

## Quality of life and habitability of Katwa town, West Bengal: An analysis of residential satisfaction

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**Abstract:** The study aims to understand the quality of life and habitability of the town Katwa of East Bardhaman district in West Bengal, India. The main thrust for this is given to the residential satisfaction index which has been calculated on the basis of scores given by the respondents on ten variables under three aspects - public service (PS), social environment (SE), and dwelling unit support services (DuS). A total of 200 households were surveyed and the analysis of data reveals that citizens are more satisfied with dwelling support services i.e., garbage collection, water supply, and electricity. They are not satisfied with the accessibility of recreation facilities, health services, and sewerage and drainage conditions. Education facilities are not also reaching a satisfactory level. Municipal ward-wise data analysis and mapping help to identify the ward which has a lack of services provided by the municipality. The Center of the town i.e., wards no 5,6 and 17 have better serviceability in terms of PS, SE, and DuS while the periphery wards show a low satisfaction index. These findings may help the local administrator to take proper planning so that peripheral areas will be developed in near future.

**Keywords:** Census town, habitability index, municipality wards, public service index etc.

### Introduction:

The concept of Quality of Life has become popular since 1960s as an instrument to measure the impact of developmental policies (Beukes, 1977). Quality of life is a broader concept having two dimension- objective and subjective. Objective dimension represents external condition of life while subjective dimension refers to the individual's appraisal to that objective condition of life. In other wards it is the measurement of cognitive and affective reaction to his or her life i.e., the satisfaction (Das, D.2007). In objective dimension respondents are asked to report their living condition according to some given measures instead of asking to evaluate whether their living condition is good or bad (Matikka, 2001). On the other hand, subjective dimension tries to assess the satisfaction of people with their living condition. Residential satisfaction, the subjective dimension of quality of life is the perception of feelings and consciousness of one's place of residence (Cutter, 2013). It has been used to predict individual's perception about quality of life (Campbell, Converse and Rodgers, 1976). The term 'residential satisfaction' was first introduced by Fried and Gleicher in 1961 in the context of living in an urban slum. Lu (1999) stated that residential satisfaction is a complex construct, affected by variety of environmental and socio-demographic variables. It depends on the relation between a household's needs, aspirations and current housing conditions (Barcus, 2004; Jiang, Feng, Timmermans, and Li, 2017). It has positive correlation with dwelling structure, the social environment support services and public facilities (Mohit, Ibrahim and Rashid, 2010). The concept of residential satisfaction has multidisciplinary application. It is used to assess individual's perception of the residential environment in the field of environmental psychology (Francescato et al, 1979; Michelson, 1977). It is used to assess quality of housing, neighborhood condition in community development, regional planning and demography by the civil engineers to evaluate the success of dwelling units.

Objectives: Quality of life of an urban area as well as how far the area will be habitable in near future will be depends on number of factors. This paper intends to analyses those factors and their role in residential satisfaction process. The following objectives have been set for the study-

- To assess the level of satisfaction perceived by the residents on public service facilities, dwelling unit support services as well as social services.
- To find out the key factors whose improvement will enhance the overall satisfaction as well as the quality of life.
- To examine ward wise satisfaction index this may help the administrator in proper planning.

Research Questions: Based on the objectives, the research questions of this study are as follows-

- What is the level of satisfaction perceived by the people about public services, social environment and dwelling unit support services?
- How much overall residential satisfaction depends on the quality of public facilities?
- How much level of satisfaction depends on social environment?
- How much level of satisfaction depends on dwelling unit support services?
- i. Which factors enhance the habitability of the town in near future?

### Study Area:

Katwa is agriculture based semi-urban center of Katwa sub –division. It is situated in the confluence point of river Ajay and Bhagirathi. It is located in between 23 °37' N to 23 °39' N latitude and 88 °6' E to 88 °8' E longitude. The Katwa Municipality was established in the year 1869 with a total area of only 1 sq. km and 5000 population. Today Katwa Municipality consists of 20 wards covering an area of 9.58 sq. kms. According to 2011 Census, 81615 population reside in the town. Katwa is also district Sub-Division of PurbaBardhaman district and for that it constitutes many of administrative setup on this town. The town has reasonably good accessible having SH-21 and Eastern railways which extend from Sealdah to Katwa and Howrah to Katwa. The Katwa railway station is well connected by eastern railway both by main and chord line covering Kalna and Katwa road with hinterland. It lies at distance of about 56 Km from Burdwan city, 52 km from Nabawip, 10 Km from Dainhat, 68 Km from Beharampur city, 78 km from Krishnanagar and 60 km from Bolpur. City of Kolkata is only 158 km away from Katwa.

### Methodology:

Sampling and Data Collection: Individual household survey through semi-structured questionnaire has been employed to collect the data of present study. A total 200 samples; 10 from each 20 wards were selected randomly. The semi-structured questionnaire includes questions related to socio-economic, socio-demographic profile of respondents as well as questions on public services, social environment and dwelling support services i.e., questions related to residential satisfaction.

### Analytical Approaches:

Residential satisfaction is multidimensional as so many factors can affect residential satisfaction. According to Mohit et. al. residential satisfaction has low affirmative relationship with neighborhood facilities while it is highly correlated with public services, social environment and dwelling structures. Hur and Morrow Jones gave emphasis on recreational facilities and public services to assess residential satisfaction. Kinship and friendship have also positive association with residential satisfaction (Tao, Amerigo M, AragonesJI, Aulia DN, Ismail AM).

Socio-economic and socio-demographic factors are also affirmatively related with residential satisfaction. Age, household size, employment types, length of residence influences residential satisfaction (Mohit et al, Tao et al, Zanudana et al.). Length of stay has both positive (Fang, Y) and negative (Dekker et al) effect on residential satisfaction. According to Dekker et al elder member of the family become sometimes less satisfied due to their health condition but economic condition of the family have affirmative relation with residential satisfaction. Contrary to that Hur and Morrow Jones found that income, educational level, marital status and race have no influence on residential satisfaction. Based on the above discussion three aspects of residential satisfaction has been chosen for present study; Public Service (PS), Social Environment (SE) and Dwelling unit support services (DuS). Three variables- public transport services,

educational facilities and health services has been taken for Public Services while security from social crime, market facilities and access to recreation are assessed for social environment. Water supply, electricity supply, garbage collection and sewerage system- these four factors has been analyzed for dwelling support services.

All these variables have been assessed using 6-point Likart scale where 0 denotes very dissatisfied and 4 denotes very satisfied as well as 5 denotes unknown. Satisfaction index of each aspect has been derived by using techniques employed by Mohit et al.

$$SIc = \frac{\sum_{j=1}^N yj}{\sum_{j=1}^N Yj} * 100$$

Where, SIc = satisfaction value of component c

N= number of variables of the components

y= score given by the household on jth variable under the component

Y= maximum possible score on the jth variable

The overall residential satisfaction index has been analyzed by using following formula

$$RSI = \frac{\sum_{j=1}^{N1} ps + \sum_{j=1}^{N2} se + \sum_{j=1}^{N3} dus}{\sum_{j=1}^{N1} PS + \sum_{j=1}^{N2} SE + \sum_{j=1}^{N3} Dus} * 100$$

RSI = Overall residential satisfaction index score of a respondent, ps se and dus represent the actual index score of an individual on the jth variables; PSj, SEj and DuSj represent the maximum possible score for the jth variables.

At last, on the basis of different calculated index value a development index has been produced for residential satisfaction by using the equation of HDI mentioned by UNDP (1990),

$$HDI = \frac{\text{Average Value} - \text{Minimum Value}}{\text{Maximum Value} - \text{Minimum value}}$$

**Result and Discussion:**

Socio-economic characteristics of the respondents: Table I shows that respondents mean age is 43, ranges between 15 to 87 age. Among the respondents 66.5% is male while 33.5% is female. In respect of religious background most of them are Hindu (91%) and are of general caste background (65%). In the surveyed household most of the family have 4-5 members while the earning member is generally single.

**Table-1 Respondent’s demographic and socio-economic characteristics**

Variables		Observations	Percentage	Mean	Standard Deviation
Age		200		42.76	14.025
Gender	Male	133	66.5	0.34	0.477
	Female	67	33.5		
Religion	Hindu	182	91	0.91	0.28
	Muslim	18	9		
Caste	General	130	65	1.79	1.244
	OBC-A	17	8.5		
	OBC-B	18	9		
	SC	30	15		
	ST	5	2.5		
Family Member		200		4.64	2.181
Earning Member		200		1.55	0.775
Educational level	Illiterate	6	3	3.83	1.721
	Primary	18	9		
	Upper primary	20	10		

	10th pass	36	18		
	10+2 pass	44	22		
	UG	42	21		
	PG	24	12		
	Others	10	5		
House type	Kachha	5	2.5		
	Pucca	188	94		
	Semi-pucca	7	3.5	0.96	0.253

Source: Primary Survey, 2022.

### Residential Satisfaction Score:

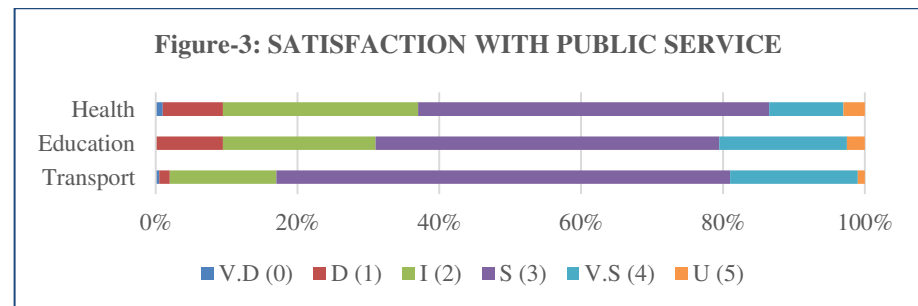
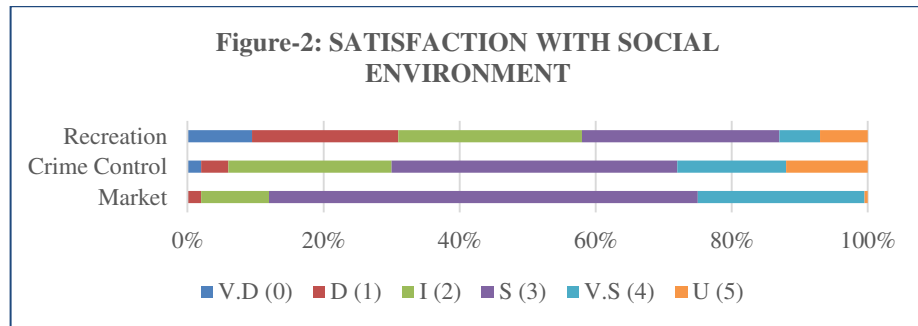
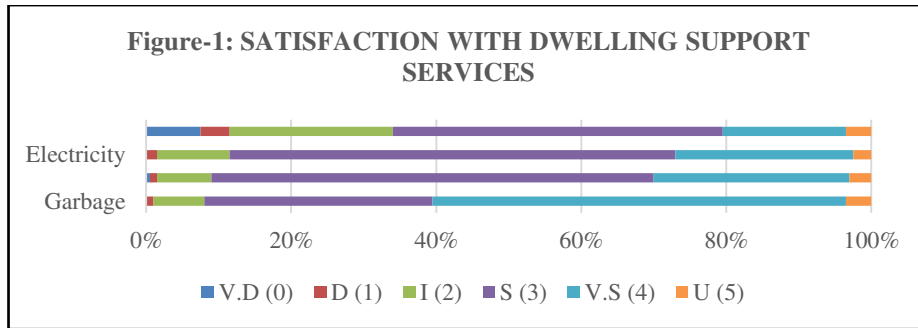
All the ten variables are ranked based on respondent's perception score. The result (Table-2) disclose that garbage collection has ranked 1<sup>st</sup> position with 710 score, consequently with water supply, electricity supply, market and security from social crime with 2<sup>nd</sup>, 3<sup>rd</sup> 4<sup>th</sup> and 5<sup>th</sup> position. Access to recreation has scored 10<sup>th</sup> position, following public transport (6<sup>th</sup>), education facilities (7<sup>th</sup>), sewerage and drainage (8<sup>th</sup>) and health service (9<sup>th</sup>).

Field observation also support this analysis as the Katwa municipality manage garbage and solid waste very efficiently on regular basis and respondents are too much satisfied with the process of collection of garbage of municipality. They are least satisfied on recreational facilities as they have very less access to park, garden etc. Respondent are also very dissatisfied on sewerage and drainage condition. Unplanned housing development in low lying areas of Ajay-Bhagirathi flood plain is the main reason for this inspite of well management garbage collection. The qualitative analysis also supports this scoring which has been represented by fig:1-3. Fig-4 shows that people are more satisfied with dwelling support services (79.13) than the public services (70.89) and social environment (69.42).

**Table-2 Residential satisfaction score**

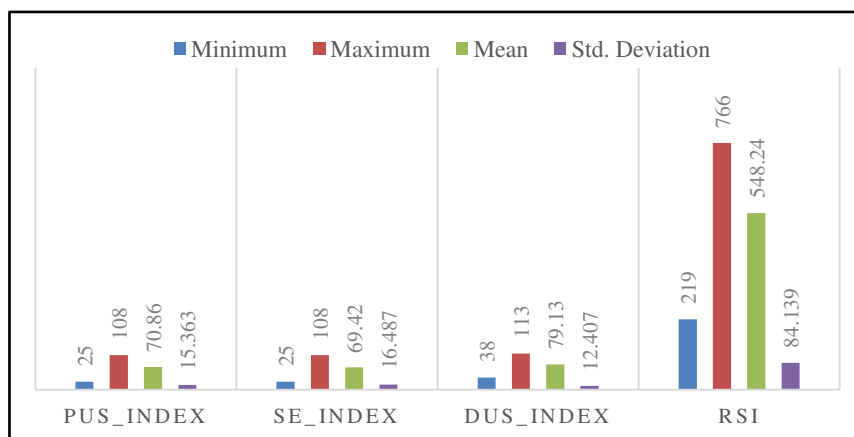
Rank	Satisfaction with	V.D (0)	D (1)	I (2)	S (3)	V.S (4)	U (5)	Total score
1st	Garbage Collection	0	1	7	31.5	57	3.5	710
2nd	Water Supply	0.5	1	7.5	61	27	3	644
3rd	Electricity Supply	0	1.5	10	61.5	24.5	2.5	633
4th	Market	0	2	10	63	24.5	0.5	619
5th	Crime Control	2	4	24	42	16	12	604
6th	Public Transport	0.5	1.5	15	64	18	1	598
7th	Education Facilities	0	9.5	21.5	48.5	18	2.5	564
8th	Sewerage & Drainage	7.5	4	22.5	45.5	17	3.5	542
9th	Health	1	8.5	27.5	49.5	10.5	3	538
10th	Recreation	9.5	21.5	27	29	6	7	443

Source: Field Survey, 2022



The Pearson Correlation Test and Habitability Index: Pearson's correlation between residential satisfaction index and different variables shows that residential satisfaction index is highly positively correlated with public services than social environment and dwelling support services. Education (0.63), health (0.56), sewerage (0.55), recreation (0.54) and transport (0.51) are firmly correlated with residential satisfaction while garbage collection (0.23) has very weak correlation and water supply (0.39), market (0.40), electricity (0.41) as well as security from crime (0.46) are moderately correlated with overall residential satisfaction.

Figure-4



$HIx = \frac{\sum_{i=1}^N ay'x}{\sum_{i=1}^N Ay'x} * 100$  Where, HI is the Habitability index (Ogu, 2002) of variable x, ay'x is the actual score given by the respondents and Ay'x is the maximum possible score that the respondent y could give.

In terms of habitation Katwa town is suitable as habitability index shows high values in almost all variables except recreation facilities (55.37), sewerage system (67.75) and health facilities (67.25). Respondents are too much satisfied with the garbage collection system which is reflected in habitability index (88.75) in sequence with water supply (80.5) and electricity supply (79.12).

**Table-3: Habitability Index**

Variable	Unit of Measurement	Observation	Mean	S.D	Minimum	Maximum	Pearson (r)	Habitability Index
Relation with neighbour	Likart Scale	200	2.8	0.445	1	3	0.034	
Transport	Likart Scale	200	3.01	0.691	0	5	.505**	75.125
Health	Likart Scale	200	2.69	0.915	0	5	.562**	67.25
Education	Likart Scale	200	2.84	0.912	1	5	.629**	70.875
PS index			70.86	15.363	25	108	.812**	
Recreation	Likart Scale	200	2.22	1.31	0	5	.541**	55.375
Market	Likart Scale	200	3.11	0.656	1	5	.396**	77.75
Crime	Likart Scale	200	3.02	1.107	0	5	.464**	75.5
SE Index			69.42	16.487	25	108	.765**	
Electricity	Likart Scale	200	3.16	0.693	1	5	.411**	79.125
Water	Likart Scale	200	3.22	0.71	0	5	.393**	80.5
Garbage collection	Likart Scale	200	3.55	0.721	1	5	.235**	88.75
Sewerage	Likart Scale	200	2.71	1.137	0	5	.556**	67.75
DuS Index			79.13	12.407	38	113	.687**	
RsI			548.24	84.139	219	766	1	

Source: Field Survey, 2022.

### Public Service Index

Public service Indicator refers to the availability of basic state services or amenities which serve the people. On the other hand, it may include the provision of essential services, such as, health, education, water and sanitation, transport infrastructure, electricity and power and internet and connectivity. India also holds the 49<sup>th</sup> rank among 179 countries in world and 7.6 is the value of Public Service Index (Fund for Peace, 2022).

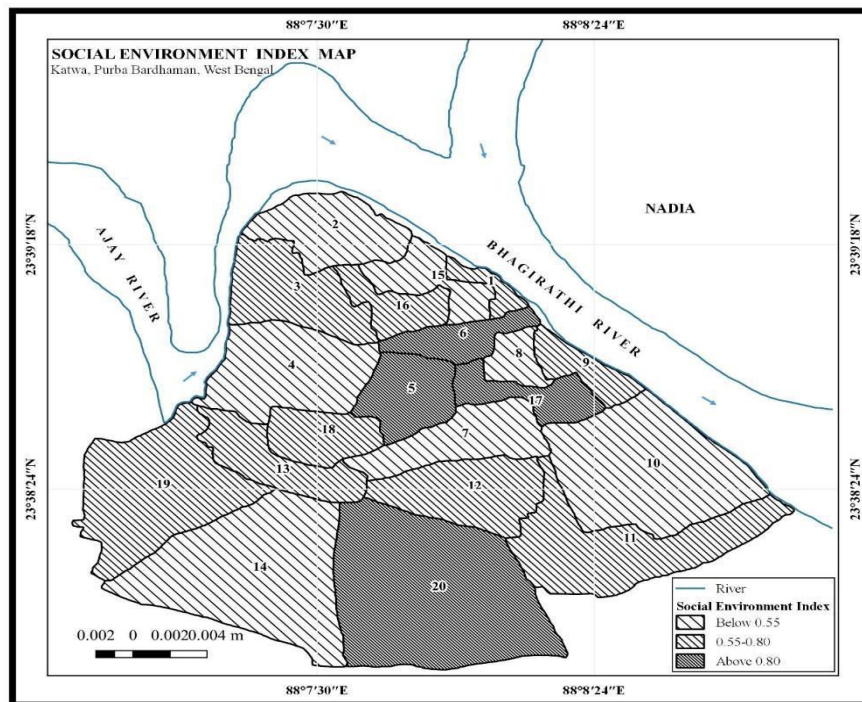
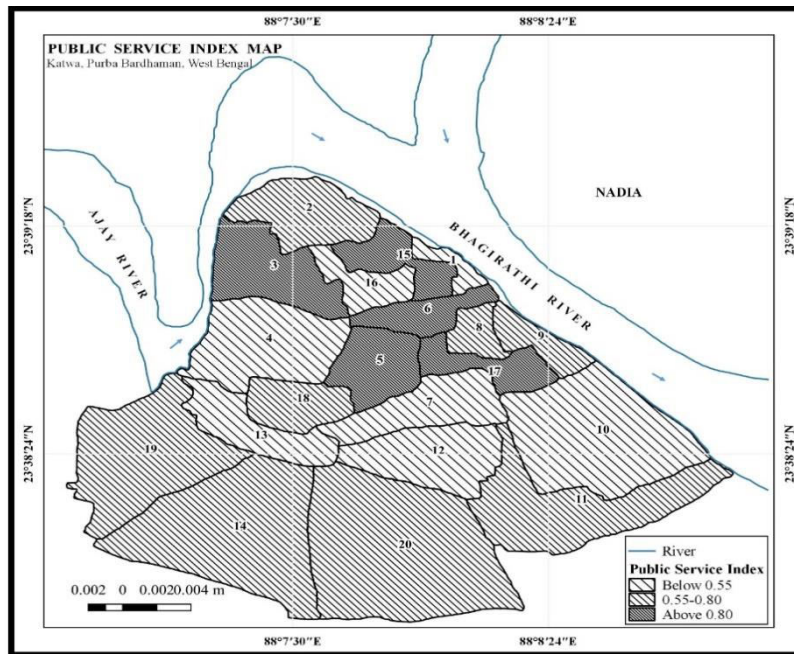
For our study purpose, we select the major three elements, such as transport, education, and health to determine the Public Service Index. The Public Service Development Index signifies that the development rate is very high in the 3, 5, 6, 15, 17 municipality wards (Table-4). The location of Katwa College, lots of reputed schools, and private institutions enriched the quality of education. Katwa Sub Divisional Hospital, Municipality Hospitals, and private clinics provide better health facilities among these wards. 40% (Table-4) of the Municipality wards are in moderately developed index zones. Only 35% of Municipality Wards (Table-4), a total 7 number of wards have a low development state. Well-connected Katwa bus stand, ferry connectivity and Katwa Railway junction station increase the accessibility and connectivity with surrounding district of Nadia, Murshidabad, Howrah, Birbhum etc.

### Social Environment Index

Human Social Environment encompasses the immediate physical surroundings, social relationships, and cultural milieus within which defined groups of people function and interact. The social environment includes built



infrastructure, industrial and occupational structure, labor markets, social and economic processes, wealth, social, human, and health services, power relations, government, race relations, social inequality, cultural practices, and beliefs about place and community (National Institutes of Health; 2000).

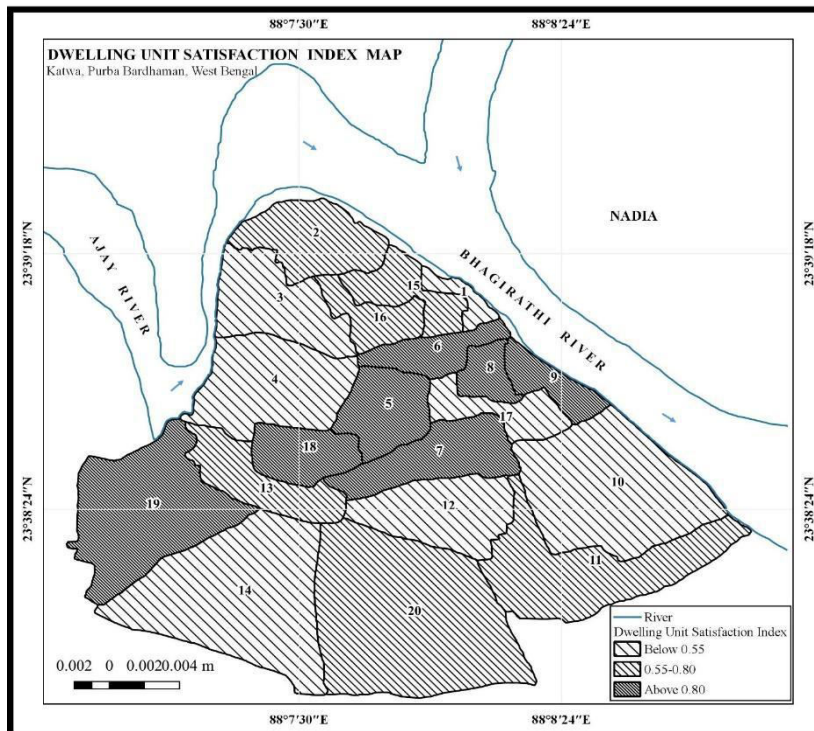


To complete ward wise social environment index in Katwa municipality town, selected major three components such as recreation, market, and crime among the lots. Ward number 5,6,17 and 20 (Table-4) has the maximum value of the social environment index ranging from 0.70 to 0.79. Ward no. 1, 3, 9,11,12,13,16,18,19 subsumes moderate human development. The remaining 7 wards out of 20 are located below 0.55 index value (Table-4) which indicates low social environmental progress. 5, 7, 12, 13, and 18 wards are the heart of this municipality (Field Survey, 2022). Most of the markets such as *Khorer Bazar*, *Chaul Patti*, *Nichu Bazar*, *Bora Bazar*, *Sakhari Patti*, etc. are located here. Uneven distribution is also noticed in case of Crime Control and recreation. 42% respondents are satisfied with crime control measures (Table- 2).

**Dwelling Unit Satisfaction Index**

Settlement and people's minimum living space are an integral part of dwelling units, which are created over the earth's surface by human beings to protect privacy and a better way of life. The site, situation, and function are the basic elements of the upgradation and development of any dwelling unit. Katwa municipality has a total 19382 number of households with a total population of 81615 (Census of India, 2011).█

The Dwelling unit satisfaction index was calculated on the selected factors of electricity, water, sewerage, and garbage collection. Garbage collection and waste management are much renowned throughout the municipality, and 57% (Table-2) respondents also support it strongly. Sewerage is not very good in most of the municipality wards; nearly about 40% (Table-2) of the total wards are located in very weak condition. Poor Sewage causes frequent inundation and it is also severe with a heavy downpour. 30% of municipality wards (Table-4) are located in moderately developed categories. Only Seven municipality wards (5, 6, 7, 8, 9, 18, and 19) have the greater facilities for electricity, sewerage, water supply, and garbage collection.



Local municipality authorities expend huge amounts of money and try to improve such conditions. In the financial year of 2013-2014 106.04 (6.89%) lakh, 114.38 (7.43%) lakh and 125.06 (8.12%) lakh are shared to achieve better facilities of electricity, lightning, water supply, and drainage.



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**Table-4 Rate of Development**

Aspect	Public Service Index			Social Environment Index			Dwelling Unit Satisfaction Index		
No. of Wards	3,5,6,15,17	2,8,9,11,14,18,19,20	1,4,7,10,12,13,16	5,6,17,20	1,3,9,11,12,13,16,18,19	2,4,7,8,10,14,15	5,6,7,8,9,18,19	2,11,13,15,16,20	1,3,4,10,12,14,17
Total No. of Wards	5	8	7	4	9	7	7	6	7
% of Municipality Wards	25	40	35	20	45	35	35	30	35
Zone of Development	High (Above 0.80)	Moderate (0.55-0.80)	Low (Below 0.55)	High (Above 0.80)	Moderate (0.55-0.80)	Low (Below 0.55)	High (Above 0.80)	Moderate (0.55-0.80)	Low (Below 0.55)

Source: Field Survey,2022.

#### **Conclusion:**

This study focused on the habitability of Katwa town with relation to quality of life. It is also present that residential satisfaction and the quality of life are positively related. Residents' perception on the basis of the level of different amenities make an overall disparity throughout the municipality wards in Katwa town. Today amenities are considered to be one of the most important factors in assessing residential environment (OECD, 2011). Collaboration of people with local governments and different NGO's will be overcome the inter ward disparities in quality of life and the index of habitability entire the Katwa municipality. It will be enriched quality of life and make socio-cultural environment more habitable, peaceful and enjoyable.

1. Funding – Not Applicable
2. Ethical Approval –No human participation was involved in the entire research.
3. Informed Consent – The research was carried out through field survey on questionnaire method and during the survey consent was taken from all responders.
4. Author's Contribution – conceptualization, formal analysis, methodology- Madhumita Sen.

Data curation, investigation & writing – Madhumita Sen, Toton Ghosh

## Map making- Toton Ghosh

5. Conflict of Interest - We have no affiliations with or involvement in any organization with financial interest and non-financial interest in the subject matter discussed in this manuscript. We certify that the submission is original work.
6. Data availability statement – Data were collected through field study & it will be available on request from 1<sup>st</sup> author.
7. Acknowledgement – Not applicable

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