

## UNDERSTANDING DEPENDENCY OF LIVABILITY ON SOCIO-ECONOMIC AND DEMOGRAPHIC PARAMETERS

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### ABSTRACT

Livability is a phenomenon that varies from place to place depending on local context. Planning and designing of residential areas are done to create a built environment that provides livable conditions to its inhabitants. The socio-economic and demographic characteristic of a residential area plays an important role in influencing the inhabitant's perception of livability. Understanding livability in local context is very important and needs to be examined across various demographic and socio-economic strata of a society. The paper explores the perception for livability across various socio-economic and demographic parameters. Inhabitants of the selected residential areas in a case study city were asked to rate the perceived importance of identified livability attributes in contributing towards livability. The importance rating in the scale of 1 to 10 were assigned by inhabitants to listed livability attributes where 1 represents the least important and 10 is most important livability attribute in making a place livable. A quantitative analysis was performed to explore the dependency of livability on socio-economic and demographic parameters.

**KEYWORDS:** Livability, Local Context, Quantitative, Socio-Economic and Demographic Parameters

### INTRODUCTION

The built environment of residential areas is planned designed and developed most often by professionals without involving users both at conception and execution stage of projects. Professional's create built environment which they think contributes best for providing livability in residential areas. The understanding of livability from the perspective of inhabitants is necessary to create the desired livable conditions in residential areas. Livability therefore, needs to be examined across various demographic and economic strata of society.

The foremost criterion for selecting socio- economic and demographic parameter is to ascertain whether livability attributes can be related to that parameter or not. Some of the livability attributes may depend on these while others may not. The importance of some livability attributes remains the same irrespective of type and class of socio demographic parameter.

The objective of paper is to explore the inhabitant's perception for identified livability attributes in Indian context across various socio-economic and demographic parameters. The inhabitant's perception for importance of livability attributes in providing livability is captured through ratings in the scale of 1 to 10 to listed livability attributes where 1 represents the least important and 10 is most important livability attribute in making a place livable. The ratings assigned are analyzed quantitatively using statistical techniques to find whether livability depends on socio-economic and demographic parameters.

## IMPORTANCE OF LIVABILITY IN RESIDENTIAL AREAS

Livability refers to the living conditions of a place and reflects perception of inhabitants about the place to be fit for living or not. Livability is the sum total of all the factors that contributes towards quality of life viz: Built and natural environments; Economic prosperity; Social stability and equity; Educational opportunity; Cultural, entertainment and recreational possibilities (PLC 2001). According to census 2011, GoI, urban population had grown to 377 million from 286 million in 2001. This clearly indicates that India is urbanizing at a higher pace and will witness a huge urban transformation in coming years. The scale and speed of urbanization and high population growth will pose an unprecedented managerial and policy challenge on livability in residential areas. Also, ministry of Housing and Urban Poverty Alleviation had estimated housing shortage at the beginning of 12<sup>th</sup> five year plan in India to be 18.78 million. The implication of this is more housing and infrastructure would be required in coming years adding up to already existing built up mass. Housing along with public facilities and services in residential areas are directly or indirectly responsible for providing livable conditions in residential areas.

Livability being a very subjective notion argues various opinions of how to assess the quality of life because each person has different values on the important aspects of one's life (Carmichael, Gleason, Lehrmitt & Luppino 2007). Though the interpretation of livability varies with time and place but the concept seems to share terms like "quality of life", "well-being" and "life satisfaction" all across (Brook Lyndhurst 2004). In the US, livability refers to overall 'quality of life' and 'well being' whereas in UK, livability focuses strictly on local environment i.e. cleanliness, safety and greenery (Brook Lyndhurst 2004). Wheeler (2001) argues that the most important element in discussions of livability is the subjective experience of living in particular places. The perception of local populace about livability is important in identifying the key attributes of livability which in turn will be useful in assessing the liveability.

A research conducted in Malaysia concluded that understanding of livability needs to be approached from the perspective of local people so that the knowledge of the subjective, human side of livability can shed light on the situation beyond objective indicators (Leby & Hashim, 2010). According to Timmer & Seymoar (2006) livability is defined by 'quality of life' as experienced by the residents within a city or region. "Livability is concerned with the quality of space and the built environment. It is about how easy a place is to use and how safe it feels. It is about creating – and maintaining - a sense of place by creating an environment that is both inviting and enjoyable" (ODPM 2006).

According to Wheeler (2001) liveability can be defined as "the quality of being pleasant, safe, affordable and supportive of human community". Arizona State University (2005) prepared a report on livable communities for American Association of Retired Persons (AARP) public policy institute and defined livability as "A livable community is one that has affordable and appropriate housing, supportive community features and services, and adequate mobility options, which together facilitate personnel independence and the engagement of residents in civic and social life."

In the Indian context, owning a house for lower and middle income group households is a high point in their life which comes about after years of wait and curtailing expenses to save for the "dream home" in a livable residential area. Therefore the residential area must reflect the quality of life that the inhabitants had aspired for and provide the basic utility services and public amenities as per standard norms.

Residential area being a basic building block of a town or city, understanding livability from inhabitant's perspective would enable such knowledge to be used in formulating and implementing urban policies and programme.

## RESEARCH APPROACH

The paper explores the dependency of livability on socio-economic and demographic parameters of residential areas with respect to inhabitant's perception for livability. For this purpose a city had to be selected which can best encompass and be the representative of various factors that affect the expectations and aspirations of the inhabitants. India is a vast country showcasing social and economic diversity among its states and cities. Therefore, a city representing various facets related to culture, religion, caste, creed etc. of Indian society is to be selected to carry out the research work. Further, the idea is to choose a city which not only has lots of potential to grow but that this potential is being harnessed aggressively. It is this phase of evolution which will throw many challenges to City Planners and this transition is the most appropriate moment in the developmental life cycle of a city in order to best understand the opinions of its inhabitants and address these.

The City of Bhopal is therefore chosen as it is the 18th fastest growing city in India and the world's 77th fastest growing urban centre. Bhopal's average annual population growth rate is 2.69 per cent (Census 2011). According to the Government of India's official definition of income groups, Bhopal is predominantly inhabited by middle and lower income group households; Bhopal has nearly 26.7 percent households belonging to MIG and 34.7 percent belonging to LIG, aggregating targeted households for the study to 61.4 percent (Bhopal Municipal Corporation 2005).

A research approach using quantitative statistical methods is adopted in the study. It was found in qualitative research carried out for understanding livability that socio economic and demographic parameters do influence livability. A hypothesis that livability as perceived by inhabitants depends on socio-economic demographic parameters is therefore formulated. For the purpose of this study socio-economic and demographic parameters are identified and selected based on census of India description of socio economic parameters. Livability attributes identified through phenomenographic research method are selected as dependent variables and socio-economic parameters as independent variables. Questionnaire is prepared in two parts; first part includes questions to capture information on all identified socio-economic and demographic parameters of the inhabitants. In the second part of questionnaire a small description of all twenty livability attributes is provided for better understanding of context of each attribute. This would help Inhabitants in assigning appropriate importance rating to each livability attribute as per their contribution in making a place livable. Due to highly subjective and constantly evolving concept of livability, the selection of residential areas for collecting data to record inhabitants perception of livability becomes very important.

The study being at a city level should be representative of prominent residential areas spread across the city. Bhopal city is spatially divided into fourteen zones which are further subdivided into total seventy wards. To find out inhabitant's perception about livability 35 residential areas are selected from all these fourteen Zones. The selected residential areas represent different age periods in timeline of more than 60 years. For the purpose of this study, the residential areas are selected from all the time-periods starting from areas having age of more than 50 years, 40 to 49 years, 30 to 39 years, 20 to 29 years, 10 to 19 years and less than 10 years. The scope of this study is limited to explore perception of livability in Indian context which is best represented by MIG and LIG people. Residential areas mostly inhabited by MIG and LIG households are selected to carry out the study.

The age group of sample of the study comprises of adults within range of 18- 80years of age. Electoral department of government of India keeps record of voter's identity of all the constituencies. In India eligibility to get voting rights is 18 years and people above this age are listed in voter list. For sampling, therefore, it was decided to map the voter lists of all the identified colonies and randomly select samples for survey. Out of the total identified 781 samples only 630

inhabitants responded while remaining 151 inhabitants either declined to participate in survey or were unavailable despite trying to contact them again and again. Data is then analyzed for the dependency of livability attributes on socio-economic demographic parameters. For analysis first an appropriate test was applied for testing hypothesis. Each of the dependent variable was tested for its significance level separately.

## DEPENDENCY OF LIVABILITY ATTRIBUTES ON SOCIO-ECONOMIC AND DEMOGRAPHIC PARAMETERS

The dataset of this study has nine independent socio-economic and demographic variables along with twenty dependent livability attributes. All socio-economic and demographic parameters viz: Gender; Religion; Education; Age; Marital Status; Life cycle; Income; Occupation and Working status are independent variables. These variables describe the characteristic of survey population and help in understanding the influence of socio economic parameters on livability. Dependent variables include livability attributes that are identified and selected through qualitative research approach. The statistical description for twenty livability attributes is illustrated in Table 1 whereas Table 2 describes the statistics of socio-economic and demographic parameters.

Livability attributes are rated by samples according to the importance of individual livability attribute in contributing towards achieving livability of residential areas. The importance assigned may or may not vary depending on all these independent variables. Ratings for some of the livability attributes may be gender biased or ratings could be different for housewife and female who is working. Samples having teenager kids may assign importance to different attributes than samples with small kid or no kid. Old age samples may have assigned more importance to attributes which provides more convenience within the residential areas. Therefore, to ascertain whether there is an association between dependent and independent variables following hypothesis are framed:

**H<sub>0</sub>:** Livability attributes are independent of socio-economic and demographic parameters

**H<sub>1</sub>:** Livability attributes are associated with socio-economic and demographic parameters

**Table 1: Descriptive Statistics of Livability Attributes**

Livability Attributes	Livability Attributes Description	Mean	Std. Deviation	N
a1	Connectivity to city level public amenities	4.98	2.707	630
a2	Locational Attributes	5.71	2.094	630
a3	Quality and availability of public amenities	7.65	1.384	630
a4	Easy Accessibility to Public Amenities	6.46	2.344	630
a5	Community Gathering Places	8.53	1.113	630
a6	Recreation	6.60	1.453	630
a7	Spiritual Considerations	5.34	1.361	630
a8	Quality and availability of public services	8.57	1.118	630
a9	Maintenance of Services	8.58	1.088	630
a10	Safety And Security	9.22	.950	630
a11	Sense of Community	6.84	1.342	630
a12	Social Acceptance of Residential Area	6.24	1.943	630
a13	Well Planned Residential Areas	3.82	1.562	630
a14	Absence of Non- Compatible Activities	3.72	1.549	630
a15	Housing Options	1.97	1.044	630
a16	Housing Density	4.43	1.269	630
a17	Climatological Considerations	3.82	1.503	630
a18	Clean Environment	8.02	1.183	630
a19	Ambience And Visual Character	7.14	1.165	630
a20	Non Existance of Noise	3.21	1.826	630

Chi- square test was conducted to test whether livability attributes are dependent on socio-economic demographic parameters or not. SPSS statistical software was used to apply chi square test on nine independent variables (socio- economic and demographic factors) and twenty dependent variables (livability attributes).

The output of chi-square test indicates that it cannot be used to accept or reject the hypothesis as the data fails assumptions necessary for validity of data. In such situations, a significance level based on the exact distribution of the test statistic should be used to obtain an accurate  $p$  value without relying on assumptions that may not be met by data (Mehta & Patel 2011).

**Table 2: Description of Socio- Economic and Demographic Parameter**

Socio- Economic and Demographic Parameter	Frequency	Percent	
Gender	Male	302	47.9
	Female	328	52.1
Religion	Hindu	505	80.2
	Muslim	118	18.7
	Others	7	1.1
Marital Status	Married	515	81.7
	Unmarried	58	9.2
	Single	57	9.0
Education standard	Up to secondary	22	3.5
	Graduate and above	608	96.5
Life cycle group	No kids	206	32.7
	Small kids	181	28.7
	Teen age kids	160	25.4
	Old couple	83	13.2
Occupation	Employed	462	73.3
	Jobless	40	6.3
	House wife	128	20.3
Working status of couple	Single working	286	45.4
	Both working	254	40.3
	Retired	90	14.3
Age	Young age	286	45.4
	Middle age	254	40.3
	Old age	90	14.3
Income	Low middle income	210	33.3
	High middle income	144	22.9
	Medium middle income	276	43.8

Exact  $p$  value test was then considered for establishing the relationship between dependant and independent variables but the data set was too large to compute exact  $p$  value. Also, data set don't meet the assumptions necessary for the asymptotic method. In such situations Monte-Carlo method which provides an unbiased estimate of the exact  $p$  value without the requirements of the asymptotic method is used.

It was therefore concluded to use Monte Carlo Significance (2-sided) test for ascertaining relationship between livability attributes and socio-economic parameters. Crosstab was used to conduct Monte Carlo Significance (2-sided) test at 95% confidence interval.

**Table 3: Monte Carlo Sig. (2- Sided) Test (Likelihood Ratio at 95% Significance Level)**

LIVABILITY ATTRIBUTES	SOCIO ECONOMIC AND DEMOGRAPHIC PARAMETER								
	Gender	Religion	Education Standard	Age	Marital Status	Life Cycle	Occupation	Income	Working Status
Connectivity to Public Amenities	0.746	0.407	0.318	0	0	0	0	0	0
Locational Attributes	0	0.094	0.113	0	0	0	0	0	0
Availability and Quality of Public Amenities	0.957	0.607	0.134	0.005	0.03	0.432	0	0	0
Easy Accessibility to Public Amenities	0	0.411	0.727	0.005	0.003	0.131	0	0.002	0
Community Gathering Places	0.761	0.024	0.106	0.73	0.652	0.933	0.528	0.606	0.225
Recreation	0.511	0.621	0.599	0.82	0	0	0.243	0	0.734
Spiritual Considerations	0.639	0	0.557	0	0.63	0	0	0	0
Quality and Availability of Services	0.726	0.274	0.375	0.842	0.279	0.586	0.805	0.021	0.069
Maintenance of Services	0.199	0.407	0.627	0.808	0.536	0.805	0.728	0.587	0.817
Safety and Security	0.791	0.351	0.952	0.63	0.532	0.266	0.401	0.31	0.859
Sense of Community	0	0.055	0.475	0	0.1	0	0	0	0
Social Acceptance of Residential Area	0	0	0.563	0.025	0	0.001	0	0	0
Well Planned Residential Areas	0	0.611	0.174	0.979	0.404	0.838	0	0.042	0.707
Absence of Non-Compatible Activities	0	0.441	0.552	0	0.002	0	0	0	0
Housing Options	0	0.148	0.039	0.702	0.389	0.967	0.54	0.622	0.975
Housing Density	0	0.627	0.085	0.088	0.627	0.382	0.155	0.491	0.492
Climatological Considerations	0	0.068	0.483	0.597	0.268	0.853	0	0.055	0.892
Clean Environment	0.861	0.472	0.886	0.952	0.407	0.985	0.672	0.599	0.878
Ambience and Visual Character	0.266	0.255	0.207	0.852	0.354	0.619	0.999	0.394	0.807
Non Existence of Noise	0	0.676	0.891	0	0.004	0	0	0	0

**Source:** Computed from output of Monte Carlo Test

The matrix of likelihood ratio of Monte Carlo Significance (2 sided) test at 95% confidence level for livability attributes and socio-economic parameters are listed in Table 3. Dependent variables (livability attributes) are tabulated in rows and independent variable's (socio-economic parameters) in columns. For socio-economic parameter "gender" the livability attributes like locational attributes, easy accessibility to public amenities, sense of community, social acceptance of residential area, well planned residential areas, absence of non-compatible activities all have likelihood ratio of exact p value less than 0.05, thus rejecting the null hypothesis that there is no relationship between these attributes and gender. Livability attributes like connectivity to public amenities, availability and quality of public amenities, community gathering spaces, recreation, spiritual considerations, quality and availability of services, maintenance of services, safety and security, clean environment, ambience and visual character all have exact p value of more than 0.05 clearly indicating that the perception for these attributes have no relationship with gender thereby accepting the null hypothesis. This result implies that there is similarity in perception of males and females for these livability attributes.

For independent variable "religion" except for community gathering spaces, spiritual considerations and social acceptance of residential area all other livability attributes have likelihood ratio of exact p value more than 0.05. This clearly shows that religion of inhabitants does not influence the perception of livability attributes. For socio economic parameter education standard, the Monte Carlo significance is more than 0.05 for almost all the livability indicators except housing options. This establishes that relationship of education standard and livability attributes is independent of each other i.e. livability attributes cannot be adjudged through education standard of inhabitants. The perception of livability would remain same irrespective of the education level of inhabitants.

Socio-economic parameters like “age”, “marital status” and “lifecycle group” all shows association with some of the livability attributes while no association with majority of livability attributes as highlighted in table 3. This indicates that perception for livability attributes like connectivity to public amenities, locational attributes, availability and quality of public amenities, easy accessibility to public amenities, sense of community, social acceptance of area, absence of non-compatible activities, and non existence of noise, varies with different age groups. Young, middle aged and old inhabitants perception for these attributes differs but for other livability attributes the perception remains same irrespective of their age group. Similarly perception of married, unmarried and single inhabitants for livability attributes like connectivity to public amenities, locational attributes, availability and quality of public amenities, easy accessibility to public amenities, recreation, social acceptance of area, absence of non-compatible activities, and non existence of noise is different but same for the remaining livability attributes. Also, perception of livability of inhabitants having no kids, small kids, teenage kids, and living alone as old couples without children do indicate differences for livability attributes like: connectivity to public amenities, locational attributes, recreation, spiritual considerations, sense of community, social acceptance of area, absence of non-compatible activities, and non existence of noise, but for remaining livability attributes it shows no association.

Socio-economic parameters like “occupation”, “income” and “working status” all shows a significant association with more than half of livability attributes establishing the fact that perception of livability not only varies among different income groups but also changes with their employment status. Livability also depends on working status of parents whether both parents in a family are working or only one parent is working. Livability attributes like connectivity to public amenities, locational attributes, availability and quality of public amenities, easy accessibility to public amenities, spiritual considerations, sense of community, social acceptance of area, , absence of non-compatible activities, and non existence of noise , all are dependent on occupation, income and working status. Perception of livability attributes like recreation, quality and availability of services and well planned residential areas also varies with different income groups. The perception for remaining livability attributes is indifferent to income groups, occupation and working status.

The result of Monte Carlo Significance (2 sided) test clearly indicates that perception of livability attributes is indifferent to socio economic parameters like religion and education standard. Livability means the same to all inhabitants irrespective of their religion. Inhabitants understanding for livability attributes remains same despite of difference in their education level. It doesn't matter whether you are educated till higher secondary or graduate for judging the importance of each livability attribute. Income, occupation, gender and working status are the four socio economic parameter having a significant bearing on perception of livability attributes. Livability is perceived and understood differently by different income groups though perception of some livability attributes remains same across various income groups. Employed, unemployed and retired inhabitants too perceive more than half of the livability attributes differently. Gender too has an important role in the perception of livability as for half of the livability attributes male and females perception differs whereas for other 50% livability attributes both male and female have same thoughts. Age group, life cycle and marital status too are associated with some of the livability attributes but more than half of livability attributes are indifferent to these socio-economic parameters.

## CONCLUSIONS

It was noticed during interaction with group of inhabitants for understanding livability in Indian context that perception of livability varies with socio-economic and demographic parameters. Quantitative methods are used for ascertaining relationship between livability attributes and socio-economic and demographic parameters. Monte-Carlo Significance (2 sided) test results confirm that perception of livability attributes is indifferent to socio economic parameters

like “religion” and “education standard”. Perception of livability remains same irrespective of religion and education level of inhabitants.

The socio-economic and demographic parameters that have significant bearing on perception of livability attributes are “income”, “occupation”, “gender” and “working status”. Livability is perceived and understood differently by different sub-groups of these socio-economic parameters though perception of few livability attributes remains same across various sub-groups. “Age group”, “life cycle” and “marital status” too show some association with some of the livability attributes but more than half of livability attributes are independent to these socio-economic parameters.

## REFERENCES

1. Arizona State University Herberger Center for Design Excellence. (2005). *Livable Communities: An Evaluation Guide*, for AARP public policy institute. AARP 2005, Washington DC 20049, retrieved 15 December 2010 website: [http://assets.aarp.org/rgcenter/il/d18311\\_communities.pdf](http://assets.aarp.org/rgcenter/il/d18311_communities.pdf)
2. Bhopal Municipal Corporation. (2005). *Bhopal City Development Plan*. Jawaharlal Nehru National Urban Renewal Mission, Bhopal. 2005
3. Brook Lyndhurst, *Livability & sustainable development: Bad habits & hard choices*. (2004). Final Report for the UK Office of the Deputy Prime Minister, London, 2004, retrieved 15 September 2010. website: <http://www.communities.gov.uk/documents/corporate/pdf/142424.pdf>
4. Carmichael, A., Gleason, D., Lehrmitt, R., & Luppino, C., *City of Westminster livability index*, Worcester Polytechnic Institute, London, 2007, retrieved 2 July 2010, website: [http://www.wpi.edu/Pubs/E-project/Available/E-project-022207-34352/unrestricted/City\\_of\\_Westminster\\_Livability\\_Index\\_Final\\_Report.pdf](http://www.wpi.edu/Pubs/E-project/Available/E-project-022207-34352/unrestricted/City_of_Westminster_Livability_Index_Final_Report.pdf)
5. Census of India. (2011). *Rural Urban Distribution of Population*, Ministry of Home affairs, New Delhi
6. Leby, J.L. & Hashim, A.H. (1990). Livability Dimensions and Attributes: Their Relative Importance in the Eyes of Neighbourhood Residents, *Journal of Construction in Developing Countries*. 15:1. 67-91
7. Mehta C.R. & Patel N.R. (2011). *IBM SPSS Exact Tests*, IBM Corp., US
8. Office of the Deputy Prime Minister, 2006, *State of the English Cities*.(2006). A research study. vol.1, ODPM Publications. West Yorkshire, 2006,156, retrieved 15 December 2010. Website: [http://www.northamptonshireobservatory.org.uk/docs/doc\\_StateoftheEnglishCitiesVolume1PDF33Mb\\_id1164004.pdf\\_102444240306.pdf](http://www.northamptonshireobservatory.org.uk/docs/doc_StateoftheEnglishCitiesVolume1PDF33Mb_id1164004.pdf_102444240306.pdf)
9. Partners for Livable Communities 2001, “Towards Livable Communities”, Washington D.C.
10. Timmer , V., & Seymoar, N.K. (2006). *The livable city in: United Nations World Urban Forum’06*. , Vancouver Working Group Discussion Paper, p. 02.
11. Wheeler, SM, 2001, *Livable communities: Creating safe and livable neighborhoods, towns and regions in California: Working Paper 2001–2004*. Berkeley: Institute of Urban and Regional Development, University of California, viewed 10 January 2011, <<http://www-iurd.ced.berkeley.edu/pub/WP-2001-04.PDF>