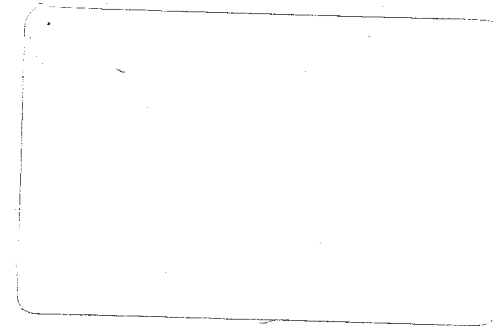


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Housing and Satisfaction with
Environment in Singapore

by

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Introduction

Increasingly urban planners and administrators are being confronted by city dwellers who are unsatisfied with the quality of urban life. Dissatisfaction may be demonstrated in a relatively orderly manner via established bureaucratic channels although less orderly and more vocal forms of protest have also been employed to bring the grievances of citizens to the attention of city governments. Reactions from authorities to these states of affairs have ranged from specific attempts to rectify situations through large scale urban renewal programmes, to inactivity or active suppression of those who make so bold as to complain.

Singapore is a nation, basically a city state, with 80 percent of the population classified as urban, where manifestations of dissatisfaction have not recently been heard. An often cited reason for the relative quiet of the urban population is the government's housing programme which has expanded rapidly in the last decade to the point where today more than 35 percent of the population live in high rise flats administered and generally constructed by the Housing and Development Board (H.D.B.), a statutory board of the government. The programme is far from completed and government policy calls for its continuing expansion.

It is within this context that the present paper originated. Our aims are twofold. First, to describe the construction of

measures of environmental satisfaction, and second to begin to evaluate the impact of the Singapore government's housing policy on people's satisfaction with their urban environment of which housing is an integral part. Given the abstract nature of the concept, environmental satisfaction, it is perhaps not too surprising to find little prior research on which to draw.¹ In an attempt to produce measures of satisfaction with urban environment, therefore, we subjected the data from two studies to the same kind of methodological treatment, factor analysis. The use of this technique in this context follows the work done by Morris and Moge who factor analysed six measures of satisfaction.²

The Data

The studies are the Housing and Development Board Tenant Survey (the H.D.B. survey) and the Central Area Survey, (C.A.S.). The Housing and Development Board came into existence in 1960, when only 9% per cent of the population were accommodated in public housing, and immediately engaged in a massive building program of high rise apartment buildings or flats. These are grouped in areas or estates generally outside the Central Area of the city. In late 1968, the H.D.B., in collaboration with the Economic Research Centre located at the University of Singapore, undertook a survey of tenants in the H.D.B. estates; owners of flats were excluded from the study. The survey was based on a 10 percent systematic random sample comprising a total of 7,410 households. The respondent

was generally the head of the household.³ From this sample a systematic sub-sample of 1,164 cases was drawn for the present analysis.

The second survey was a collaborative venture between the Department of Sociology, University of Singapore, and the Office of State and City Planning, a Singapore Government organization set up to manage the United Nations Development Programme (Special Fund) in Urban Renewal and Development.⁴ This survey focussed on the Central Area of Singapore, which covers about three square miles or about one percent of the total land area. In 1970, about 30 percent of total employment and 12 percent of the total population could be found in this area.⁵ It is characterized by narrow streets and congested and overcrowded shophouses and tenement buildings. And according to a leading government planner: "Because of age, type of materials used for construction, lack of modern sanitation and maintenance, many of these buildings can be classified as being 'ripe for demolition', being also a danger to life and limb".⁶

Within this area a simple random sample stratified by blocks, with a sampling ratio of 1 to 600 persons or 1 to 120 households was selected.⁷ The desired sample size was set at 500 with an estimated rate of incompleteness of 20 percent. An obtained sample of 538 households and 503 individuals was interviewed; in the former, any adult over eighteen years of age could act as a key informant for the household, but individual

respondents were randomly selected, employing Kish's selection guide⁸, for that part of the questionnaire concerned with satisfaction with urban environment. Thus, the respondents in the two surveys are not identical, but both represent important groups of urban residents in Singapore.

In both surveys, respondents were asked to indicate how satisfied they were with different aspects of their environment. The relevant items are listed in Tables 1 and 2 as they appeared in the questionnaires. As can be seen, a large number of the items are identical. It should be noted that there were minor differences in the placement of the questions in the survey instruments. In the H.D.B. survey, all questions were asked in a single series, while in the C.A.S. survey questions were grouped into those concerned with elements of satisfaction related to the area of residence and those related to the unit of residence. This division follows the findings of Morris and Mogeý, namely that "one may distinguish satisfactions centering on the house from those centering on the neighbours and residential community".⁹

It should also be mentioned, as will be apparent from Tables 1 and 2, that the categories on which the items were rated varied slightly.

(Insert Tables 1 and 2 about here.)

Without wishing to dwell for any length of time on the data presented in these Tables, certain comparisons are instructive. On the summary item relating to satisfaction with living

quarters, responses indicating satisfaction are more likely among the H.D.B. tenants than they are among the central area residents. The level of satisfaction with transportation services and nearness to other facilities is approximately the same among both groups while the central area residents are somewhat more satisfied with the price of goods in local shops and markets. With the exception of the first, these are not as substantial differences as one might have expected given the quite marked differences in the two areas.

Let us now return to more central matters: the identification of major dimensions of environmental satisfaction from item clusters and an assessment of whether these are largely consistent across both the Housing Board Estates and the Central Area. Such structural consistency need not be anticipated, of course, given the radically different housing patterns in these two groupings. The procedure employed to identify the satisfaction dimensions and to determine their consistency across the two samples is that of factor analysis with a principle components solution and varimax rotation. There were no special features of the programme used and it was set to disregard factors which had eigenvalues less than one.

There were certain problems in coding the data for purposes of the analysis. As can be seen from Tables 1 and 2, there was a high non-response rate for some questions, particularly those which did not apply to all respondents: for example, those without school age children or those living in lower

floor flats for whom the question about lifts was irrelevant. In all instances, non-reponse was treated as a neutral category between "acceptable" or "somewhat satisfactory" and "unsatisfactory" or "not at all satisfactory" and scored accordingly. This decision resulted in a few of the distributions (e.g., efficiency of lifts) being radically altered, making it unlikely that the item would fit into a larger factor. Two alternative decisions would have been to treat non-responses as missing data or to drop the items with high proportions of non-responses from the analysis. The first alternative was not possible because of a lack of missing data sub routines in the computer programmes available to the authors at the time of the analysis, and the second was rejected because it was felt that in an exploratory study as much information as possible should be retained. There were also two questions which used slightly different responses categories; these were collapsed into three categories consistent with those used for the rest of the question.

Results of the factor analysis

From the H.D.B. data, six factors were extracted accounting for approximately 44 percent of the variance. Details of the factor loadings of the items, eigenvalues and proportion of variance accounted for by each factor are presented in Table 3. The first factor accounts for approximately 16 percent of the variance; the second factor, about 8 percent, and the remaining

(Insert Table 3 about here)

factors, around 4 percent to 6 percent each. The pattern is

quite instructive.

The first factor is defined by four items related to general satisfaction with the flat occupied, the floor on which the flat is located, the block in which the flat is located and the estate itself. No other items have high loadings on this factor, and we propose to describe the factor as a "general satisfaction with dwelling neighbourhood". The most important component of environmental satisfaction among the H.D.B. tenants then is based on satisfaction with the actual flat and its specific floor, block and estate location. In contrast to the earlier cited findings of Morris and Mogeys and of Michelson, H.D.B. tenants do not appear to distinguish between these units in their environment.

The second factor relates to ease of access to certain significant activity areas; nearness to city, to work, and to cinemas, and ease of parking. There are several other items related to the ease of access concept, but they do not have as high loadings as do the four items which define the second factor. For instance, nearness to markets and shops and nearness to clinics load together with other items in a third factor. Nearness to police station does not have a high loading on any factor and the "nearness" items related to schools constitute a separate factor. The lack of conceptual clarity in this second factor cannot be overlooked.

The third factor is more specific and refers to the location and adequacy of basic facilities and services. The

items with high loadings on this factor refer to availability of goods, nearness to markets, shops and clinics, and the prices of goods and services. The mix of location and adequacy items may be partially explained by the nature of the questions. For example, respondents may have responded to the "clinic" part of the "nearness to clinic" question rather than to the "nearness" aspect.

The fourth factor is specifically related to the quality of services and environment in the estates: noise, general cleanliness, facilities for rubbish disposal, ventilation in the flat and public security in the area. The mixing of what might seem to be items specific to a flat, such as noise and ventilation, with items that are related to properties of an area is of interest. It may well be that H.D.B. tenants perceive these problem areas as the responsibility of the Board and the government rather than problems with which the tenants themselves can deal. Since there were no questions in the H.D.B. survey which directly inquired into this general area of responsibility, this kind of suggestion is speculative, but possibly worthy of consideration on the part of the housing authorities.

The fifth factor has to do with services for children; the three items with high loadings being nearness to primary school, nearness to secondary school and playground facilities. Finally, factor six is defined again by two quite specific aspects of public transport: satisfaction with bus services

and satisfaction with taxi services. The six factors and the percentage of variance each accounts for are presented summarily in Table 4.

(Insert Table 4 about here)

It is clear that for H.D.B. tenants there are quite distinct dimensions of environmental satisfaction. Two of these are fairly general, relating to housing in the first place, and to access to significant areas in Singapore in the second. The other four dimensions are much more specific and they concern the location, adequacy and quality of the services that are provided for residents and their children. The question we want to take up now is whether the same sort of structure exists for residents in the Central Area. Are their priorities for satisfaction the same? We need not expect identical results because the questions asked in the two surveys were not identical and because of the radically different housing patterns; nevertheless, there are a sufficient number of similar items, and, all respondents are residents of the same city, so similarities in structure could also be expected.

The results of the factor analysis are presented in Table 5; as can be seen, five factors have been extracted, accounting

(Insert Table 5 about here)

for 57 percent of the variance. The first factor accounts for approximately 25 percent of variance, the second factor for approximately 14 percent, and the other factors for lesser amounts. Clearly, there are differences in the results of the

two analyses. In the first place, a greater proportion of variance has been accounted for in this analysis, and the solution is more parsimonious, since it contains fewer, "stronger" factors. It is particularly noteworthy that the first factor alone accounts for 25 percent of variance, and the second factor for a further 14 percent.

We have called the first factor quality of housing, and it is defined by the first seven items presented in Table 5. These all refer to quite concrete aspects of the Central Area residents' housing: the adequacy of toilet facilities, bathing facilities, cooking space, size of residential unit and so on. The factor does not match completely one from the earlier H.D.B. analysis since the Central Area survey included a number of items not found in the tenant survey. However, the H.D.B. factor somewhat comparable to the above is the fourth factor "quality of basic facilities and services" which only accounted for 5 percent of the variance. The finding may well reflect the physical differences in the two areas: new, high density low income housing estates on the one hand, and old, overcrowded shop houses on the other. Many of the basic facilities have been provided for in the H.D.B. estates and thus this factor should not be expected to constitute as important a part of the tenant's environment as it is of those living in the Central Area.

An alternative interpretation of this first factor might relate it to the first factor, general housing satisfaction,

isolated in the H.D.B. analysis. It should be noted that a general question about overall satisfaction with present living quarters does load on this first factor for Central Area residents. This question is obviously similar to the kinds of questions which constitute the general satisfaction factor for H.D.B. residents.

It is interesting to note, too, that the amount of variance explained by the first factor in the C.A.S. analysis is almost identical with that explained by the two factors we have been considering from the H.D.B. analysis. It might seem reasonable to conclude, therefore, that the quality of housing factor from the Central Area survey can best be thought of as subsuming the general satisfaction and quality of basic facilities and services factors identified in the H.D.B. study.

The second factor extracted in the C.A.S. analysis relates to transport services, and the items defining it are satisfaction with taxi and satisfaction with bus services in the area. This factor is the same as the sixth factor in the H.D.B. survey, although transport services are clearly a more important source of satisfaction/dissatisfaction in the Central Area, as indicated by the differences in the amount of variance explained.

The third factor has to do with schooling, and the two items defining it concern satisfaction with distance from both primary and secondary schools. Again, this is very similar to the fifth factor in the H.D.B. analysis, adequacy of services for children, although the nearness to playground item which

loaded quite highly on this factor in the H.D.B. analysis has its highest loading on the fourth factor in this analysis.

The fourth C.A.S. factor resembles the third H.D.B. factor, location and adequacy of basic facilities and services. As can be seen, the items defining the factor are those dealing with satisfaction with distance from markets, medical services, cinema and playgrounds, and one concerning satisfaction with prices of goods. Factor five has to do with matters of cleanliness and safety: satisfaction with rubbish disposal services, the general cleanliness of the area and personal safety in the area. Items similar to these loaded on Factor four in the H.D.B. analysis. The present factor, however, is somewhat more specific.

Table 6 presents a summary of the factors and the percentage

(Insert Table 6 about here)

of variance accounted for by each. As with the H.D.B. survey, there are quite distinct factors of environmental satisfaction which are clearly differentially important to those living in the Central Area. As noted previously, some of these factors are roughly comparable to those identified earlier and there appear to be large areas of commonality in the way in which H.D.B. tenants and Central Area residents view their environment. To an important extent, both groups evaluate the same aspects though differences have emerged in terms of differential weights given to the same factors by the two groups.

Levels of Environmental Satisfaction

Thus far, we have talked only about the basic components of satisfaction with the urban environment. We have not systematically attempted to measure the degree of satisfaction expressed by the groups, although in Tables 1 and 2, the distribution of responses to the various questions gave an indication of different levels of satisfaction for particular elements. In the present section, we propose to consider this issue more rigorously and determine whether differences exist between the H.D.B. and Central Area residents in their level of satisfaction with the basic factors which have been identified. By comparing satisfaction scores of H.D.B. tenants whose housing consists of high-rise flats with the scores of Central Area residents whose housing consists primarily of shop, row and tenement houses, we can evaluate directly the impact of housing form on satisfaction with the urban environment.

In light of the consistency in the factors of satisfaction identified in the two areas, few differences between the H.D.B. and Central Area residents might be expected. On the other hand, the great difference between the housing patterns in the estates and the Central Area might lead one to expect the former to be more satisfied with their environment; after all, their housing is relatively new and the importance of the housing component in both factor analysis has been clear.

The methodology used is relatively straightforward; a mean score for each factor is obtained from the mean scores of the items defining each factor. The results are shown in Table 7. In general, the scores fall between the "satisfactory" and "acceptable" categories in the H.D.B. survey and between the "very satisfactory" and "somewhat satisfactory" categories in the Central Area survey, indicating a relatively high level of satisfaction for both groups of residents.

(Insert Table 7 about here)

As can be seen, the only factors between which comparisons are quite impossible are the last two, one from each of the analyses. Where comparisons are possible, the differences are not large.* Provisions for schooling are evaluated somewhat more positively by the H.D.B. tenants, although, interestingly, this factor shows the highest dissatisfaction scores for both groups of residents. The location and adequacy of basic facilities and services are seen a little more positively by the Central area residents. It was argued earlier that the factor quality of housing (identified in the Central Area Study) had much in common with the two H.D.B. factors; quality of basic facilities and services and general satisfaction and indeed might subsume them both. Comparing the mean scores on this factor with the mean scores on both the H.D.B. factors

*It should be noted that no tests of statistical significance have been used despite the random nature of both samples since the factors are not completely comparable.

again suggests that the differences are not great, although marginally, the Central Area residents are the more satisfied.

Finally, an unweighted mean of the mean factor scores shows little difference between the two groups, demonstrating that housing form seems to have little effect on residents' satisfaction with their environment.

To explore this last finding further, it was decided to compute the mean scores of each factor for the ten H.D.B. housing estates which were covered in the survey. The results in Table 8 show

(Insert Table 8 about here)

clearly that there is greater variation between estate residents than there is between estate and non-estate residents. Again housing form is shown not to have any consistent relationship with satisfaction with the environment.

It should also be noted from Table 8 that the school factor is the source of greatest dissatisfaction in all estates, but that in certain estates, dissatisfaction with the ease of access to activity areas, is also high relative to other factors and other estates. The general satisfaction measure (which it will be recalled explains the greatest amount of variation in satisfaction) and the location and adequacy of basic facilities and services factor have the lowest mean scores, indicating that residents have higher levels of satisfaction along these dimensions.

The urban planner can be guided by variations of this sort. The planning strategies called for if aspects of the environment which are of critical importance to the residents of urban areas are unfavourably evaluated are presumably different from those required if unfavourable evaluations are made of environmental features which are not of central concern to residents.

Conclusion

While this paper has shown that housing form, as a single phenomenon, does not appear to differentiate the general level of environmental satisfaction among Singapore residents, it would be wrong to conclude that housing has no impact. Before we can do so what must be examined are specific dimensions of housing such as density, number of rooms and household size and other socio-demographic measures such as class, dependency ratio, length of residence, etc.¹⁰ These variables may well predict satisfaction differentially across units such as estates, blocks, and floors, making it necessary to control on these latter variables as well. Important also are societal variables such as the rate of economic growth, employment opportunities and transportation.

The similarity in the conceptualization of the environment (admittedly environment was partially defined, though not ordered in the questionnaire) by residents living in radically different forms of housing would seem to offer encouragement to replication efforts to understand the main components of

environment. Certainly considerable fieldwork will be necessary before any complete conceptualization is accomplished and this conceptualization may well vary with culture, complicating the fieldwork procedures. Nevertheless, in view of the fact that many cities throughout the world are planning large urban housing efforts, though possibly not on the scale of Singapore's programme, we would hope that our attempts to define environment in Singapore offer some guidelines. We would also hope that housing form, per se, is not viewed as a simple key for producing a more satisfied urban population.

Footnotes

*The research for this paper was supported by the Office of State and City Planning, formerly a United Nations Development Programme funded project in the Ministry of Law & National Development, Singapore, and now merged with the Planning Department in the same Ministry. The opinions in this paper are solely those of the authors and in no way can they be considered those of the Government of Singapore.

¹Two studies which specifically attempt to quantify satisfaction with urban environment are Donald Appleyard and Mark Lintell, "The Environmental Quality of City Streets: The Residents' Viewpoint", Journal of the American Institute of Planners, 38 (March, 1972), pp. 84-101, and R.N. Morris and John Mogey, The Sociology of Housing, (London: Routledge & Kegan Paul, 1965). Two studies which seek to define an ideal environment are Mark Hinshaw and Kathryn Allot, "Environmental Preferences of Future Housing Consumers", Journal of the American Institute of Planners, 38 (March, 1972), pp. 102-107 and W. Michelson, "An Empirical Analysis of Urban Environmental Preferences", Journal of the American Institute of Planners, 32 (November, 1966) pp. 355-360. A study on ideal housing is F.C. Ladd, "Black Youths View Their Environment: Some Views of Housing", Journal of the American Institute of Planners, 38 (March, 1972), pp. 108-116.

²Morris and Mogey, op. cit., pp. 135-136

³Unfortunately, there has been no write-up as yet of the sampling procedure used in this survey. It is clear, however, from the instructions given to the interviewers that an adult other than the household head could be interviewed as the key informant for the household when the household head could not be contacted. See Manual of Instructions, Housing and Development Board Sample Household Survey 1968, mimeo., July 1968, Singapore, p. 4. Thus, the sample would appear to be a random one of households, but not of household heads. The degree of this substitution cannot be determined, but is assumed to be low.

⁴This project was featured in the April 1971 issue of the Royal Australian Planning Institute Journal.

⁵Ong Teng Cheong, "Singapore Central Area Planning - Some Major Considerations", Bandar, 2 (December, 1970) p. 5.

⁶Alan F.C. Choe, "Urban Renewal in Singapore", Bandar, 1 (October, 1969), p. 15.

⁷For a description of the sampling technique and check data, see Peter D. Weldon, City Area Survey - Special Report on Sampling, mimeo., September, 1969, Office of State and City Planning, Singapore.

⁸C.H. Backstrom and G.D. Hursh, Survey Research, (Illinois: Northwestern University Press, 1963), pp. 52-58.

⁹Morris and Moge, op. cit., pp. 135-136. Support for this statement from their data is not conclusive as the questions which they factor analyzed cannot be clearly distinguished as related to residence and neighbourhood. Others, however, such as Michelson, op. cit., pp. 358 offer data which indicate that residents clearly differentiate between home and neighbourhood in their conceptualization of an ideal environment.

¹⁰Such an effort has been made by Riaz ul Hassan, "Social Status and Bureaucratic Relationships Among Public Housing Tenants in Singapore", Occasional Paper No. 10 (Singapore: Institute of Southeast Asian Studies, 1972); also abstracted in 33 (March, 1972), pp. 178-181.

ELEMENTS OF SATISFACTION: H.D.B. Tenant Survey (row percentages)

	Satisfactory (1)	Acceptable (2)	Unsatisfactory (4)	Non-responses (3)	Total
Bus service	56	21	21	2	(7,407)
Taxi service	62	28	8	3	(7,407)
Nearness to city	49	41	10	4	(7,408)
Nearness to work	39	37	20	4	(7,408)
Nearness to cinemas	44	33	18	6	(7,410)
Nearness to clinics	69	24	7	10	(7,410)
Nearness to police station	36	27	36	1	(7,404)
Nearness to primary school	34	14	9	43	(7,357)
Nearness to secondary school	16	13	8	64	(7,357)
Nearness to markets	80	17	2	1	(7,394)
Availability of goods	65	28	7	1	(7,394)
Prices of goods	16	65	18	1	(7,394)
Public security	65	26	8	1	(7,404)
Parking facilities	18	11	12	58	(7,415)
Playground for children	22	27	19	32	(7,412)
General cleanliness of bldg.	41	39	20	1	(7,410)
Efficiency of lifts	7	11	28	54	(7,407)
Rubbish disposal	59	28	13	1	(7,410)
Amount of noise	39	36	25	1	(7,412)
Ventilation in flat	59	29	12	1	(7,407)
Opinion on rent**					
Opinion on estate	72	26	3	1	(7,363)
Opinion on block	68	27	5	1	(7,364)
Opinion on floor	62	25	13	1	(7,365)
Opinion on flat	68	24	9	1	(7,405)
**Opinion on rent					
Very Inexpensive	3	10	22	1	
Fairly Inexpensive	10	55	9	1	
About right	55	22	9	1	
Fairly Expensive	22	9	1	1	
Very Expensive	9	1	1	1	
Do not Pay Rent					(7,373)

*The source of these data is Stephen H.K. Yeh, Housing and Development Board Sample Household Survey (Singapore: Economic Research Centre, University of Singapore and Housing and Development Board, January 1969). There are six volumes in this report and a set of summary tables.

Table 2

Elements of Satisfaction: C.A.S. Survey (row percentages)
n = 503

	Very Satisfactory (1)	Somewhat Satisfactory (2)	Not at all Satisfactory (4)	Non-response (3)
Residence				
Housing	49	36	14	1
Cooking space	44	37	12	7
Toilet facilities	45	39	14	1
Bathing facilities	47	39	13	1
Amount of noise	40	38	20	1
Rubbish disposal services	60	29	9	2
Circulation of fresh air in the home	41	42	16	1
Overall satisfaction* with living quarters				
Neighbourhood				
Bus service	56	27	8	9
Taxi service	63	20	4	12
Nearness to cinema	63	21	6	10
Nearness to medical & health services	64	21	7	7
Nearness to primary schools	56	21	11	12
Nearness to secondary schools	29	28	26	17
Nearness to playground for children	34	24	31	11
Nearness to markets, shops & stalls	78	18	2	12
Prices of goods in markets, shops and stalls	30	50	12	7
Personal safety	63	29	4	4
General cleanliness	38	47	13	2

*This was intended to be a summary question and somewhat different response categories were used: very satisfied, 31%; somewhat satisfied, 47%; uncertain, 4%; dissatisfied, 11%; very dissatisfied, 5%; non-response, 2%.

Table 3

Environmental Satisfaction: Factor Analysis of Satisfaction in Housing and Development Board Estates

Factor No.	1	2	3	4	5	6
Eigen Value	3.9	2.0	1.4	1.3	1.2	1.2
Percentage of Total Variance (Cumulative)	15.6	23.5	29.0	34.2	39.1	43.8
Variable	Factor Loading					
Satisfaction with block	.82	.01	-.10	-.11	.01	-.06
Satisfaction with estate	.77	.01	-.16	-.06	-.01	-.12
Satisfaction with flat	.71	-.05	.01	-.28	.07	-.04
Satisfaction with floor	.62	-.20	-.02	-.25	.05	.10
Nearness to work	.13	-.68	-.01	.10	.12	-.10
Nearness to city	.12	-.58	-.08	.06	.04	.40
Parking facilities	-.06	-.47	-.08	-.39	-.10	.00
Nearness to cinema	.11	-.32	-.08	.09	.11	-.04
Availability of goods in markets and shop	.05	-.05	-.70	-.11	.09	-.14
Nearness to markets & shops	.15	.12	-.65	.08	.04	-.14
Prices of goods & services	.00	-.34	-.59	-.06	.09	.10
Nearness to clinics	.12	.08	-.34	-.07	.09	-.13
Amount of noise	.16	.01	.06	-.68	.10	.03
General cleanliness of bldg.	.18	.02	-.13	-.67	-.02	-.06
Rubbish disposal	.11	.03	-.09	-.60	.04	-.08
Ventilation in flat	.33	-.05	.02	-.49	.03	-.05
Public security	.10	.08	-.07	-.37	.02	-.27
Nearness to Primary Schools	-.02	-.17	-.06	-.02	-.72	-.04
Nearness to Secondary Schools	.08	.04	.00	.03	.69	.02
Playground for children	.02	.18	-.10	-.09	.54	-.26
Bus service	.01	-.10	-.09	-.10	.08	.93
Taxi service	.05	-.11	-.08	-.04	.05	-.76
Efficiency of lifts	-.05	-.08	-.12	-.13	-.01	-.05
Opinion on rent	.13	-.02	-.19	.02	.10	-.05
Nearness to police stat.	-.05	-.01	-.02	-.14	.00	.04

Table 4

The Structure of Environmental Satisfaction: H.D.B. Tenants

Factor	Amount of explained Variance (%)
General satisfaction with dwelling neighbourhood	16
Ease of access to significant areas of activity	8
Location and adequacy of basic facilities and services	5
Quality of basic facilities and services	5
Adequacy of services for children	5
Adequacy of transport services	5
Total	44 =====

Table 5

Environmental Satisfaction: Central Area Residents Factor analysis of Satisfaction Items

Factor No.	1	2	3	4	5
Eigen Value	4.7	2.7	1.3	1.1	1.0
Percentate of total variance (Cumulative)	24.9	39.3	45.9	51.9	57.3
Variable	Factor Loading				
Toilet facilities	.87	-.04	.04	.04	.03
Bathing facilities	.87	-.04	.03	.07	-.01
Cooking space	.77	-.06	-.00	.07	.13
Housing size	.69	-.01	.10	-.10	.24
Present living quarters	.62	-.04	.05	.07	.19
Circulation of fresh air	.60	.07	.05	-.01	.29
Amount of noise in area	.53	.17	-.19	.24	.28
Taxi service	-.01	-.85	.11	.14	.12
Bus service	.01	-.85	.05	.11	.15
Nearness to secondary schools	.09	.12	.88	.04	.01
Nearness to primary schools	.02	-.08	.76	.36	.07
Nearness to markets	-.02	-.07	.02	.64	.25
Nearness to medical service	.18	-.40	.12	.61	-.17
Nearness to cinema	-.09	-.42	.17	.58	-.16
Nearness to playground	.03	-.01	.15	.57	.03
Price of goods	.04	-.04	-.05	.44	.37
Rubbish disposal service	.35	.00	.04	.07	.59
General cleanliness of neighbourhood	.35	-.10	-.03	.09	.53
Personal safety	.17	-.20	.08	.02	.67

Table 6

The Structure of Environmental Satisfaction:
Central Area Residents

Factor	Amount of Variance explained (%)
Quality of housing	25
Adequacy of transport services	14
Schooling	7
Location and adequacy of basic facilities and services	7
Safety and cleanliness	5
Total	58

Table 7

Levels of Satisfaction of H.D.B. Tenants
and Central Area Residents

Factor Name	Mean Scores	
	H.D.B.	Central Area
A. General Satisfaction with dwelling neighbourhood	1.47	-
B. Quality of Housing Quality of Basic Facilities and Services	1.80	1.91
C. Schooling Adequacy of Schools and Playgrounds	2.45	2.10
D. Location and Adequacy of Basic Facilities & Services	1.60	1.76
E. Adequacy of transport Services	1.73	1.76
F. Ease of Access to Activity Areas	2.10	-
G. Safety and Cleanliness	-	1.69
Total	1.86	1.84

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Table 8
Levels of Satisfaction of H.D.B. Tenants by H.D.B. Estate

Factor Name	Means of Estate										
	1	2	3	4	5	6	7	8	9	10	Total
General Satisfaction	1.59	1.40	1.37	1.55	1.52	1.34	1.51	1.50	1.45	1.46	1.47
Ease of Access to Activity Areas	2.44	1.97	2.48	2.10	2.06	1.97	1.67	1.89	2.25	2.17	2.10
Location & Adequacy of Basic Facilities and Services	1.65	1.55	1.60	1.62	1.53	1.59	1.59	1.48	1.70	1.73	1.60
Quality of Basic Facilities and Services	2.02	1.74	1.54	1.77	1.78	1.59	1.98	1.87	1.72	1.85	1.80
Adequacy of Schools and Playgrounds	2.48	2.32	2.64	2.32	2.34	2.26	2.38	2.53	2.71	2.63	2.45
Adequacy of Transport	1.72	1.47	2.22	1.61	1.59	1.63	1.70	1.82	1.85	1.69	1.73
Total	1.98	1.78	1.98	1.83	2.02	1.73	1.81	1.83	1.94	1.95	1.86

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