Journal of Information Systems Engineering and Management
2025, 10(55s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

Socio-economic Status of slum people of the municipalities of Purba Medinipur, West Bengal.

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ARTICLE INFO

Received: 24 Dec 2024

Revised: 12 Feb 2025

Accepted: 26 Feb 2025

ABSTRACT

The growth and development of slums in the urban area is one of the important issues for the urban local bodies (ULB's). Almost one billion people live in slums worldwide, which is more typically overcrowded, polluted, and lack of basic amenities. The work attempts to assess the Socio-economic Status both qualitatively and quantitatively. Primary and secondary data were used to fulfill the objectives. The collected data have been analyzed and GIS techniques have been used for cartographic presentation. The study is concentrated on all slum pockets among the municipalities of Purba Medinipur (Haldia, Egra, Contai Panskura and Tamralipta(Tamluk) of West Bengal. The Weightage value, composite index, standard deviation and 3-point Likert scale have been used to determine the Socioeconomic status of slum dwellers. This study used firstly variables under 3 major dimensions as Demographic profile, Economic Status and Housing and Amenities. Secondly, 9 variables such as Family Size(X1), Education level(X2), Occupational pattern(X3), Monthly income(X4), Types of House(X5), Average no. of room(X6), Road types(X7), Drinking water (X8), and Sanitation(X9) have been chosen to find out the developmental Status of the municipalities in terms of their present pattern. Owing to bad hygienic conditions and the Economic Status of the slums of the municipalities of Purba Medinipur, they are not satisfactory. According to the findings of the primary survey, the majority of Slum Households in Egra municipality are Lacking in Housing Conditions, Infrastructure and Amenities. Slums socioeconomic Status is good in Pankura and Tamralipta (Tamluk) Municipality among the five Municipalities of Purba Medinipur. Finally, some suggestions were given for inclusive development and improving slums socio-economic status.

Keywords: Urbanization, slum dwellers, Socio-economic Status, development

1. INTRODUCTION:

The word 'Slum' means a densely or heavily populated area in the city (Hossain, S. 2013). Slum is a most critical part of the cities; most slum dwellers belong to in or near poverty (Stokes, C. J. 1962). In the early age of industrial revaluation, slums were formed near the factories' gates, which were not so far from the centre of the cities. However, nowadays, most of the slums are growing up at the centre of the cities (Kumar, P. 2010). Slum dwellers belong to or near the poverty line with illiteracy and worse health status; they are low earners. They are deprived of proper formal education facilities as well as job facilities. For this reason, slum dwellers are involved in informal labour, which inhibits them from earning more. They work in harmful environments, which forces them to work in informal sectors (Tiwari, N., & Singh, M. K. 2021; Joshi, S. 2005; and Alamgir, M. S. et al. 2009). Lower socio-economic Status leads them to an ailing life. Due to lower socio-economic status, the living conditions of slum dwellers are very poor compared to those of rural dwellers. They are most affected by communicable diseases, and also, they have to face malnutrition (Ameratunga, S. et. al. 2006; Kamruzzaman, M., & Hakim, M. A. 2015). In developing countries, most of them are living below the poverty line. They do not achieve a good source of income. There is inadequate safe

Journal of Information Systems Engineering and Management
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e-ISSN: 2468-4376
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drinking water, the basic human need (Ompad, D. C. et. al. 2007; Kamruzzaman, M., & Hakim, M. A. (2016). Unfortunately, most of the slums suffer from lack of safe water. Although public water supply is available in some slum areas, but the quality of water is not satisfactory. The unhygienic sanitation system is common in slums (Panda, P. et al. 1993). Slum roads are narrow and unpaved, and slum dwellers have to face waterlogging, which is a very common problem during the rainy season in slum areas. This condition is very unhygienic for slum dwellers, which causes a various number of contagious diseases (Kaviarasu, S. J., & Xavier, G.G 2015). Lack of landownership is a vital problem for the slum dwellers. The slum houses are built on government encroachment land or public land, or marginal land parcels like roadways, railway setbacks and undesirable wetland land. They usually use the abandoned land for their settlement. They are vulnerable to water logging areas and insecure environments (Siegel, C. et al. 1997) and Kamruzzaman, M. 2015). Socio-economic factors are very crucial components in the study of any society, such as a slum. Social factors such as gender, religion, Caste, Age group, Family size, Marital Status, Level of education, etc, give us an idea about the society or person's goal. The family's economic Status depends on social factors such as educational attainment, Size of family, monthly income, savings, etc. Socioeconomic Status is generally used to define factors about a person's lifestyle, including the type of family, Education, occupation, income, housing, etc. Socioeconomic Status and social class determine life chances. Major representations of life chances are controlled fertility and massive child mortality (Bollen, K. A. et al. 2015; and Kimani-Murage, E. W., & Ngindu, A. M. 2007). According to the 2011 census, there were 25 slum wards, which means the slum population is distributed in most of the 25 wards out of 26 wards of Haldia municipality. The most important demographic and economic characteristics are discussed in the actual distribution of the slum population in different wards. Literacy and education are vital indicators that flow all changes and progress; among the slum population, the literacy rate is woefully low (Khan, M. Z., & Dassi, A. 1998). The work aims to understand the socioeconomic Status of slum dwellers in five municipalities of Purba Medinipur.

2. OBJECTIVES OF THE STUDY:

The study has two broad objectives. First, study the over-all socio-economic pattern of the municipalities of Purba Medinipur District. Second, it aims to determine the developmental Status of the municipalities in terms of their present pattern.

3. DATABASE AND METHODOLOGY:

3.1 The Study area:

Purba Medinipur, the southernmost district of the Burdwan Division of West Bengal, extending over an area of 4,151.64 square kilometres, is situated between the parallels of 21°36'35″ N and 22°57'10″ N latitudes and meridians of 86°33'50″ E and 88°12'40″ E longitudes. It was formed on 1st January 2002 after the partition of the former Medinipur district into Purba Medinipur and Paschim Medinipur, which lies at its northern and western border. The state of Odisha is at the south-west border, whereas the Bay of Bengal lies in the south; the Hooghly River and South 24 Parganas district to the east and Howrah district to the north-east. The headquarters is located at Tamluk. It has four Sub-division, namely Tamluk, Contai, Haldia and Egra, 25 Blocks, 21 police Stations, 5 Municipalities, 223-gram Panchayat and 11,796 villages. The district can be reached from Kolkata by NH-6 via Howrah, which enters the district at Kolaghat on The Rupnarayan River. The South-Eastern railway lines from Howrah station enter the district at Kolaghat and leave the district at Khirai station.

The geological formation of the district is alluvial, which occupies the whole north and central part, but in the south and east, gradually gives way to the ordinary alluvial. The drainage system of Purba Medinipur district consists of river Hooghly and its tributaries (Rupnarayan, Rasulpur and Haldi). Other important rivers are Kasai, Kaliaghai, and Subarnarekha. The soil of the Purba Medinipur district can be divided into two major groups – alluvial soil and coastal soil. The climatic characteristics of the Purba Medinipur district are a hot and humid type, but the climatic pattern of the north and west is very different from the east and south. The eastern and southern part of the district is influenced by cyclones originating over the Bay of Bengal. The northern and western parts are characterized by dry heat in the hot weather and moderate rainfall. Purba Medinipur district has 5.34 percent of the area and 5.58 percent of the total population of West Bengal. As per the census 2011, the district has 5.58 percent of population, which is

Journal of Information Systems Engineering and Management
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e-ISSN: 2468-4376
https://www.jisem-journal.com/

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5,095,875. The average population density was 1076 people per square kilometre in 2011. The decadal growth rate from 1991 to 2001 13.02 and is 17.21 from 2001 to 2011.

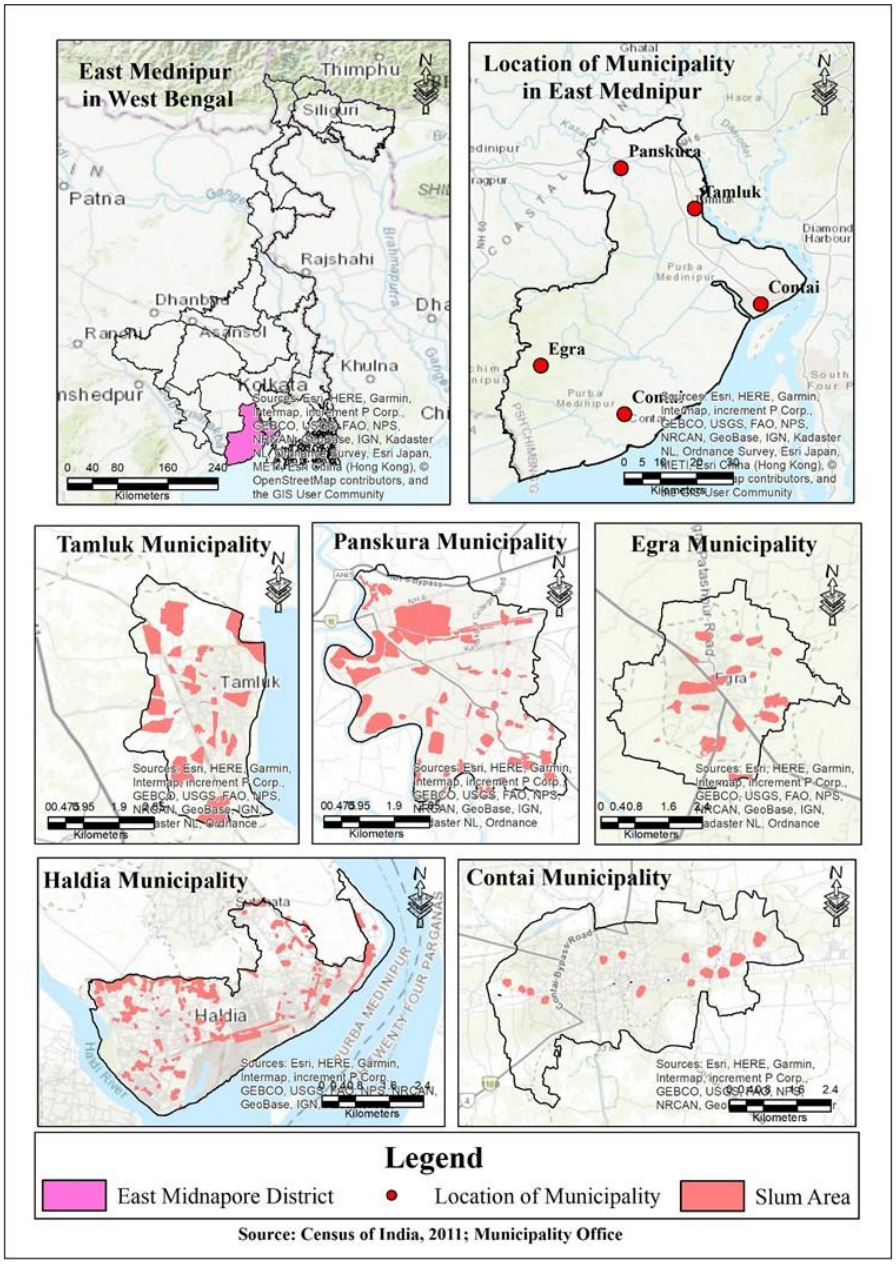

Fig. 1 Location of the study area.

Table 1: Selection the overall variable.

Components	Variables	References
Demographic Profile	Family Size	Martinez et al. (2008), Moser (1998),
	Educational status	Liu and Li,(2016)
	Economic activity	Ehrenpreis (2006), Mondal et al. (2021),

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e-ISSN: 2468-4376
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Economic Status	Monthly income	McClelland and
Housing and Amenities	Types of houses	Majale (2006),
	Average number of rooms	Alder (1995),
	Source of drinking water	D Das (2007), Krishnan et al.(2020)
	Latrine facility	Tanni et al. (2014),
	Types of roads	Sydunnaher et al. (2018)

3.2 Selection of the Variables.

In a study of municipalities socio economic status, components are very vital: material well-being, health, education and literacy, participation in the productive sphere, and participation in the social sphere (Stewart, K.,2002). The present study deals with the Socio – economic status of the slum dwellers of municipalities of Purba Medinipur, which is basically dependent on several selective objective indicators of Socio – economic status, as it is easily available, quantifiable and obviously relevant to the present work. The most essential components selected for the purpose are Demographic profile, Economic status, Housing and Amenities, which are derived mainly from sample households of the slum areas in the study area. Each component is further sub-divided into several variables which basically explain the result using.

Table 2: Selection of the variables with weight age value.

Variables	Parameters	Indicators	Weight age Value
X1	Family Size	Up to 5	1
		5 to 8	2
		Above 8	3
X2	Education level	Primary	1
		Secondary	2
		Above secondary	3
X3	Occupational pattern	Primary	1
		Secondary	2
		Tertiary	3
X4	Monthly income	Upto- 5000	1
		5000 - 10000	2
		Above - 10000	3
X5	Type of Houses	Katcha	1
		Semi Pucca	2

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2025, 10(55s)
e-ISSN: 2468-4376
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		Pucca	3
X6	Average no. of room	Upto - 1	1
		1 - 2	2
		Above - 3	3
X7	Road types	Broken	1
		Unmetalled	2
		Metalled	3
X8	Drinking water	Open-source water	1
		Supply water	2
		Own purified water	3
X9	Sanitation	Open deification	1
		Community	2
		Own septic	3

Source: Primary survey

3.3 Criteria for the selection of study area.

The study slums were chosen based on two criteria:

(a) Firstly, three wards have been chosen for each municipality of Purba Medinipur based on higher, medium and lower concentrations of slum population in relation to the entire ward population.

(b) Secondly, three slum related wards are chosen depending on the distance from the core area of each municipality. One slum was chosen as the city's heart. Other slums were chosen from the peri-urban area, which has a medium density of development than the central area. The last slum was chosen from the longest distance coverage ward in the municipality. A total of fifteen wards were selected from five municipalities. According to the municipality's report and discussions with local administrators (councillors from those wards), 1780 households have been established in these fifteen slums. Rashpukur jhupri (S.c -125), ward no- 11 of Haldia municipality, has the highest number of slum dwellers, and as well as slum households.

3.4 Sampling and sampling size.

Municipal authorities of purba Medinipur estimate that there are 1780 total households in fifteen slums (Census of India, 2011). total of 1780 slum dwellers households were selected using the formula below (Yamane. 1973).

$n = N/\ 1 + Ne2$ (1)

where N is the household size (1780), and e is the level of precision (here ± 5 per cent precision level), assuming a 95 per cent confidence level and p = 0.5. After getting the sample size of 326 using the above equation (Eq. 1), The authors used Yamane's formula for sample size.

selection as the numbers of HHs in the slums of municipalities of Purba Medinipur are known and not infinite in nature. The slum wise sample size has been determined (Table 3) using a proportionate allocation approach using Eq. 2.

$n1 = n * (N1/N)$ (2)

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e-ISSN: 2468-4376
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where *n1* = sample size for selected, *n* = total sample size, *N*1 = selected slum households and *N* = Total households of the selected slums. For example, in case of Rashpukur jhupri (S.c -125), ward no- 11 of Haldia municipality slum, the sample size has been found

= [326*(420/1780)] = 76.92 = 77. A minimum of ten household surveys should be done in each small slum area or ward.so the total sample is 348 households. A detailed list of surveyed households from each selected slum have been given in

Table 3: Sample size of Municipalities of Purba Medinipur:

Name of Municipality	Ward no	Slum Name / any three slums of each municipality	Household	No of Sample
Haldia	13	Rashpukur Jhupri (S.C.-125)	420	77
	16	Geondab Paschim Para (S.C.-071	137	27
	19	howanipur Culvert Colony (S.C.-132)	10	10
Tamralipta	9	Balbal Para	210	38
	10	Rail Colony Para (S.C.-023	157	29
	16	Sweeper Colony Bastee (S.C.-018)	47	10
Contai	3	Mansatala Para (Paschim)	67	12
	8	Barik Para	43	11
	4	Nakku Para	19	10
Egra	6	Giripara Adibasi Colony	110	20
	13	Sitala Mandir Para	169	31
	7	Majhi Para	17	10
Panskura	2	Kanakpur Modhya bandh	117	21
	9	Muslim para	81	15
	17	Tilandapur Harijan Mali & Madhyapara	92	17

Source: Municipalities office

3.5 Data collection method.

Both Primary and secondary data were used in this study. The field survey was conducted among notified slums of all municipalities of Purba Medinipur. Secondary data have been collected from the District statistical Handbook, public reports, the Census of India and also all municipality's offices. Primary data have been collected through structured questionnaires. The survey was conducted using a random sampling survey method. Slum households were surveyed from each ward using random survey methods. Slum pockets selection processes will be taken based on high and low population concentration pockets in a municipality ward. All the analyses have been represented in a GIS environment through Arc GIS. To find out the Socio-economic Status of slum dwellers, three components have been used, such as Demographic profile, Economic Status and Housing and Amenities. After the finalization of the questionnaire, a household survey has been conducted on 348 households in fifteen different slums of the municipalities of Purba Medinipur (Table 3).

3.6. **Data Processing & Analysis**:

The prefilled-up schedules were scrutinized after the completion of field work, and the data was tabulated for analysis. The obtained data was analysed by Statistical and Cartographic techniques. Statistical measures like, Composite index, standard deviation technique (Bracy,1952 Singh and Rana P.B. Singh, 1979) have been used to determine the

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Socio-economic Status of slum dwellers. 3-point Likert scale (Aybek, E. C., & Toraman, C. 2022). has been used to determine the municipality wise classification phase (High (Developed), Moderate (Developing), Low (Underdeveloped). Data was also represented with the help of several cartographic techniques under the GIS platform through Arc GIS.

4. METHODOLOGY:

This study used 9 variables under 3 dimensions in the first objective, and the second objective fulfilled with 9 variables. To fulfil the objective, weight age, composite score, 3-point Likert scale and standard deviations technique have been used. The weight age of a particular variable is given based upon the degree of its influence on the slum socio economic status. Highest weight age values (3) were given to the variables which determine a good Socio-economic status and lowest weight age (1) values were given for a poor Socio-economic status. All raw values of particular indicators have been selected as percentage values. Then, the percentage value of Individual indicators has been multiplying by selected weightage value **(**Haldia Municipality, Weightage value of Pucca indicators = (Share of household in particular indicators (Pucca) X Weightage value 3 (Table 1))/100). After that, all the individual indicator's weightage values have been as sum values in the particular parameter (Housing Condition). To calculate the composite index based on nine variables such as Family Size(X1), Education level(X2), Occupational pattern(X3), Monthly income(X4), Type of Houses(X5), Average no. of room(X6), Road type(X7), Drinking water(X8), and Sanitation(X9) have been chosen to find out the developmental status of the municipalities in terms of their present pattern. To analyse the present socio-economic Status, individual parameter scores have been analysed as comparatively in municipality wise and also represented in GIS environment. Finally, the whole sums of selected parameters score individual Municipality wise, have been categorised on the composite score of Socio-economic Status.

5. RESULT AND DISCUSSION:

Demographic Status of slum dwellers:

Slum regions are the common phenomenon in India as well as all over the world (Khan, M. I. 2013; Kamruzzaman, M., & Hakim, M. A. 2015; Kimani-Murage, E. W., & Ngindu, A. M. 2007; and Khan, M. Z., & Dassi, A. 1998)These are the product of socio- economic conditions of a particular social system inhibiting the physical, mental, moral and social development of the individuals (Tripathi SC & Arora V., 2010).

The bar chart (Fig.2(a) Family Size of the slum dwellers of different municipalities) illustrates the distribution of family sizes among slum households across five municipalities: Haldia, Tamluk, Contai, Egra, and Panskura. The family sizes are categorized into four groups: 0-3 members (blue bars), 4-5 members (red bars), 6-8 members (green bars), and more than 8 members (purple bars). In all municipalities, the most prevalent family size is 4-5 members, as shown by the dominant red bars, with Contai having the highest proportion (37.50%). Families with 0-3 members comprise a significant share across all municipalities, notably in Contai (37.50%) and Panskura (26.55%). Households with 6-8 members represent a smaller proportion, with a relatively higher percentage in Haldia (24.05%) and Panskura (16.05%). The proportion of families with more than 8 members is the lowest in all areas, with percentages remaining below 4%, highlighting that larger family sizes are rare. Overall, the chart indicates that medium-sized families (4-5 members) are predominant among slum dwellers, with a noteworthy portion of smaller families (0-3 members) and relatively fewer large families (6-8 members or more). The data suggests a trend toward moderate family sizes in the slum communities of these municipalities.

Education status helps the economic development of a region or country; it is also a basic indicator of upliftment of a society. Education controls the social and emotional development of individuals. Good skill and knowledge come from sound educational system, Which, in turn, provides power, income and Social Status. "Mother's education is a powerful tool which helps them break some of the traditional norms and makes them relatively more independent in taking decisions about the family situation" (Roth, E. A.1991). The bar chart (Fig.2(b) Educational Status of the slum dwellers of different municipalities) represents the educational Status of slum dwellers across five municipalities: Haldia, Tamluk, Contai, Egra, and Panskura. The categories range from illiterate to various levels of formal education, including primary, upper primary, secondary, higher secondary (HS), graduate, technical, and others/postgraduate (PG). Across all municipalities, the most common level of education attained is secondary, with significant shares in

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e-ISSN: 2468-4376
https://www.jisem-journal.com/

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Haldia, Egra, and Panskura, all nearing 35-40%. A noticeable number of individuals also have upper primary education, especially in Tamluk and Contai. Illiteracy rates are relatively high, with Egra and Tamluk showing a notable percentage of illiterate individuals. The representation of individuals with higher secondary education is moderate across all municipalities. However, the share of graduates and those with technical education is minimal, indicating limited access to higher education in these communities. Other categories, such as technical education and others/PG, show very low percentages, revealing that only a small portion of the population has advanced qualifications. Overall, the chart highlights that while secondary education is prevalent, a substantial segment of slum dwellers either have no education or only primary to upper primary levels, with higher education being rare across these municipalities.

The analysis of two bar charts provides insights into the demographic patterns among slum dwellers across five municipalities: Haldia, Tamluk, Contai, Egra, and Panskura. Family size predominantly falls within 4-5 members, highlighting a trend towards moderate-sized families. Educational attainment is primarily at the secondary level, especially in Haldia, Egra, and Panskura, while illiteracy and minimal higher education highlight a lack of access to advanced learning. Collectively, the charts depict a workforce-driven demographic with moderate family sizes, limited educational advancement, and predominant caste composition of General households among slum dwellers across these regions.

Economic Status of Slum dwellers in Different Municipality of Purba Medinipur

The occupational structure of any population is the most important indicator of the level of development of the community. The occupation structure determines the income structure of the community (Pothana, 1991). Types of jobs and the nature of the jobs is one of some important determinants in measuring socio-economic status of slum dwellers. “Child lives in the environment of economic insecurity” (Swaminathan, M.S.,1992). The bar chart (Fig.2(c) Status of Economic activity of the slum dwellers of different municipalities) depicts the economic activities of slum dwellers across five municipalities: Haldia, Tamluk, Contai, Egra, and Panskura. The activities are categorized into daily wage earners, business, service, industrial labor, primary activity, salaried class, and pension. The majority of the population in all municipalities are daily wage earners, with Haldia, Tamluk, and Contai having over 50% in this category, indicating a significant reliance on daily labor. Primary activities, such as agriculture or related work, are prominent in Egra, representing a notable share of the population. Business and service occupations are present across all municipalities but in smaller proportions compared than daily wage earners, with Tamluk showing a relatively higher involvement in business. Industrial labor is notably higher in Haldia, aligning with its industrial landscape, while it is minimal in other municipalities. The salaried class represents a small population segment, with a slightly higher proportion in Tamluk and Panskura. Pensioners constitute a minor share across all municipalities, indicating that few slum dwellers are retired. Overall, the chart highlights that daily wage earning is the primary economic activity among slum dwellers, with variations in other activities like business, primary activity, and salaried work across different municipalities.

The bar chart (Fig. 2(d) Monthly income scenarios of the slum dwellers of different municipalities) presents the monthly income distribution among slum households across five municipalities: Haldia, Tamluk, Contai, Egra, and Panskura. The urban poor are mostly attached in self-managed low paid jobs in the urban sector to cope with urban life. The income categories are divided into three brackets: less than 5,000 (purple bars), 5,000-10,000 (blue bars), and more than 10,000 (orange bars). Across all municipalities, the majority of households fall into the income bracket of over 10,000, with Panskura showing the highest share in this category (around 75%). Tamluk, Contai, and Egra also exhibit a significant portion of households earning more than 10,000, indicating a similar trend. The 5,000-10,000 income brackets are well represented in Haldia and Egra, making up around 30-35% of the households, suggesting a considerable middle-income segment in these municipalities. However, the lowest income bracket (less than 5,000) is least represented across all areas, particularly in Panskura and Tamluk, where it accounts for a minimal share of the households. Overall, the chart indicates that a significant proportion of slum households in all municipalities earn over 10,000 per month. This suggests an upward trend in household income among the slum dwellers in these areas, with variations in income distribution across different municipalities.

The analysis of two bar charts reveals economic patterns among slum dwellers across five municipalities: Haldia, Tamluk, Contai, Egra, and Panskura. Daily wage earners across all regions dominate economic activities, with

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e-ISSN: 2468-4376
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significant primary activities in Egra and notable business involvement in Tamluk. Income distribution (Fig. 2(c) shows a majority earning over ₹10,000 per month, particularly in Panskura, while fewer households fall below ₹5,000, suggesting an upward trend in slum household incomes. Savings (Fig. 2(d)) indicate that many households have no or minimal savings, particularly in Haldia and Contai, though some in Panskura and Contai save between ₹1,000 and ₹5,000 monthly. Overall, the charts suggest economic dependence on daily wages, growing incomes, and limited savings among slum dwellers.

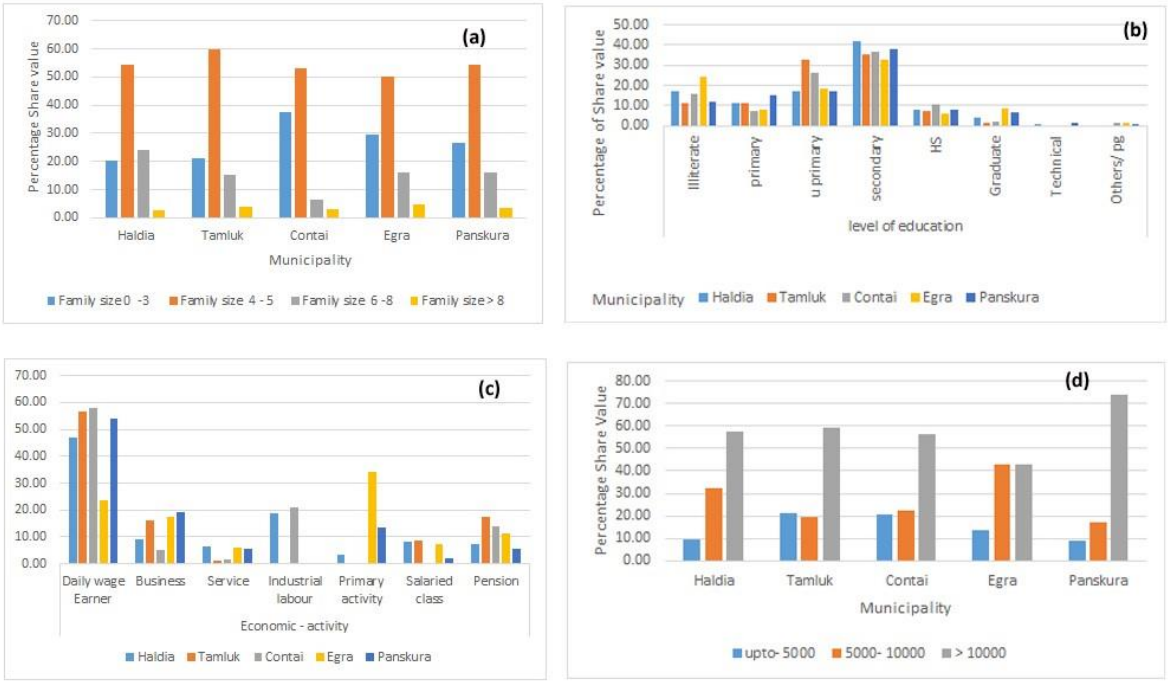

Fig: 2 (a) Family size. (b)Education status. (c) Economic activity. (d) Monthly income.

Housing and Amenities Status:

The bar chart (**Fig. 3(a)**: **Types of houses of the slum dwellers of different municipalities**) illustrates the distribution of different housing types among slum dwellers in five municipalities: Haldia, Contai, Egra, Tamluk, and Panskura. The types of houses are categorized as Pucca (blue bars), Semi-Pucca (red bars), Katcha (green bars), and Thatched huts (purple bars). Across all municipalities, Pucca houses—permanent structures made with durable materials—are predominant, with over 60% of the settlements being Pucca in Haldia, Tamluk, and Panskura and slightly lower in Contai and Egra. Semi-Pucca houses, which are partly permanent structures, are the second most common type, with a significant share in Tamluk and moderate representation in Haldia, Contai, and Panskura. Katcha houses, built with temporary or non-durable materials, are notably present in Egra and Panskura but constitute a minor share in other municipalities. Thatched huts, characterized by temporary materials like straw or leaves, are most prevalent in Egra, where they represent a sizable portion of the housing, but they are minimal in Tamluk and Panskura. Overall, the chart shows that Pucca housing is the dominant type of settlement among slum dwellers, suggesting a trend towards more stable housing structures, while Semi-Pucca, Katcha, and Thatched huts are less common but vary across municipalities.

The bar chart (**Fig. 3(b) Average number of rooms of a house of the slum dwellers of different municipalities**) illustrates the average number of rooms per house among slum households across five municipalities: Haldia, Contai, Egra, Tamluk, and Panskura. The categories include one-room (blue bars), two-room (red bars), three-room (green bars), and four-room (purple bars) houses. In all municipalities, the predominant type is two-room houses, particularly in Tamluk (around 65%), Haldia (over 50%), and Contai (close to 50%). This suggests that most slum households in these areas live in moderately sized dwellings. Egra has a significant share of one-room houses (over 40%), indicating a prevalence of smaller living spaces. Panskura shows a more balanced

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2025, 10(55s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

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distribution among two-room, three-room, and four-room houses, suggesting a greater variety in house sizes. Three-room houses are more common in Panskura and Contai than in the other municipalities. In contrast, four-room houses represent a very small share across all areas, indicating that larger houses are rare among slum dwellers. Overall, the chart highlights that two-room dwellings are the most typical size for slum households across most municipalities, with a notable presence of one-room houses in Egra and varied room sizes in Panskura. The data suggests varying living conditions, with smaller homes being more prevalent.

The bar chart (**Fig. 3(c) Source of drinking water of the slum dwellers of different municipalities**) depicts the primary drinking water sources among slum households across five municipalities: Haldia, Contai, Egra, Tamluk, and Panskura. The sources are categorized as public taps (brown bars), individual taps (orange bars), and tube wells (red bars). In Tamluk and Panskura, individual taps are the most common source of drinking water, serving over 50% of households, suggesting a higher level of individual water access in these areas. Egra and Contai also have a significant share of individual taps, though less than Tamluk and Panskura. Tube wells are prevalent in Egra and Contai, accounting for nearly 50% and 40% of households, respectively, indicating reliance on groundwater sources in these municipalities. Haldia displays a relatively balanced distribution among public taps, individual taps, and tube wells, with public taps being the most common source. Public taps have a modest representation across all municipalities, providing water to approximately 20-30% of households, with the highest share in Haldia. Overall, the chart suggests that the primary source of drinking water varies across municipalities, with individual taps being dominant in Tamluk and Panskura, while tube wells are prominent in Egra and Contai, and a more balanced water source distribution is seen in Haldia.

The bar chart (**Fig. 3(d)**: **Latrine facility of the slum dwellers of different municipalities**) illustrates the share of families using different types of latrine facilities—individual, public, and open ground—across five municipalities: Haldia, Contai, Egra, Tamluk, and Panskura. It is evident that individual latrine facilities dominate across all municipalities, with the highest shares observed in Contai and Tamluk, reaching nearly 100%. Haldia and Egra also show high shares of individual latrines, although slightly lower than the other municipalities. Public latrine usage is minimal, with a noticeable share only in Haldia and Panskura. Egra exhibits a unique pattern where a considerable share of families still rely on open ground as their primary latrine facility. This trend is negligible or absent in other municipalities. In contrast, open-ground usage is not prominent in most municipalities, highlighting a shift towards more private facilities. Overall, the chart indicates a strong preference for individual latrines across all regions, with limited reliance on public or open-ground options. However, some regional disparities exist, particularly in Egra, where open defecation remains a significant practice. The chart reflects varied levels of access to and utilization of sanitation facilities by slum dwellers across different municipalities.

The bar chart (**Fig. 3(e)**) compares the types of roads—pucca (paved) and kutcha (unpaved)—across five municipalities: Haldia, Contai, Egra, Tamluk, and Panskura. Across all municipalities, pucca roads have a higher prevalence, indicating a relatively well-developed infrastructure. Panskura and Contai have the highest number of pucca roads, with settlements numbering around 80, while their kutcha road numbers remain significantly lower. Tamluk also displays a notable disparity between Pucca and Kutcha roads, favouring the former by a wide margin. Egra has a more balanced distribution between the two types of roads,but still shows a higher count of pucca roads. Haldia exhibits the most minor difference between pucca and kutcha roads, indicating a more even distribution, though pucca roads still predominate. The overall trend reveals that, while paved roads are more common across these municipalities, unpaved roads persist, particularly in Haldia and Egra. This suggests that while infrastructural development is advanced in these regions, certain areas still rely on kutcha roads, indicating potential for further road improvement and infrastructure Development in the municipalities.

Housing types (Fig.3(a) show a predominance of Pucca (permanent) houses across all municipalities, particularly in Haldia, Tamluk, and Panskura. Semi-Pucca houses are the second most common, notably in Tamluk, while Katcha and thatched huts are minimal, with Egra showing higher shares of these temporary structures. Room size distribution (Fig. 3(b) shows two-room dwellings as the most common across all municipalities, especially in Tamluk, Haldia, and Contai. Egra has a higher share of one-room houses, indicating smaller spaces, while Panskura has more variety with two, three, and four-room houses. Overall, the charts depict a trend toward stable housing with moderate space, though room sizes vary across municipalities. Drinking water sources (Fig. 3(c) vary across regions, with

Journal of Information Systems Engineering and Management
2025, 10(55s)
e-ISSN: 2468-4376
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individual taps being prevalent in Tamluk and Panskura, while tube wells serve as a primary source in Egra and Contai. Haldia displays a balanced distribution among public taps, individual taps, and tube wells. Sanitation facilities (Fig. 3(d) show a strong preference for individual latrines across all municipalities, especially in Contai and Tamluk. However, Egra stands out with a considerable share of families relying on open ground for latrine use, contrasting the overall trend towards private facilities. Road types (Fig. 3(e) indicate a dominance of pucca (paved) roads across all areas, particularly in Panskura and Contai, with fewer kutcha (unpaved) roads. However, Haldia and Egra show a more balanced presence of both road types, suggesting potential for further infrastructure development.

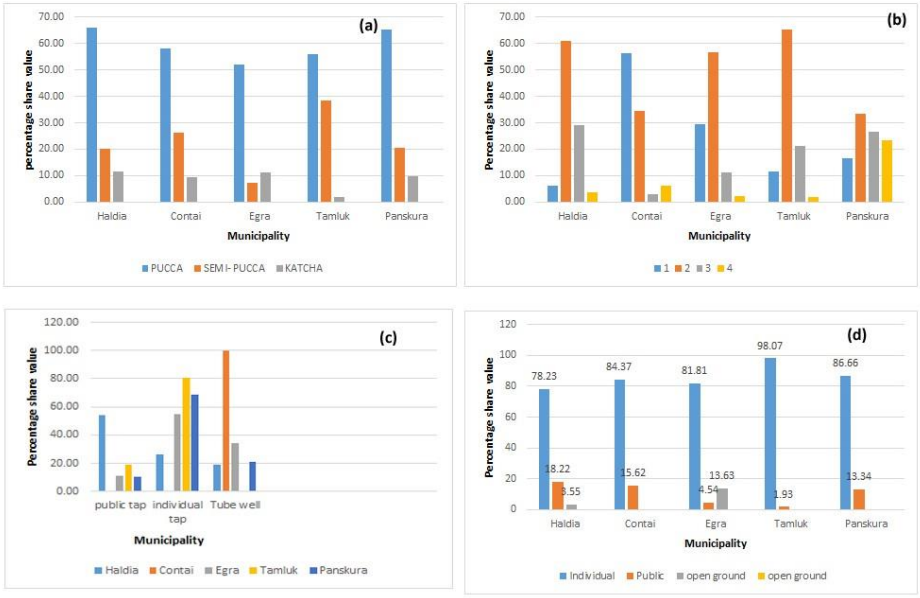

Fig. 3 (a) Types of houses. (b) Average number of rooms. (c) Source of drinking water. (d) Latrine facility.

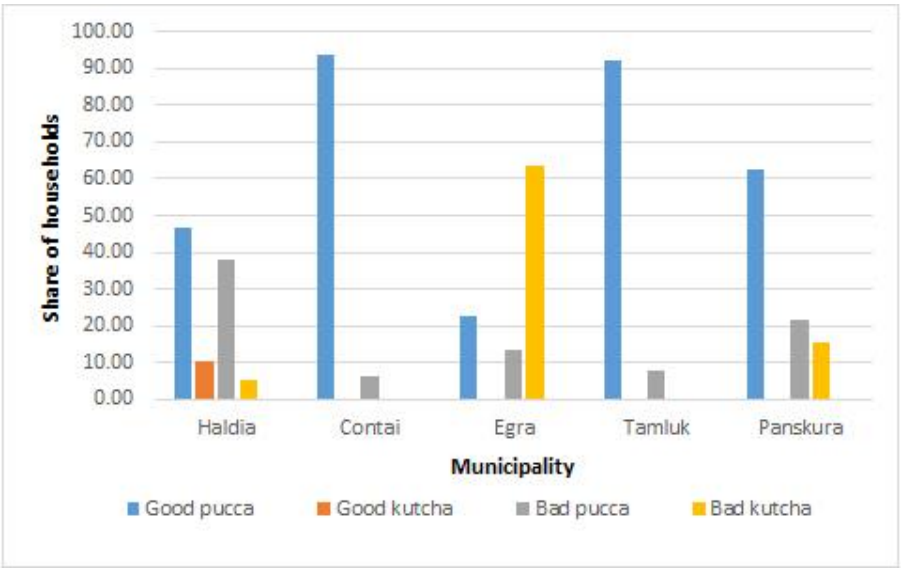

Fig. 3(e) Types of road.

To find out the developmental status of the municipalities in terms of their present pattern:

Journal of Information Systems Engineering and Management
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e-ISSN: 2468-4376
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Slums represent one of the most vulnerable sections of urban society, often marked by poverty, inadequate housing, poor sanitation, limited access to clean drinking water, and underemployment. In the context of Purba Medinipur District, a relatively developing region in West Bengal, the urban settlements and slums reflect diverse socio-economic patterns. This analysis explores five municipalities (Panskura, Haldia, Tamluk, Contai, and Egra) based on composite indicators that reflect family size, educational attainment, occupation, income levels, housing quality, access to infrastructure, and public services

Table- 4: Composite Score for Slums of Municipalities of Purba Medinipur

Name of the Municipality	X1	X2	X3	X4	X5	X6	X7	X8	X9	(X) Total	Mean	(X - Mean)	Sd	Rank
Haldia	1.30	1.68	1.67	2.48	2.49	1.97	2.22	1.88	2.75	18.44	18.09	0.35	.836	2nd
Contai	1.23	1.76	1.43	2.38	2.36	1.50	2.62	1.86	2.80	17.95	18.09	-0.14	.836	4th
Egra	1.12	1.75	1.35	2.36	1.81	1.73	2.31	1.69	2.61	16.74	18.09	-1.35	.836	5th
Tamralipta(Tamluk)	1.25	1.59	1.50	2.29	2.46	1.90	2.65	1.92	2.77	18.35	18.09	0.26	.836	3rd
Panskura	1.23	1.78	1.37	2.65	2.77	2.07	2.47	1.82	2.81	18.96	18.09	0.87	.836	1st

Source: Calculate by authors

Tab-5 Classification of Municipalities

Municipality	Composite Score	Range	Category (3-Point Scale)
Panskura	18.96	**16.74 – 17.48** (Low)	High (Developed)
Haldia	18.44		High (Developed)
Tamluk	18.35	**17.49 – 18.22** (Moderate)	High (Developed)
Contai	17.95		Moderate (Developing)
Egra	16.74	**(18.23 – 18.96** (High)	Low (Underdeveloped)

Source: Calculate by authors

Panskura Municipality:

Panskura Municipality ranks first in the composite index with a score of 18.96, indicating the highest socio-economic standard among the five municipalities. This indicates that slum settlements in this region exhibit comparatively improved infrastructure and access to amenities.

The average family size is small to moderate, suggesting trends toward nuclear families or effective population control. A reduced family size is associated with enhanced resource allocation per household. The educational attainment among slum residents is relatively high.

Journal of Information Systems Engineering and Management
2025, 10(55s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

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The majority of individuals participate in primary sectors, while a subset is involved in secondary sectors, indicating a reliance on manual labor, small-scale trades, and services. The score reflects a gradual transition toward a more diversified economy. A considerable segment of the population earns more than ₹10,000, which is noteworthy for a slum environment. This may be ascribed to remittances, local enterprises, or enhanced economic integration with adjacent urban markets. A significant proportion of residences are classified as pucca or semi-pucca, suggesting enhanced housing quality and potentially effective execution of governmental housing initiatives, such as PMAY. Increased housing space indicates improved living conditions and implies that the overcrowding problem may not be significant in this area. Roads are primarily metalled or semi-metalled, enhancing connectivity and emergency access, which are crucial for slum development. Some residents continue to depend on open-source or community water supplies, while a significant number have access to treated water; however, improvements are still necessary. Most households with a high score seem to possess private sanitation facilities. This is essential for mitigating health risks and environmental hazards. The slums of Panskura exhibit notable advancements, especially in terms of income, housing, and sanitation. Evidence indicates successful urban planning and policy intervention; however, water supply and education enhancements could further advance overall development.

Haldia Municipality:

Haldia, ranked 2nd with a score of 18.44, is a significant industrial township. The elevated socio-economic score of its slum areas indicates the positive externalities resulting from industrial development, particularly regarding employment opportunities. Marginally elevated compared to Panskura, indicating a moderate familial obligation. Demonstrates a satisfactory level of educational achievement. Proximity to industries can promote vocational training or skill-based education. Occupational diversity is significantly influenced by the industrial and service sectors. Manufacturing and logistics present significant opportunities.

Income levels are elevated due to employment opportunities in factories, ports, and associated industries. The quality of housing is generally satisfactory, characterized by numerous semi-pucca constructions. Nonetheless, certain regions continue to exhibit insufficient durability. Room availability indicates limited living space, presumably resulting from high-density urban planning. Infrastructure is generally well-developed; however, certain slum areas may experience inconsistent maintenance. Access to clean drinking water is moderate but not universal. The sanitation infrastructure is advanced, with the majority of residences utilizing septic systems or linked to the municipal sewer system. The industrial economy of Haldia positively impacts slum livelihoods. Water access and educational infrastructure improvements are essential for the comprehensive upliftment of slum populations.

Tamralipta Municipality:

Tamluk is positioned third with a score of 18.35, closely trailing Haldia. The slum population in this area gains advantages from its administrative significance and closeness to transportation routes. A moderate family size contributes to improved living standards, marginally below Haldia and Panskura. This may indicate a necessity for improved public education and retention strategies. Employment is primarily concentrated in the primary and secondary sectors, likely encompassing informal trade and agriculture-related activities. Income distribution is relatively equitable, with certain households achieving moderate earnings. The prevalence of pucca or semi-pucca housing reflects advancements in housing conditions. The living space provides adequate comfort for moderate needs. Well-developed roads indicate effective municipal management and enhanced accessibility. Access to clean water is nearly satisfactory; however, certain gaps remain. The municipality effectively manages sanitation, indicating a prioritization of hygiene and health infrastructure. The slums of Tamluk exhibit effective management, characterized by adequate road infrastructure and sanitation facilities. Increased emphasis on education and occupational diversification can significantly enhance quality of life.

Contai Municipality:

Contai ranks fourth with a score of 17.95. Although remaining near the average, slums in this area exhibit deficiencies in various development indicators. Positive demographic trend. Superior to Tamluk and in proximity to Panskura, indicating potential for long-term development. Employment is predominantly concentrated in the primary sector, with fisheries, agriculture, and informal work being the most significant components. Average income levels are adequate; however, income inequality could pose a concern. Marginally inferior to Panskura and Tamluk, yet

superior to Egra. A low score suggests overcrowded or shared living conditions. Well-maintained roads facilitate effective public service delivery. Improvements are still necessary for water quality and access. A high score indicates substantial investments in sanitation, whether public or private. Although education and sanitation in Contai slums are notable, challenges such as inadequate housing and limited occupational diversity hinder growth potential. Strategic urban renewal is essential for addressing these disparities.

Egra Municipality:

Egra is ranked 5th with a score of 16.74, the lowest among the five municipalities. This indicates significant challenges in all major socio-economic areas. Slightly favorable family structure. It is acceptable, though there is room for strengthening basic and vocational education. Heavily reliant on primary sector work. Lack of employment options hinders economic growth. Income levels are average, though sustainability may be questioned due to limited economic diversity. One of the poorest housing profiles—many homes likely to be katcha or semi-pucca. Overcrowding remains a concern. Road conditions are improving but not uniform across all slum areas. Access to clean water is suboptimal—potential for water-borne diseases is higher, slightly below the district average. Community toilets are common, but individual household facilities are lacking. Egra's slums lag due to poor housing, inadequate water access, and limited employment opportunities. Development efforts must prioritize basic infrastructure, education, and skill development.

CONCLUSION:

The analysis across multiple bar charts highlights socio-demographic and infrastructural patterns among slum dwellers in five municipalities: Haldia, Tamluk, Contai, Egra, and Panskura. There is a slight male majority, moderate family sizes (4-5 members), a predominance of working-age populations, and high marriage rates. The literacy rate is one of the most important indicators of the level of development of slum areas. So, literacy is unquestionably the largest source of human wealth, consisting of acquired abilities (Schultz, 1996). The slum literacy rate in all the municipalities, Halida (84.20%), Tamralipto (88.99%), Contai (84.13%), Egra (75.38%), and Panskura (87.97%) ,is higher than the national average literacy rate of 74.04% and also exceeds the West Bengal state average of 77.08%, according to the (Census,2011) except for Egra municipality. Secondary education is the most common, but higher education is limited. Economically, daily wage earners are prevalent, with most households earning over ₹10,000 per month, although savings are generally low. Housing is primarily pucca, with varied roof types and common two-room dwellings. Drinking water primarily comes from individual taps or tube wells, and while individual latrines are standard, sewage facilities are lacking in most areas. The most important determinant factors are Education, monthly income, type of houses, and Sanitation, which are the backbone of slums socioeconomic status of all municipalities. The three municipalities, i.e., Panskura, Haldia, and Tamluk are in high developed category. Contai is in a moderate developing phase, performing moderately well but lagging in areas like housing space and economic diversification. The worse socio-economic status is reflected in Egra municipality among all municipalities, suggesting better socio-economic conditions in their slums, with higher income, improved housing, better sanitation, and infrastructure. Egra and Contai need focused development policies addressing housing, employment, and water supply. All municipalities should aim to achieve 100% metalled road coverage and piped water access. Egra is classified as Underdeveloped, showing poor outcomes across most indicators, and requires targeted intervention. Overall, the works reflect a demographic with moderate living conditions, a workforce-oriented economy, limited savings, and significant disparities in infrastructure and amenities across the municipalities. Near about 50 percent of the slum population in the slums of Bombay and Chandigarh was illiterate (Gill M. S 2007). However, in all of slums of municipalities of Purba Medinipur literacy rate is higher than the National average, so, it is a most important and positive key factor The Government must assist and inspire more private entrepreneurs to generate more economic activities that can deliver better improvements of their socio-economic status.

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Journal of Information Systems Engineering and Management
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