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URBAN FORM AS A TOOL FOR VALIDATING THE QUALITY OF LIFEIN URBAN PRECINCTS

VINODH VIJAYAKUMAR[1]AND SANGEETHA SP [2]

[1]Research Scholor, AarupadaiVeedu Institute of Technology, VMRF, Vinayaka Nagar, Old Mahabalipuram Road, Paiyanoor, Kancheepuram District, Chennai-603104,Tamilnadu, India.

[2]Department of Ciivl Engineering, AarupadaiVeedu Institute of Technology, VMRF, Vinayaka Nagar, Old Mahabalipuram Road, Paiyanoor, Kancheepuram District, Chennai-603104,Tamilnadu, India.

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ABSTRACT

The intent of any planning or urban design exercise is to increase the quality of living conditions of inhabitants alongside providing aesthetically pleasing and effectively serviced neighbourhoods. The Quality of Living in a neighbourhood arises out of the synthesis of a various attributes which influence the living conditions of an individual in a neighboorhood. Certain neighbourhoods seemingly appear more structured and planned than the others. This study attempts to quantify the various aspects of the neighbourhood and built environment that improves the quality of living of the individual. This study also attempts to validate the significance of a planned and organized urban form on its positive impacts on its inhabitants and its contribution to the overall quality of living in the environment.

INTRODUCTION

The global economy has progressively shifted from the primary and rural to the secondary and urban sectors over the past decades. The start of the twentieth century only 13% of the world's population was living in cities and at the end of it one half (47.5%) of its rapidly growing population was urbanized. According to the UN estimates*[8] in the 50 year period between 1975 and 2025 alone, the global level of urbanization would have risen from 37.7% to 61.1% and the total population living in the cities will have risen from 1.58 billion to 5.06 billion at an average

annual urban growth rate over the period of 2.38%. While it is evident that majority of the world population is living in the cities, it is also imperative to identify how they are placed/ how the cities are equipped to house this population. The Quality of Living is being recognized as an important component of sustainability of cities (Rogerson, 1999). Similarly spatial urban form and its relation to the efficiency of the city has been widely deliberated in various international summits. *[5]

QUALITY OF LIVING

There are innumerable facets of the city which affect the quality of living of the people inhabiting the city. Studies include but are not limited to social, economic, political, environmental, financial, spatial and infrastructure have been done to position the cities in the world order. Several global initiatives such as the Healthy Cities by WHO(1986), Sustainable Cities programme of UN-HABITAT/ UNEP, the Millennium Development Goals (MDG) and the UNDP's Human Development Index (HDI) monitor the development of countries focusing mainly on the aspects of healthy life, knowledge and standard of living. These dimensions can be considered reflective of the three factors that define sustainability – social, economic and environment*[6].The parameters contributing the three factors are closely related to one another and attending to one directly or indirectly affects the other two and the sustainability of a city by large. The domain of study for this research will be the built environment which is an outcome of all the factors shaping the city. Urban QoL in general terms may be described as to represent how well human beings needs are met or the extent which individuals or community perceive satisfaction in various domains of urban life (Costanza et al, 2007).

URBAN FORM - THE BUILT ENVIRONMENT OF A CITY

The term 'urban form' can be used simply to describe a city's physical characteristics. At the broad city or regional scale, urban form has been defined as the spatial configuration of fixed elements.*[1] Features of the urban form at this scale would include urban settlement type, such as a market town, central business district or suburbs. However, urban form is closely related to scale and has been described as the 'morphological attributes of an urban at all scales' (William et al., 2000). Characteristics therefore range from a very localized scale, features such as building materials, facades, fenestrations to at a broader scale, housing type, street type and their spatial arrangement or layout.Urban Form encompasses a number of physical features and non-physical characteristics including size, shape, scale, density, land uses, building types, block layout and green space. These are categorized as five broad and inter related elements that make up for urban form. Density, Layout,

Landuse, Transport Infrastructure, Housing/ Building Type.

This study will attempt to understand the urban form at different scales including the individual building, street, urban block, neighbourhood and the city as a whole. The physical elements shall be empirically studied and the non-physical elements (eg density) economic, social and political processes in place which are physically manifested in housing, schools parks and other services and facilities shall be highlighted through this study. Spatial urban systems and infrastructure and the manner in which we regulate the urban growth characteristics will have positive impacts on urban QoL.

THE PREMISE – PONDICHERY

The study area is required to have a well delineated boundary with distinct urban elements marking the identity of the different sectors within the study area for comparison and clarity. The size of Pondicherry was comprehendible and found appropriate for the study in multiple ways.

Pondicherry is the city is located in the Pondicherry district on the southeast coast of India, and is surrounded by the state of Tamil Nadu with which it shares most of its culture and language. Pondicherry Municipality is preparing a proposal towards Smart City Challenge which would include city wide smart urban solutions as well as identification of areas within the city for its implementation. With its rich heritage, culture, spiritual and educational advantages, the scope for redevelopment can be explored in slums, old markets, vacant grounds, old mills, etc. Pondichery has a defined administrative boundary with a strong urban character. To narrow down the study area further for a extensive survey, the boundary of the smart city proposal was found to be appropriate.

Puducherry has a smart city proposal with a vision of transforming into a global tourism destination considering its heritage, spiritual, cultural and educational advantages. The proposal focuses in enhancing the quality of life of the citizens by improving the city's liveability, sustainability and economic development.

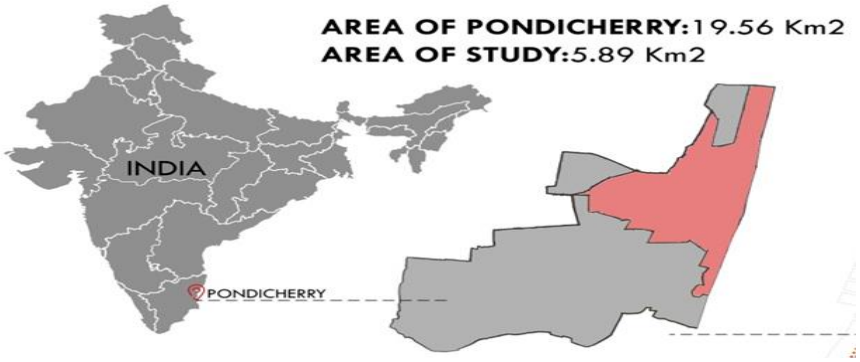


Fig.1

STUDY AREA

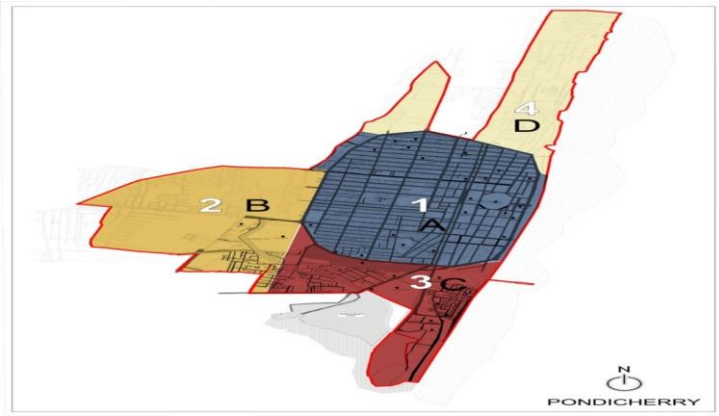
The study examines the links between the urban form and QoL of a delineated urban neighbourhood of Pondicherry which has a conceivable socio political and cultural characteristics. The project area for Pondychery Smart City development is adopted for the study. The 4 zones within the study are have distince urban characteristics and can be considered representative of the entire Pondichery city.

Source : http://pondicherrysmartcity.in/abd-map.php

Fig.2

SITE DELINEATION

The study area is delineated into 4 distinct zones for the questionnaire survey. The zones have distinct identities and perceivable geographical boundaries through urban structure. Out of the 4 zones it is hyposthesised that the urban form of Zone-01 is better organized than the others. The elements of zone -01 which makes it better organized need to be identified and validated as a separate study.



Distinct precincts taken up for the study – Zone 01/ Zone 02/ Zone 03/ Zone 04

Fig.3

CHARACTER STUDY OF PRECINCTS

The Pondicherry was under French rule from 1674 to 1954. This has led Pondicherry to have a unique characteristic bled of French and Tamil cultural influences. The French settlement characterised by yellow buildings, Sri Aurobindo Ashram with its grey austere buildings and the Tamil town displaying diversity and vibrancy. These distinct neighbourhoods coexist and thrive, through an intermingling culture, streetscape and architecture.

ZONE 01

This zone originally had the French settlement and retains the characteristic till date. The area popularly referred to as the White town houses the Consolate of France and the French Institute of Pondichery. This zone is referred to as the White Town. The overall planning of this zone is structured with grid layout of wide streets. Buildings that carry significance at the city level are positioned within this zone. The streets in this zone are tree lined boulevards and pedestrian friendly catering a shaded walkway. Many old Indo French buildings are sensitively subject to adaptive reuse and are now converted to hotels serving the floating tourist population. The Bharathi Park near the Government hospital serves as a vibrant urban space and supports a variety of activities throughout the day. The French buildings are characterised by a particular style of windows, doors and yellow walls. These buildings have window grills projected outwards making more eyes on street and, hence creating a safer neighbourhood. The Shri Aurobindo Ashram and the dormitory building belonging to the ashram are in a grey colour, simple and elegant radiating peace. The functional services such as storm water drain, sewer and electrical lines are concealed underground ensuring the commute safe and aesthetically pleasing.

ZONE 02

This Zone 02 is relatively a new development as compared to Zone 01. This zone dissipates the traffic from the state highway into the Pondichery city. For this reason, there are a few arterial roads which accommodates fast moving traffic in this zone. The bus terminus which acts as the transit node is this neighbourhood. This zone also has the programs serving the tourists in terms of accommodation facilities and commercial restaurants. The urban texture along the secondary roads is fine grained with a predominant residential character. The streets are characterised by open drains and displays a contrasting character to Zone 01.

ZONE 03

Zone 03 is the old Tamilian settlement referred to as the then Black Town while the Zone 01 was the White town. The development was organic and demarcated from the white town by a sewer canal. This Zone has the Railway station but not a very active node as the connectivity to the neighbouring states by trains are less used by people. This zone has the most commercial streets of the town. This zone has both low and middle income group of residential settlements. The middle income settlements being the older settlements and the low income fishermen slum settlements are seen near the sea boundary. Catering to the residential settlements we can see a number of parks, schools and a Stadium as well. This zone also has open drains as an identity all along the streets.

ZONE 04

Zone 04 is again a new settlement along the sea coast. The old buildings on the coast line are reused as government buildings. We can see a strong contradictory character of the old reused buildings and a low income group of fishermen community on either side of the coastal road. The slum settlement is not a planned one and characterised by narrow lanes. This zone is catering more to the native people and we can hardly see any tourists.

METHODOLOGY AND ATTRIBUTES OF STUDY

The set of indicators was formulated based on theoretical studies and interview with stakeholders. The local conditions of four distinct zones with specific characteristics were subject to detailed questionnaire survey. The results of the survey will be subject to a detailed multivariate analysis. A questionnaire encompassing all these attributes to assess the present quality of life was prepared based on different issues and user groups. Well informed enumerators in the subject area were deployed to conduct the survey.

Table 1. Survey of Multivariate analysis

	CATEGORY		INDICATOR
I	Connectivity	**01**	Availability of Inter - Connectivity
		02	Availability of Intra - Connectivity
		03	Availability of Public Transportation
		04	Availability of Choice of Mode of Transportation
		05	Choice of Destinations
		06	Time to Commute to Work is Satisfactory
II	Common Amenities	**07**	Proximity to Public Amenities
		08	Accessibility to Public Amenities
III	Availability and Maintenance of Public Services	**09**	Availability of Undisrupted Electricity
		10	Sufficiency of Water
		11	Collection of Garbage & Waste Disposal
		12	Maintenance of Public Services
IV	Safety and Security	**13**	Safety of Pedestrians
		14	Safety of Commute
		15	Safety of Tourist
V	Sense of Community	**16**	Diversity in Composition of People
		17	Availability of Common Gathering Places
VI	Socio Economic	**18**	Livelihood Opportunities
		19	Availability of Housing Diversity
		20	Social Inclusiveness
VII	Governance	**21**	Access to Service
		22	Effectiveness of Redressal System
VIII	Planning Aspects	**23**	Adequacy of Open Space
		24	Compatibility of Adjacent Land uses
		25	Preservation of Biodiversity
IX	Visual Identity	**26**	Wayfinding through Landmarks
		27	Sense of Place in Precinct
		28	Quality of Architecture
		29	Appreciation of Heritage
		30	Condition of Heritage Structures

RESIDENTIAL STATUS ANALYSIS

Home is necessary for proper health. People of any age fare much better in life when they are active. When we begin to grow older, our bodies and minds begin to lose their youthful levels of fitness and their natural healing abilities. When seniors have access to affordable housing

with supportive services, they are less likely to use the hospital than who don't have access to housing with the same amenities. Residential status of the respondents has been discussed in this section.

Table .2 Residential Status of the Respondents

Details	Classifications	Groups	
		Frequency	Percentage
How long have you been here	less than 10 years	89	22.3
	10-15 years	127	31.8
	15-20years	142	35.5
	Above 20 years	42	10.5
	Total	400	100.0
Nature of ownership	Own house	311	77.8
	Rented	89	22.3
	Total	400	100.0
Type of house	Individual	343	85.8
	Apartment	57	14.2
	Total	400	100.0

Source: Computed by the Researcher

From the above table 2, it can be seen about the status of residence of the respondents in the study area. The old age people want to lead a happy life at their age by residing and spending much time in their homes as it is the time to take rest and to maintain their health with physical and mental activities.

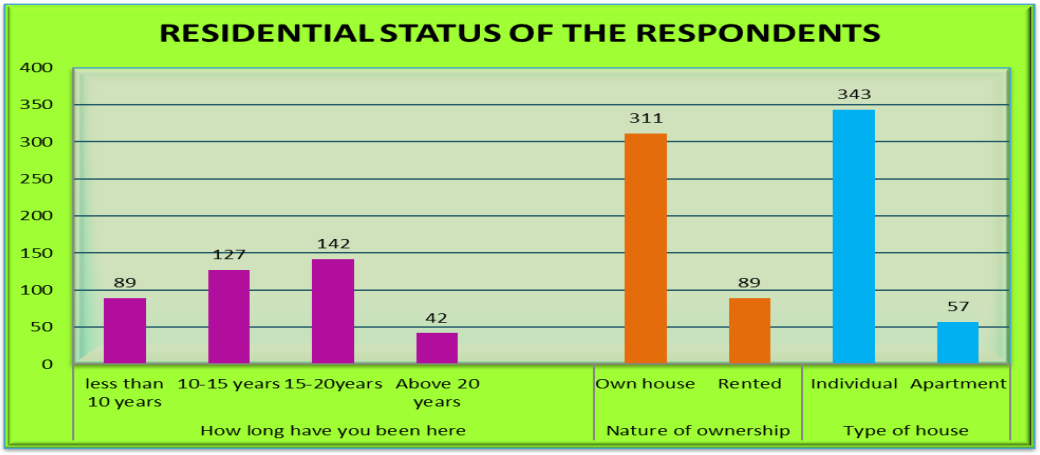
The results are shown as follows, 36% of the respondents are residing in the same residence for more than 15 to 20 years followed by 32% who are dwelling in the same place from 10 to 15 years. 22% of the respondents are having been there for less than 10 years and only 11% are been there for more than 20 years. Hence it is found that more number of respondents in the study area is very long having been there in the same area for more than 10 to 20 years.

The economic status of any individual lies on holding own house and properties which they are gaining through their services and hard work during their younger age. While analysing the nature of ownership of the respondents, it can be found that 78 %, i.e, 311 out of 400 people are residing in their own house. Only 22% are living in the rented house. Hence it is seen that most of the respondents in the study area are dwelling in their own houses.

Houses can be built in large variety of configurations. There are many types of houses have been witnessed in the study area. Some live in big houses and some in small houses and cottages. It can be inferred that out of 400 elderly people in the study area, 343 are living in individual houses. The table shows that 86% of the respondents are residing in

individual houses. Remaining 14 % are living in apartments. Hence it is found that most of the elderly people in the study area are living in individual houses.

Fig. 4 Residential Status of the Respondents



The above figure shows the residential status of the old age people. Since housing is the major requirement for the old age people for their physical and mental health activities, it has been studied and the amenities available inside their houses have also been deliberated which are depicted in the following table 3.

Table 3 Residential Amenities in the House of the Respondents

Sl. No	Residential Amenities		Options			
			Available	Some what	Not available	Total
1	Good ventilation facility	Frequency	315	63	23	400
		Percentage	(78.8)	(15.8)	(5.5)	(100)
2	Natural lighting	Frequency	252	121	27	400
		Percentage	(63.0)	(30.3)	(6.8)	(100)
3	Garden/lawn	Frequency	123	159	118	400
		Percentage	(30.8)	(39.8)	(29.5)	(100)
4	Better sewage facility	Frequency	27	56	317	400
		Percentage	(6.8)	(14)	(79.3)	(100)
5	Domestic water facility	Frequency	312	0	88	400
		Percentage	(78.0)	(0)	(22.0)	(100)
6	Walking place around the house	Frequency	77	104	219	400
		Percentage	(19.3)	(26.0)	(54.8)	(100)

Source : Computed by the Researcher

Figures in the ( ) denote Percentage.

From the above table 3, it can be seen about the housing amenities of the respondents.

Good ventilation facility will enable the elderly people for their

easy breathing and natural air will increase the oxygen level of the people. It is required at their age in their housing because it will improve both physical as well as the mental health of the elderly people. In the study area, 79% of the people are saying that they have good ventilation facility in their houses. 16% are having somewhat ventilation facility and only 6% of the people are living in the house which has no proper ventilation facility. Hence it can be seen that most of the respondents are living in the area where their housing is having good ventilation facility.

Natural lighting is the blessing for any one for their happy and healthy dwelling. Natural lighting facility inside the house will enable the elderly people for their easy access and better movement in their residence. The natural lighting will also enable the health of the old age people with more vitamins. It will give some happiness in their minds. 252 out of 400 nearly 63% of the old age people are living in the houses where natural lighting prevails. 30% are having somewhat natural lighting facility and only 7 % are not having natural lighting in their residences. So it is inferred that most of the old age people are living with natural lighting facilities.

Gardening and maintaining the lawn outside the house will give more relaxation and healthy practice too. In the study area, some plants and trees were found which are maintained by the elderly people around their houses. It is an exercise for them to clean and to maintain the garden. The vegetables, leaves and fruits which they are cultivating in their houses will be utilized by them for their healthy living. It can be seen that 40% are having the garden at somewhat level and not as a proper one. 31% of them are maintaining their garden and lawn in a professional way by planting trees and maintaining them as a hobby and pleasant task in their lives. 30% are not having any garden or lawn for some reasons that lack of land and their disinterest in maintaining the garden in their houses.

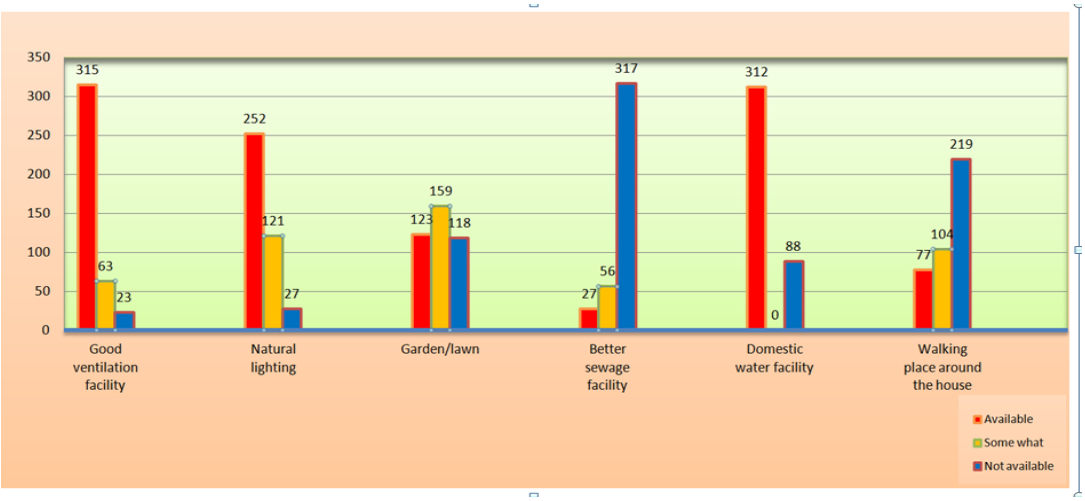
The major amenity in the house is better sewage facility. The effluent of waste water has to be treated properly. Because of the poor maintenance of sewage, there may be scope for diseases. To manage the waste water, proper sewage management has to be maintained by the concerned authorities. In the study area, it has been found that 79% of the respondents have told that they do not have better sewage facility. 14% are having the facility somewhat and remaining 7% are only having the proper sewage facilities which have been constructed by themselves in their apartments. So it is proved that most of the houses in the study area have no better sewage facility.

Water is the major source of energy. Domestic water facility is to be ensured to the elderly people as they could not carry water from elsewhere. In the study area, they have the corporation water tank connections for getting water which can be stored by them in sumps and

other small tanks with them. They have wells and borewells in their houses for domestic water requirements. Being the Delta Region, there is no problem of water scarcity as it is shown in the results as 78% of the people are having better domestic water facility and only 22% have no such domestic water.

Walking is the physical activity especially for the elders to maintain their health. At their age, it is required to have the best place for walking. In the study area, it can be seen that 55% and 26% of the respondents told that they have no separate walking area and somewhat respectively. Only 19% have walking area around their houses. Hence it is found out that there is no proper separate walking place in the study area which has to be assessed.

Fig. 5 Residential Amenities



TYPE OF HOUSE AND BUILDING AMENITIES

In the study area, the respondents are living in both individual houses and in apartments. Whether the amenities will differ in different types of buildings in the study area has been analysed in order to know the mindset of the old age people living in the different types of houses. This psychological approach will give the result about the people living in individual houses and apartments as well.

H0: There is no significant difference between individual houses and apartments with regard to inbuilt amenities.

TABLE 6. Independent T test on Individual Houses and Apartments

Details	Type of House	N	Mean	Std. Deviation	Std. Error Mean
Good Ventilation facility	Individual	343	1.2770	.56374	.03044
	Apartment	57	1.2105	.49051	.06497
Natural Lighting	Individual	343	1.4402	.61778	.03336
	Apartment	57	1.4211	.62528	.08282
Garden/ Lawn	Individual	343	1.9942	.77231	.04170
	Apartment	57	1.9474	.81111	.10743
Better Sewage facility	Individual	343	2.7230	.58412	.03154
	Apartment	57	2.7368	.55183	.07309
Domestic water facility	Individual	343	1.4373	.82788	.04470
	Apartment	57	1.4561	.84664	.11214
Walking place around the house	Individual	343	2.3732	.77654	.04193
	Apartment	57	2.2456	.82982	.10991

Source : Computed by the Researcher

TABLE 7.Independent Sample T test (Levene's Test for Equality of Variances)

Details		F	Sig.	T	Df	Mean Difference
Good Ventilation facility	Equal variances assumed	12.377	0.000**	-2.223	398	-.14730
	Equal variances not assumed			-2.012	125.148	-.14730
Natural Lighting	Equal variances assumed	3.579	0.049*	-.401	398	-.02981
	Equal variances not assumed			-.369	127.776	-.02981
Garden/ Lawn	Equal variances assumed	2.855	0.092	1.221	398	.11399
	Equal variances not assumed			1.182	135.981	.11399
Better Sewage facility	Equal variances assumed	.272	0.602	.109	398	.00759
	Equal variances not assumed			.104	132.844	.00759
Domestic water facility	Equal variances assumed	.115	0.735	.168	398	.01676
	Equal variances not assumed			.169	143.398	.01676
Walking place around the house	Equal variances assumed	.317	0.574	.091	398	.00860
	Equal variances not assumed			.092	145.202	.00860

From the above tables 6 and 7, it can be analysed about the types of houses and the amenities in the built areas. The mean values and standard deviations have also been shown. While analysing the p value, it has been found out that the null hypothesis is rejected at 5 % level for the amenities such as good ventilation facility and natural lighting as the p value is less than 0.05. So it can be said that there is significant difference between types of houses an building amenities with regard to ventilation and lighting facilities.

For the other amenities such as Garden, better sewage facility, domestic water facility and walking place around the house, the p value is more than 0.00 and so the null hypothesis is accepted at 5% level and it is proved that there is no significant difference between types of houses and the above said building amenities.

It is found that both apartments and individual houses are having the same in built amenities in the study area except with the differences in good ventilation and natural lighting facilities.

OWNERSHIP AND TYPE OF AMENITIES

The old age people are in living in own as well as in the rented houses in the study area. In order to know the difference between the owned and rented house and their basic amenities, independent sample t test has been applied.

H0: There is no sig. difference between ownership and types of amenities

Table8. Independent T test on Ownership and Types of Amenities

Details	Type of House	N	Mean	Std. Deviation	Std. Error Mean
Good Ventilation facility	Own house	311	1.2347	.52629	.02984
	Rented	89	1.3820	.63076	.06686
Natural Lighting	Own house	311	1.4309	.59640	.03382
	Rented	89	1.4607	.69177	.07333
Garden/ Lawn	Own house	311	2.0129	.76611	.04344
	Rented	89	1.8989	.81247	.08612
Better Sewage facility	Own house	311	2.7267	.56730	.03217
	Rented	89	2.7191	.62138	.06587
Domestic water facility	Own house	311	1.4437	.83234	.04720
	Rented	89	1.4270	.82418	.08736
Walking place around the house	Own house	311	2.3569	.78982	.04479
	Rented	89	2.3483	.77020	.08164

Table 9- Levenes Test of Equality for Ownership and Amenities

Details		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Good ventilation facility	Equal variances assumed	12.377	.000	-2.223	398	.027	-.14730	.06625
	Equal variances not assumed			-2.012	125.148	.046	-.14730	.07322
Natural lighting	Equal variances assumed	3.579	.059	-.401	398	.689	-.02981	.07438
	Equal variances not assumed			-.369	127.776	.713	-.02981	.08075
Garden/ Lawn	Equal variances assumed	2.855	.092	1.221	398	.223	.11399	.09336
	Equal variances not assumed			1.182	135.981	.239	.11399	.09646
Better Sewage facility	Equal variances assumed	.272	.602	.109	398	.913	.00759	.06969
	Equal variances not assumed			.104	132.844	.918	.00759	.07330
Domestic water Facility	Equal variances assumed	.115	.735	.168	398	.867	.01676	.09984
	Equal variances not assumed			.169	143.398	.866	.01676	.09930
Walking place around the house	Equal variances assumed	.317	.574	.091	398	.927	.00860	.09443
	Equal variances not assumed			.092	145.202	.927	.00860	.09312

The dream of every individual is to own a home in their name for their livelihood. The people residing in own houses will be free from the mental search of homes of their own. Whereas people may live in the rented houses due to some other reasons.

From the above tables 8 and 9, it can be analysed about the ownership of houses and the amenities in the built areas. The mean values and standard deviations have also been shown. While analysing the p value, it has been found out that the null hypothesis is accepted because the p value is more than 0.05 for all the variables. Hence it is proved that there is no significant difference between ownership and types of amenities.

Hence it can be found that in the study area people living in both own and rented houses have same inbuilt building amenities and we could not find any differences among them with regard to the amenities in their houses.

CONCLUSION

This study is an empirical research to evaluate the spatial factors determining the well being. The outcome of the study helps one to understand the spatial urban form and its relation to the efficiency of the city. The study is significant since there are very sparce empirical data in the Indian context relating to well being and quality of living and its relationship to urban form. The outcome of this study will stand as reference to evaluate the QOL of an existing precinct in a city and propose changes at the urban level to alleviate the same. The outcome of the study will stand as a direct design reference to build new neighbourhood and townships.

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