fund.

Mogappair East, the focus of this study, was started in 1981 at an approximate cost of Rs. 82,141,000 (approx. \$ 2.5 million; Rs. 34 = one US dollar). The project has ten major blocks with a total of 5062 plots (parcels of land). The first plots were allocated in 1983 and each plot has individual water, sewer, and electrical connections. In addi-

tion, public utilities such as roads, street lighting, and storm water drains, are provided. The project plan includes the provision of a community hall, high schools, primary schools, pre-schools, a cinema theater, facilities for farmers' markets, a bus shelter, a police station, a post office, places of worship and a fire station.

The allottee is bound by a lease-cum-sale agreement requiring monthly payments to the government. These monthly payments support fiscal viability through cross-subsidy. The cross-subsidy approach advocates housing development targeting different levels of low-income groups ("higher" low income, "lower" low income, and economically weaker sections). The rationale is that fiscal balance can be achieved by the higher income groups paying slightly more than their fair share (factored on annual household income) and therefore partly subsidizing the lower income groups who pay less than their share.

As per the operational guidelines, a plot of land, once assigned/allotted and accepted by the allottee, is non-transferable and cannot be sub-divided or sublet. However, this "rule" is often violated since most residents are able to make the monthly payments only by renting or subletting a portion of their land. In part, the plot owners are driven to such measures because failure to make monthly payments for two consecutive months results in immediate eviction. The government devised such a seemingly severe strategy in order to achieve a reasonable degree of cost recovery.

The allottee is required to begin house construction within six months from the date of allotment. Temporary building materials are not allowed, partly because the World Bank wants to avoid criticism that it is fostering the creation of slums. A self-help approach is advocated so that the residents can build according to their own pace and financial means.

A fundamental premise underlying the self-help strategy is that people have to be actively involved in the design and creation of their homes. Greatly influenced by Turner's (1976) *Housing by People*, the rationale is that in low-cost housing, residents' participation in the design and creation of their housing not only enhances the degree of residential satisfaction but also leads to more sustainable housing development.

Research Model

The housing literature (e.g. Marans and Rodgers, 1975; Onibokun, 1976; Weidemann and Anderson, 1985) indicates that a person's unique characteristics and the attributes of their socio-physical environment influence or affect the ways in which the environment is used (resulting behavior). Residential assessments are conducted on the basis of a number of factors, and typically such evaluations represent ratings of an array of environmental attributes. These environmental attributes include, but are not limited to, the specific physical, social, cultural and other features of the environment, at both the micro and the macro levels.

The case study approach is fairly typical in housing evaluations and, generally, methodological considerations have prevailed over theoretical issues. In addition, the substantive impetus for most housing evaluations has been through conceptual models rather than theories.

The research model presented in Figure 1 indicates the relationships between, as well as operationalizes, the variables of interest: person characteristics, socio-physical environment, behavior, and residential satisfaction. *Person characteristics* included both respondent and household characteristics. Respondent characteristics focused on the respondent's education, gender, employment, and household status. Household characteristics included family size and composition, family income, living arrangements, tenure status, and length of stay.

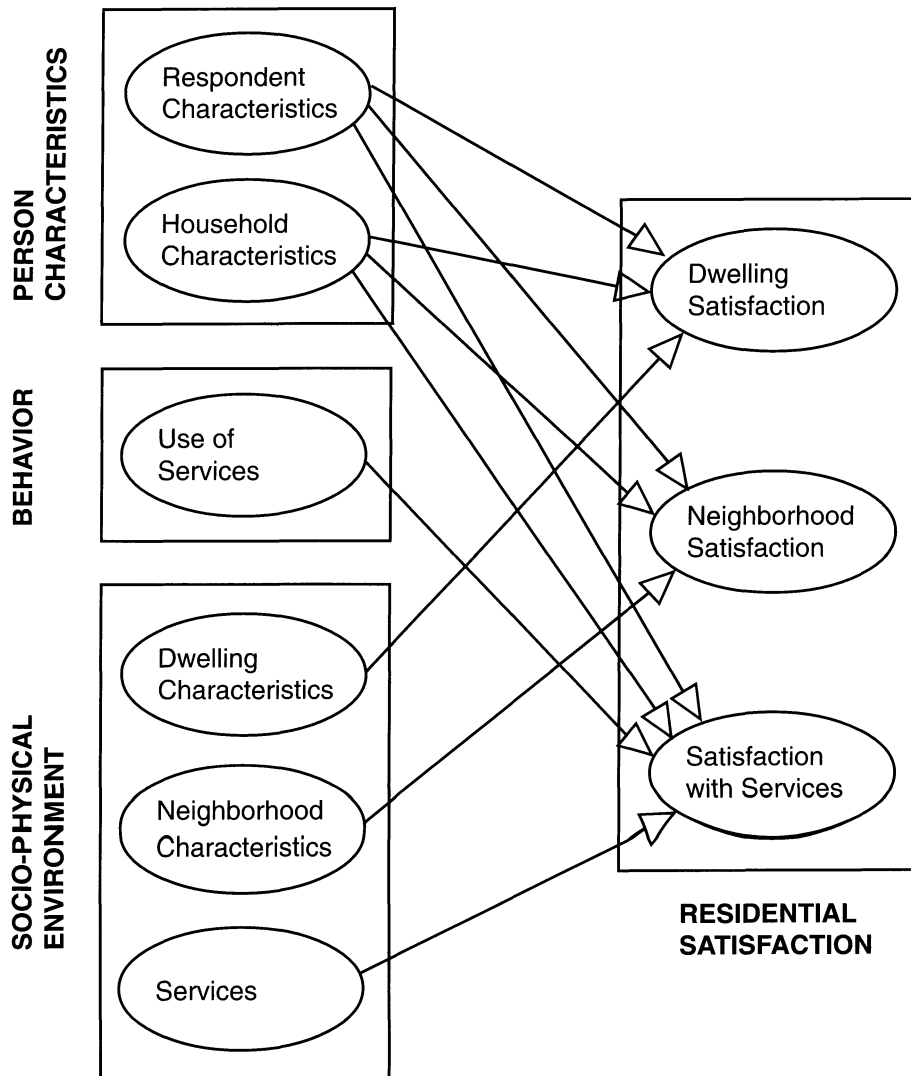


Figure 1. Research Model

Socio-physical environment included many attributes related to the dwelling, the neighborhood, and other services. Both objective and subjective measures were obtained for each of the three categories. For example, objective measures of the dwelling included cost of the house, plot size, size of house, number of rooms, room sizes, storage facilities, and modifications. Subjective measures of the dwelling focused on privacy, satisfaction with the layout, storage, rating of construction quality, most liked and disliked features, and overall dwelling satisfaction.

Behavioral measures focused on the use and frequency of use of the different services in Mogappair.

Residential satisfaction was operationalized as a composite of residents' dwelling satisfaction, neighborhood satisfaction, and satisfaction with services. Instead of a single aggregate measure of residential satisfaction that suppresses the specific contributing dimensions, data related to separate measures of residents' satisfaction with the neighborhood, the services, and the dwelling were collected.

The data were collected in summer 1993 using surveys and in-depth interviews. A stratified sample of 225 households was systematically selected from the population of 450 households (in one block of Mogappair). A six-part questionnaire comprising both open-ended and fixed-choice questions relating to demographics, the dwelling units, the neighborhood, services available, use of services, and previous housing was administered through personal interviews conducted in the residents' homes. The survey process yielded 211 completed interviews (94% response rate) from which a subsample of 40 respondents was selected for in-depth interviews.

Data Analysis

The survey data were analyzed using descriptive and bi-variate (Analysis of Variance—ANOVA) statistical techniques. ANOVA helped identify the nature and/or magnitude of the relationships between specific variables and residents' satisfaction with the dwelling, the neighborhood, and the services. Qualitative data extracted from the in-depth interviews were content analyzed.

Respondent Characteristics

Fewer than half (46%) of the survey respondents were male. A majority (96%) of the male respondents were employed, whereas only 28% of the female respondents were employed. A typical respondent had at least eight years of schooling, and male respondents were more educated than female respondents.

A typical household was comprised of three adults and two children, and 70% of the survey respondents belonged to nuclear families. The average monthly household income was Rs. 2750 (approx. US \$80 ; Rs. 34 = one US dollar). The average length of stay in Mogappair was four years. Two out of three (62%) respondents owned their homes.

Findings

Survey data corroborated by qualitative data from the in-depth interviews indicate that residents were satisfied with certain components of their housing and dissatisfied with others. As mentioned previously, instead of a single aggregate measure of residential satisfaction that suppresses the specific contributing dimensions, separate measures of residents' satisfaction with the neighborhood, the services, and the dwelling are reported. In most instances, income level ("higher" low income, "lower" low income, economically weaker sections) was not a significant factor influencing residents' evaluation of different aspects of their housing.

Residents' Evaluation of their Dwellings

Ownership was frequently mentioned (57%) as the most positive (or liked) feature of the dwelling (Table 1). For example, during the in-depth interviews, respondents remarked:

If this same house was a rented house, I would have a lot of problems with it. Since it is my own house I am willing to overlook many of the problems and I have come to like the house—mistakes and all.

We own this house. Therefore we are forced to like it and not to complain about what it does or does not have.

Everything about this house is nice. This is our own house. How can we say that we do not like anything about this house?

**Table 1. Liked Features of the Dwelling
(content analysis of responses to open ended questions)**

Dwelling Feature	No. of Mentions	Percentage
Own House	95	57.0
Independent House	21	13.0
Custom Built House	15	8.5
Cheaper Rent	3	7.5
Good Ventilation	12	7.0
Others (good landlord, privacy, etc.)	12	7.0
Total	168	100%

**Table 2. Disliked Features of the Dwelling
(content analysis of responses to open ended questions)**

Feature	No. of Mentions	Percentage
Row House	72	19.5
Shared Drainage	67	17.5
Small House/Plot	52	13.0
Toilet Location	49	12.5
Reduced Privacy	40	10.0
Others (reduced storage, inadequate lighting, inadequate ventilation, etc.)	108	27.5
Total	388	100%

Features of the dwelling that were disliked included (Table 2), among others, the row house arrangement (19.5%), shared drainage (17.5%), small plot size (13.0%), and the location of the toilet in front of the house (12.5%).

Overall, three out of four respondents were satisfied with their house; the factors or attributes contributing to their satisfaction included both objective and subjective dwelling features. Specifically, the number of rooms appeared to be the most significant and the amount of indoor storage the least significant dwelling features that influenced respondents' dwelling satisfaction (Table 3).

As expected, respondents in bigger houses were more satisfied with their dwelling than were those in smaller houses. Not surprisingly, house size was directly related to residents' household income. Residents belonging to the "higher" low income category had bigger houses than did those belonging to the "lower" low income or economically weaker sections, and hence they were more satisfied with their dwellings.

Ratings of the house layout were the most significant, and the amount of indoor privacy the least significant, attributes that influenced dwelling satisfaction (Table 4). The favorable ratings of the quality of construction could be due to the enforcement of strict guidelines that prohibit the use of substandard to temporary building materials. Respondents who rated the layout of their house more positively were more satisfied with their dwellings. Similarly, in terms of ratings of house size and indoor storage, respondents with more positive ratings were more favorable in their assessment of their house.

**Table 3. Dwelling Characteristics and Overall Dwelling Satisfaction
(from ANOVA)**

Characteristic	Means*	F-Value	Significance
<u>Number of Rooms</u>		7.60	0.0001**
One room	2.35		
Two rooms	2.04		
Three rooms	1.78		
More than 3 rooms	1.67		
<u>House Area</u>		4.48	0.0017**
Less than 350 sq. ft.	2.29		
350-500 sq. ft.	2.15		
501-700 sq. ft.	1.71		
701-1000 sq. ft.	2.09		
More than 1000 sq. ft.	1.69		
<u>Toilet</u>		6.05	0.0148**
Attached	2.04		
Detached	2.24		
<u>Separate Kitchen</u>		4.97	0.0268**
Yes	2.06		
No	2.26		
<u>Storage</u>		2.61	0.0368**
Less than 25 ft.	2.22		
26-50 ft.	2.04		
51-75 ft.	1.74		
76-100 ft.	2.08		
More than 101 ft.	2.09		

* The lower the score, the higher the mean rating of satisfaction

** Statistically significant at the 0.05 level.

Table 4. Ratings of Dwelling Features and Overall Dwelling Satisfaction (from ANOVA)

Ratings of Dwelling Features	Means*	F-Value	Significance
<u>Layout of the House</u>		11.77	0.0000**
Good	2.02		
Fair	2.24		
Poor	2.72		
<u>Size of the House</u>		8.93	0.0002**
Good	1.99		
Fair	2.29		
Poor	2.34		
<u>Indoor Storage</u>		8.92	0.0002**
Good	1.97		
Fair	2.21		
Poor	2.36		
<u>Quality of Construction</u>		5.82	0.0035**
Good	2.08		
Fair	2.17		
Poor	2.78		
<u>Indoor Privacy</u>		4.20	0.0163**
Good	2.05		
Fair	2.22		
Poor	2.34		

* The lower the score, the higher the mean rating of satisfaction.

** Statistically significant at the 0.05 level.

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More than half the respondents (61%) who were interviewed in depth made mistakes while designing their house because they did not have much information at hand. According to one respondent:

I did the entire design and I supervised the construction. I forgot about providing windows. I cannot believe that the builders blindly followed my orders, and did not bring it to my attention. Building houses is their business—couldn't they have alerted me that my house has not windows? It is so dark inside and there is no ventilation. I feel bad to complain because I was responsible for the design.

The above respondent had lived in her "windowless" house for five years. Due to financial difficulties, her family had no plans to rectify this situation by providing some windows in the near future.

With the exception of education and family size, none of the personal characteristics (respondent and household-related) were significantly related to respondents' dwelling satisfaction. As Table 5 indicates, there was a direct relationship between education and dwelling satisfaction. Typically, the more educated the respondent, the more satisfied (s)he was with her/his dwelling.

The data also indicated that family size was a significant factor that influenced dwelling satisfaction. However, the nature of this relationship was not very straightforward. Specifically, respondents in mid-sized families were more satisfied with their dwellings than were those in small or large families.

Residents' Evaluation of the Neighborhood

Friendly and helpful neighbors were frequently cited (71%) as the most positive features of the community (Table 6). The lack of cleanliness (23%), bothersome neighbors (18.5%), and lack of safety (18.5%) were mentioned as drawbacks in the neighborhood (Table 7).

Overall, four out of five respondents were satisfied with the neighborhood. Bivariate analyses (ANOVA) identified some of the significant relationships between specific neighborhood attributes, personal characteristics, and neighborhood satisfaction. In order of decreasing significance, the critical neighborhood attributes related to neighborhood satisfaction were: friendly neighbors, neighborhood layout, access to relatives, and neighborhood safety (Table 8). The results indicate that the more favorable a respondent's rating of a neighborhood attribute, the greater the neighborhood satisfaction.

The friendliness of neighbors was the most significant factor that influenced neighborhood satisfaction. Typical comments included:

We are blessed with very cordial and helpful neighbors. We are like one big family.

People are very friendly. We look out for each other.

Neighborhood safety, though a significant variable influencing neighborhood satisfaction, was relatively the least important factor.

Table 5. Respondent and Household Characteristics and Overall Dwelling Satisfaction (from ANOVA)

Respondent/Household Characteristics	Means*	F-Value	Significance
<u>Education</u>		2.41	0.0217**
Less than Primary School	2.31		
Middle School	2.05		
High School	2.02		
Tech/Some College	1.90		
College Degree	1.98		
<u>Family Size</u>		2.87	0.0590**
Small (3 members or less)	2.32		
Mid-sized (4-5 members)	2.06		
Large (6 or more members)	2.13		
<u>Tenure Status</u>		1.79	0.1812
Owner	2.08		
Renter	2.19		
<u>Length of Residence</u>		1.33	0.2602
Less than 3 years	2.13		
Three-five years	2.03		
Five-seven years	2.18		
More than seven years	2.07		
<u>Family Type</u>		1.29	0.2777
Nuclear	2.14		
Extended	2.11		
Group	1.00		
<u>Monthly Income (Rupees)</u>		1.14	0.337
0-999	2.15		
1000-1999	2.14		
2000-2999	2.23		
3000 and above	1.92		
<u>Gender</u>		0.37	0.5443
Male	2.09		
Female	2.15		
<u>Employment Status</u>		0.35	0.555
Employed	2.15		
Not-employed	2.09		
<u>Head of Household</u>		0.05	0.8156
Yes	2.14		
No	2.12		

* The lower the score, the higher the mean rating of satisfaction.

** Statistically significant at the 0.05 level.

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**Table 6. Liked Features of the Neighborhood
(content analysis of responses to open-ended questions)**

Feature	No. of Mentions	Percentage
Friendly Neighbors	104	44.0
Helpful Neighbors	64	27.0
Good Layout	59	25.0
Others (proximity to relatives, access to friends, etc)	8	4.0
Total	235	100%

**Table 7. Disliked Features of the Neighborhood
(content analysis of responses to open-ended questions)**

Feature	No. of Mentions	Percentage
Not Clean	38	23.0
Bothersome Neighbors	30	18.5
Proximity to Lower Income Families	30	18.5
Lack of Safety	25	15.0
Lack of Community Spirit	22	13.5
Noisy	17	11.5
Total	162	100%

Table 8. Ratings of Neighborhood Characteristics and Overall Neighborhood Satisfaction (from ANOVA)

Ratings of Features	Means*	F-Value	Significance
<u>Friendliness of Neighbors</u>		11.74	0.0000**
Good	1.92		
Fair	2.08		
Poor	2.54		
<u>Neighborhood Layout</u>		7.15	0.0010**
Good	1.92		
Fair	2.06		
Poor	2.29		
<u>Access of Relatives</u>		3.35	0.0369**
Good	1.89		
Fair	2.01		
Poor	2.13		
<u>Neighborhood Safety</u>		2.71	0.0691***
Good	1.98		
Fair	1.97		
Poor	2.18		
<u>Access to Friends</u>		2.20	0.1130
Good	1.94		
Fair	2.02		
Poor	2.13		

* The lower the score, the higher the mean rating of satisfaction.

** Statistically significant at the 0.05 level.

*** Statistically significant at the 0.10 level.

Respondent characteristics such as education and head of household were significant influences on neighborhood satisfaction (Table 9). Respondents who were household heads were less satisfied with the neighborhood than were those respondents who were not household heads. The data indicate that there is no significant relationship between residents' length of stay and their satisfaction with the neighborhood. Male and female respondents did not differ significantly in their assessment of neighborhood satisfaction. In addition, there was no significant difference between owners and renters in their assessment of and satisfaction with their neighborhood.

Residents' Evaluation of Services

The schools and the shopping facilities were considered most satisfactory (Table 10); respondents were least satisfied with the water supply, roads, and the bus system.

The severe water problem in Mogappair was the single most frequently mentioned service that people were most dissatisfied with and most concerned about (Table 11). However, since water scarcity was a city-wide problem, it cannot be considered a problem unique to Mogappair. To alleviate the water scarcity most, if not all, of the residents of Mogappair had a well in their house. Due to the indiscriminant drilling of wells, the water table in Mogappair was at an all-time low and the water quality was not very good.

Due to faulty layout of drains, sewage water seeped into the drinking water pipes; consequently, the drinking water was often contaminated (Table 11). Cases of amoebiasis and other water-borne infections were commonly mentioned. Other sources of public water supply such as the Metro and the Corporation water systems were erratic and insufficient.

The roads in Mogappair were severely criticized by the respondents (Table 11). The bad roads, coupled with the ineffective drainage system, have led to pools of stagnant water on the roads, which one respondent jocularly labeled "the only landscape elements in Mogappair."

The bus system was far from satisfactory and was mentioned frequently. The limited number of buses and the infrequent bus service were commonly cited complaints. The lack of an alternate mass transportation system was also underscored by some respondents. Since bus strikes had been common in the recent past, respondents were concerned that they have such limited access to the city.

The unofficial crime rate in Mogappair was high. The squatters living in incomplete and unauthorized buildings have added to the perception that there are "undesirable elements" in the community. Residents believed that because the people belonged to different socio-economic classes, there were bound to be problems and frequent clashes. Therefore, a mediating agent such as a police station was considered critical. There was no police station in Mogappair—there was a building for the police station, but there were no personnel. Petitions and referenda from the respondents to the concerned authorities have not been fruitful.

Table 9. Respondent and Household Characteristics and Overall Neighborhood Satisfaction (from ANOVA)

Respondent/Household Characteristics	Means*	F-Value	Significance
<u>Education</u>		2.13	0.0419**
Less than Primary School	1.99		
Middle School	2.01		
High School	2.08		
Tech/Some College	2.13		
College Degree	1.99		
<u>Head of Household</u>		3.95	0.0482**
Yes	2.12		
No	1.96		
<u>Tenure Status</u>		2.65	0.1049
Owner	2.08		
Renter	1.95		
<u>Length of Residence</u>		1.21	0.3097
Less than 3 years	2.08		
Three-five years	1.93		
Five-seven years	2.12		
More than seven years	1.84		
<u>Family Type</u>		1.17	0.3098
Nuclear	2.03		
Extended	2.03		
Group	1.00		
<u>Occupation (Sector)</u>		1.11	0.332
Formal	2.13		
Informal	2.00		
<u>Gender</u>			0.9176
0.3392			
Male	2.06		
Female	1.99		
<u>Employment Status</u>		0.77	0.3827
Employed	2.06		
Not-employed	1.99		
<u>Family Size</u>		0.29	0.7478
Small (3 members or less)	1.97		
Mid-sized (4-5 members)	2.05		
Large (6 or more members)	2.02		
<u>Monthly Income (Rupees)</u>		0.43	0.7859
0-999	1.99		
1000-1999	2.06		
2000-2999	1.96		
3000 and above	2.03		

* The lower the score, the higher the mean rating of satisfaction.

** Statistically significant at the 0.05 level.

**Table 10. Most Satisfactory Services and Facilities
(content analysis of responses to open-ended questions)**

Service/Facility	No. of Mentions	Percentage
Private Schools	209	43.0
Shops	200	41.0
Medical Facilities	49	10.0
(Other: phone, bus, bank)	27	6.0
Total	485	100%

**Table 11. Least Satisfactory Services and Facilities
(content analysis of responses to open-ended questions)**

Service/Facility	No. of Mentions	Percentage
Water supply	203	25.0
Roads	172	21.0
Bus System	129	16.0
No Post Office	93	11.0
No Garbage Disposals	90	11.0
No Police Station	49	6.0
Limited Medical Facilities	47	6.0
Other (lack of community hall, parks, places of worship, etc.)	24	4.0
Total	807	100%

The lack of a post office and a fire station were mentioned frequently. Approximately three years ago, the first drop-off post boxes were installed in Mogappair. While the development plan of Mogappair showed sites for the post office and fire station, even after a decade these plots remain vacant. Some of the plots that were specifically designated for these public facilities have been sold as residential plots.

The playgrounds are not well maintained. Some residents cannot identify the playgrounds and those who can are reluctant to use them. The lack of greenery and other landscape elements in the community was considered a critical drawback but not a top priority concern, except by a few respondents, one of whom eloquently stated:

We need a beautiful children's park in this area. Children have no place to play. How we can expect them to be mentally fit unless they have the opportunity to be physically fit? At the same time, adults, working or otherwise, need some relief from their routine life and need to soothe their minds and bodies. A lush green, well-maintained park would be such an oasis for the residents of Mogappair.

There were no garbage facilities in Block IV and the lack of garbage receptacles had led some residents to use vacant plots to dispose of their garbage, causing a booming rat and vermin menace in the community. Residents of houses adjacent to vacant plots were especially concerned about the continued practice of using these plots as garbage dumps. During the in-depth interview, one respondent remarked that, "in Mogappair, any vacant land is by default a garbage dumping site."

Bi-variate analyses indicate that the quality and range of, as well as access to, medical services were factors that significantly influenced residents' satisfaction with existing housing-related services. Table 12 presents a numeric summary of the relationship between residents' evaluation of specific services and their overall satisfaction with the services in Mogappair.

When compared to male respondents, female respondents were more satisfied with the services. Respondents who were household heads were less satisfied with the services in Mogappair. However, employed respondents were less satisfied with the services than were unemployed respondents (Table 13). Household characteristics such as composition of the family, size, income, length of stay, and tenure status (owners or renters) did not appear to significantly influence respondents' satisfaction with the services. However, respondents in nuclear families were more satisfied with the services than were those living in extended family situations.

Discussion and Implications

A majority of the survey respondents were satisfied with their dwellings. Home ownership was mentioned as a critical factor influencing respondents' dwelling satisfaction, and this finding is consistent with those reported in the housing literature (Smith and Thompson, 1987). For example, Al-Saati's (1987) study of residents' satisfaction with subsidized housing in Saudi Arabia specified that home ownership was the single most important factor influencing residents' satisfaction with their dwellings.

Despite home ownership being one of the most liked aspects of the dwelling, the bi-variate analyses revealed that owners and renters do not differ significantly in their dwelling satisfaction. This finding contradicts Speare's (1974) conclusion that dwelling satisfaction of residents varied according to tenure status, renters being the least satisfied.

As expected, respondents in bigger houses were more satisfied with their dwelling than were those in smaller houses. This finding further confirms the similar results of numerous housing studies conducted in both developed and developing nations. For example, Weidemann and Anderson (1982) identified the amount of space available within the dwelling unit as one of the more important factors contributing to dwelling satisfaction. Likewise, Rossi (1980) argued that the most important factor influencing households to move was dissatisfaction with the amount of space in the dwelling.

The housing literature indicates that participation in the design and building of one's housing enhances the degree of housing satisfaction (Rodriguez, 1988; Hardie, 1988; Turner, 1976). While this study provides testimony to the above, it also underscores that participation was effective only when backed by relevant information. More than half the respondents faltered while designing their houses because they did not have much information at hand. Many respondents stated that they would have benefited from technical information relating to building construction methods and the properties of different building materials. Despite their willingness to participate in designing their homes, a third of the female respondents complained that their input was not solicited.

The row house arrangement was a frequently mentioned drawback related to dwelling satisfaction. Reasonable explanations include the facts that the sharing of walls contributes to reduced aural privacy and, more important, that the house was not "detached." The privacy, independence, and symbolism associated with a detached house are not unique to India. The importance accorded to land adjoining the house appears to be a widespread phenomenon. Based on his housing studies in the United States, Michelson (1970) reported that irrespective of attitudes to house type, in terms of perception of land, individual preferences vary little; people want a piece of land to do with as they wish.

Four out of five respondents were satisfied with the neighborhood. Bi-variate analyses (ANOVA) identified some of the significant relationships between specific neighborhood attributes, personal characteristics, and neighborhood satisfaction. Neighborhood safety, though a significant variable influencing neighborhood satisfaction, was relatively the least important factor. Previous housing studies have confirmed that neighborhood safety is an important factor affecting the assessment of the neighborhood. However, the relative importance of this attribute is often debated. For example, Friedman (1981) articulated that neighborhood safety was the most influential criterion for choosing a place to live. On the other hand, Burby and Weiss (1976) and Weideman and Anderson (1982) found that neighborhood safety ranked sixth among the most significant factors related to neighborhood satisfaction.

Table 12. Evaluation of Services and Overall Satisfaction with Services (from ANOVA)

Ratings of Service	Means*	F-Value	Significance
<u>Quality of Medical Services</u>		26.72	0.0000**
Good	2.02		
Fair	2.47		
Poor	2.76		
<u>Range of Medical Services</u>		29.53	0.0000**
Good	1.98		
Fair	2.47		
Poor	2.73		
<u>Access to Medical Services</u>		18.06	0.0000**
Good	2.20		
Fair	2.64		
Poor	2.74		
<u>Access to Phone</u>		5.69	0.0039**
Good	2.46		
Fair	2.69		
Poor	2.74		
<u>Frequency of Buses</u>		4.11	0.0178**
Good	2.42		
Fair	2.48		
Poor	2.68		
<u>Access to Schools</u>		3.19	0.0433**
Good	2.57		
Fair	2.69		
Poor	2.72		

* The lower the score, the higher the mean rating of satisfaction.

** Statistically significant at the 0.05 level.

Table 13. Respondent and Household Characteristics and Overall Satisfaction with Services (from ANOVA)

Respondent/Household Characteristics	Means*	F-Value	Significance
<u>Head of Household</u>		6.21	0.0135**
Yes	2.73		
No	2.55		
<u>Gender</u>		5.13	0.0245**
Male	2.71		
Female	2.55		
<u>Family Type</u>		3.65	0.0277**
Nuclear	2.61		
Extended	2.68		
<u>Employment Status</u>		3.69	0.0560***
Employed	2.68		
Not employed	2.54		
<u>Occupation (Sector)</u>		2.39	0.0938***
Formal	2.73		
Informal	2.66		
<u>Monthly Income (Rupees)</u>		1.45	0.2205
0-999	2.68		
1000-1999	2.55		
2000-2999	.69		
3000 and above	2.46		
<u>Length of Residence</u>		1.43	0.2263
Less than 3 years	2.61		
Three-five years	2.60		
Five-seven years	2.66		
More than seven years	2.32		
<u>Family Size</u>		1.02	0.3637
Small (3 members or less)	2.72		
Mid-sized (4-5 members)	2.62		
Large (6 or more members)	2.56		
<u>Tenure Status</u>		0.28	0.5957
Owner	2.64		
Renter	2.60		
<u>Education</u>		0.36	0.8353
Less than Primary School	2.57		
Middle School	2.59		
High School	2.65		
Tech/Some College	2.67		
College Degree	2.69		

* The lower the score, the higher the mean rating of satisfaction.

** Statistically significant at the 0.05 level.

*** Statistically significant at the 0.10 level.

This study indicated that tenure status and length of residence were not significant factors influencing neighborhood satisfaction. The literature on the relationship between the length of residence and neighborhood satisfaction reveals conflicting positions. Some researchers have asserted that the length of residence was positively associated with neighborhood satisfaction (e.g. Relph, 1976; Kasarda and Janowitz, 1974; Marans and Rodgers 1975). Based on their studies of housing in the U.S., these researchers argued that the longer the stay, the higher the level of neighborhood satisfaction. On the contrary, Onibokun (1976) posited that the longer the length of stay the lower the satisfaction. Based on his study of subsidized housing in Saudi Arabia, Al-Saati (1987) remarked that the length of stay had a significant though inverse relationship with neighborhood satisfaction. Residents who stayed for a longer duration were less satisfied with their neighborhood than were those who were relatively short-term occupants.

Tenure status does not influence neighborhood satisfaction significantly. The present data indicate that there is no significant difference between owners and renters in their assessment of and satisfaction with their neighborhood. This position contradicts Galster and Hesser's (1981) assertion that ownership is related to neighborhood satisfaction. Their study of housing satisfaction in the U.S. showed that when compared to renters, owners were likely to be more satisfied with their neighborhood.

More than half (66%) of the respondents who were interviewed in-depth considered their present dwelling unit to be an improvement over their previous house. A majority considered the social character (friendliness of neighbors, access to friends and relatives) of their previous and present neighborhoods to be very comparable. Three out of four respondents were dissatisfied with the existing services and facilities, and two out of three respondents assessed the current services to be worse than the services in their previous housing. A third of the respondents mentioned dissatisfaction with present services as an inducement to moving elsewhere.

Of the three housing components, (dwelling, neighborhood, and services), many respondents considered housing services to be the most important factor influencing overall residential satisfaction. Many respondents explained their choice of better services over dwelling or neighborhood using two issues: control and opportunity. These respondents (owners and renters) remarked that they had more control over their immediate environment. As a result, in most instances, they were able to modify their house to match their needs. However, these respondents believed that they did not exert enough control to bring about the required changes in the level of housing-related services. Their efforts to improve existing and/or to introduce new services in Mogappair have not been fruitful. In addition, respondents who were optimistic that better services may happen over time expressed their frustration over the extremely slow pace of infrastructure development in Mogappair.

The second important factor was opportunity: access to education and employment and, consequently, a better life. An overwhelming majority of the respondents complained that the lack of adequate transportation limited their access to quality education

and employment opportunities. They believed that this lack, in turn, greatly reduced their chances for a better life.

Based on economic criteria (i.e. capital recovery, default rate), the sites and services approach adopted in Mogappair has been hailed as a success. However, this study represents the first effort to evaluate the effectiveness of the sites and services approach through an empirical evaluation of residents' satisfaction with their housing. The data indicate that respondents are satisfied with their dwelling units and the neighborhood but that they are dissatisfied with the housing-related services. The specific implications of the findings in relation to the sites and services strategy are discussed below:

- 1) The sites and services approach mandates the provision of housing-related services and infrastructure by the sponsoring agency (World Bank) and the local housing authority. Services and infrastructure were stop-gap measures that were not in pace with the dramatic increase in the number of households. Consequently, a major component of the residents' dissatisfaction with their housing stemmed from the poor services in Mogappair, and not from their dwellings or the neighborhood.
- 2) Another principle underlying the housing development in Mogappair (and typical to sites and services projects) was the self-help strategy. The self-help approach advocates that residents stage the construction process according to their own pace and financial means. The rationale is that participation in the design and construction of dwellings strongly influences residential satisfaction. However, this study indicates that such participation was effective only if it was supported by relevant information. Lacking relevant technical and design knowledge or access to the same, residents often made costly mistakes. Due to their limited financial capacities, many residents were unable to rectify their mistakes and had to endure drawbacks such as windowless rooms, ill-lit kitchens, damp floors, sagging roofs, and wasted space. Therefore, a combination of design education and design participation is required for the self-help strategy to be effective in such low-income housing developments.
- 3) While residents of Mogappair agree in principle to the cross-subsidy concept, the spatial manifestation of the same is not well received. For example, the higher income households did not favor the clustering of their dwellings with those of lower income households. More than a third of the former commented that the concentration of such large numbers of lower income residents has had a negative effect on the social fabric of the neighborhood. The clustering of residents belonging to different income groups has produced income-based enclaves and stunted social interaction.

This study indicates that, despite being an economic success, residential satisfaction in Mogappair is mixed. Before replication, the results of this study can be used to reorganize affordable housing policies so as to reflect the residents' needs and preferences. Such a step is particularly critical since Mogappair is considered a prototype for

affordable housing and is being replicated in India and in other cities in the developing world.

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