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**Md. Ziaul Hoque**  
Assistant Teacher, Abbasganj  
High Madrasah (H.S.)  
Mothabari, Kaliachak, Malda,  
West Bengal, India

**Md. Emran Ali**  
Assistant Teacher, Birnagar  
High School (H.S.), Palgachi,  
Baishnabnagar, Malda, West  
Bengal, India

## Concentration of emerging census towns of C.D. Block Kaliachak-I in Malda district: Location quotient and rank size rule analysis

**Md. Ziaul Hoque and Md. Emran Ali**

### Abstract

Town is the creation of human being. Census of India has defined census towns as places that satisfy three fold criteria of total population 5000 or above, 75 percent of male working population engaged in non-agricultural activities and density of 400 persons per sq km. In the census 2001, the census town of Malda district was only 3. The figure has rapidly change in the census 2011 and reached the number 27. The distribution of Census towns of Malda district is very uneven, maximum number is in Kaliachak-I as Non- Statutory towns. Community Development Block Kaliachak-I share 33.33% of census towns of Malda district. Out of 27 census towns of Malda district 11 are located in the study area. The paper analyze the demographic feature and dimension of concentration of census towns in the study area. The paper also tries to find out the distribution of population by Location Quotient and Rank Size Rule analysis.

**Keywords:** Non-statutory town, demographic features, location quotient, rank size rule

### Introduction

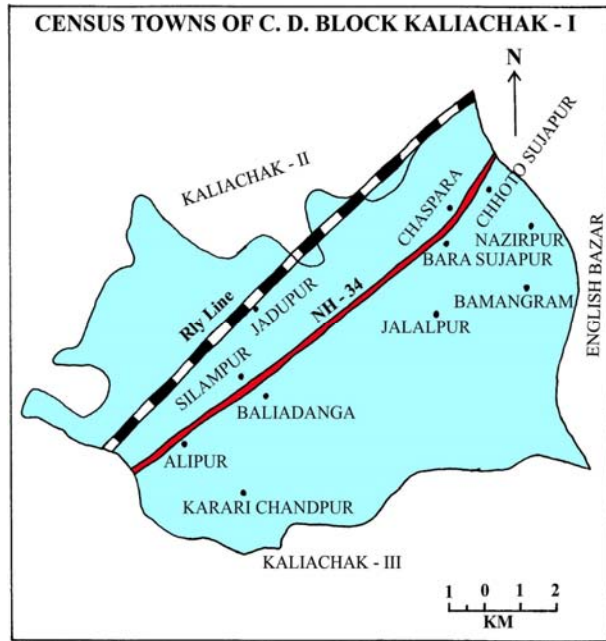
Tourist The population density of urban area differs from geographical region to region. Regarding the definition of urban settlement demographer, differ from each other. According to the census 2011, the definition of urban settlement 1.The area directed by the municipality, corporation, or corporation board or notified area committee. 2. (a). The area should contain minimum 5000 population. (b) The population density of the area should be 400 person/sq km. (c) 75% of male worker are engaged in the non-agricultural activities. The areas tallies with the point no. 1 called statutory town. The law and status of the state or central government recognise these towns. The laws and statutes of state do not recognise the towns' tally the point no. 2 or central government called Census Town. In pursuance of the census 2011, the total no. of towns and cities in India is 7935. Among them, the number of statutory town is 4041 and Census Towns is 3894. In West Bengal no. of statutory town is 129 and the no. Of Census Towns are 782. In Malda district, the total number of census town is 27 and two is statutory. Among these census towns, 11 are situated in Kaliachak-I.

**Study Area:** Kaliachak is located in the southern part of Malda district in West Bengal. Kaliachak consists of three blocks. These are known as Kaliachak-I, Kaliachak-II, Kaliachak-III. Kaliachak Block-I extends between latitudes 24°48'11" N to 24.803° N and longitudes 88°01'44" E to 88.029° E. It is spreading over on area of 106.60 Km<sup>2</sup> supported with large number of population 392507.

**Objectives:** The objectives of the paper are-

- (i) To analyze the demographic features of the census towns in the study area
- (ii) To find out the dimension of concentration of census towns in the study area
- (iii) To examine the Location Quotient analysis of the distribution of population
- (iv) To examine the Rank Size Rule analysis of the distribution of population

**Correspondence**  
**Md. Ziaul Hoque**  
Assistant Teacher, Abbasganj  
High Madrasah (H.S.)  
Mothabari, Kaliachak, Malda,  
West Bengal, India



**Data base and methodology:** The paper is based mainly on secondary data, which has been collected from community block development office, article in journals, innumerable newspapers and Census of India 2011. The compiled data are interpreted appropriately by statistical method of percentage, ratio, Standard deviation, Location Quotient and Rank Size Rule. The data is presented by means of cartographic technique to find out the objectives of the study.

**Review of related literature**

1. Karmakar. J. (2015) [1] conducts a research paper, find out the spatial distribution and size classification of census towns of West Bengal with respect to the four regions and districts respectively. He also find out the socio-economic condition of the census town include literacy rate, sex ratio, work participation rate, female worker participation rate availability of work through main & marginal workers.
2. Aktar. N. & Sultana. C. (2014) [2] publish a research paper, find out the existing level of urbanization in terms of emerging spatial patterns and suggest, if any, plan strategies to cope up with the distortions introduced in the patterns of urbanization of West Bengal.
3. Bhowmick. & Sivaramakrishna (2015) [3] conduct a research paper of Haora District in the changing scenario of urbanization and find out the tendency of residents to flee from the most urbanization part of the district towards the blocks of mainly rural part, which shows that a new chapter is commencing. This process ultimately influences the sub urban growth and this statement proved by the visual, quantitative and qualitative interpretation of the urban structure of the concerned district and find out increasing number of census towns that denotes the deconcentration of population from the urban core to the periphery.

**Need for the study:** An important aspect of urbanization in the world is the uneven pattern of development and distribution of small towns and big cities within a system.

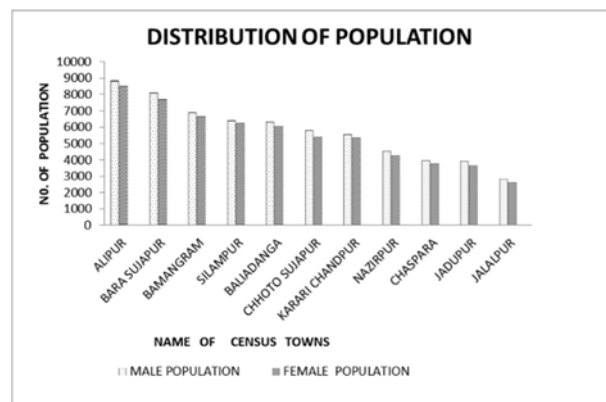
The sudden reversal of demographic and also urbanization pater in West Bengal indicates a flicker of in situ urbanization which is no doubt very weak in India but it is important for urban sustainability. A visual investigation of the Census of India 2011 confirms the tremendous increase in the number of invisible towns (Commonly known as census towns or non-statutory towns) in India where West Bengal registered the highest number of census towns. There are two municipalities in the district of Malda namely Old Malda and English Bazar. There is Twenty-seven Census Towns (CT) in the district. Among them 11 census towns situated in the Kaliachak-I that indicate the changing stage of urbanization pattern of Malda District. This paper would help the urban experts, planners and researchers for the development of socio-economic and cultural phenomenon in the study area.

**Demographic features**

**Total population:** According to the census 2011, the total population of Census Town C.D. Block Kaliachak -I is 123474, which share 31.45 percentages of entire the block. The male population is 51.21 percentages and female population is 48.79 percentages in the census towns of the block.

Name of census town	Male Population	Female Population	Total Population
Alipur	8841	8506	17347
Bara Sujapur	8129	7699	15808
Bamangram	6905	6645	13550
Silampur	6404	6260	12664
Baliadanga	6340	6039	12379
Chhoto Sujapur	5808	5408	11216
Karari Chandpur	5571	5370	10941
Nazirpur	4528	4250	8778
Chaspara	3963	3763	7731
Jadupur	3918	3667	7585
Jalalpur	2831	2629	5460
Total	63238	60236	123474

Source: Census of India, 2011



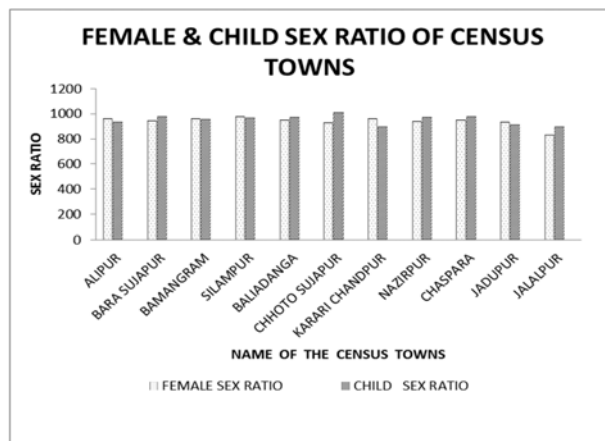
According to the above table, the highest population is 17347 in Alipur and the lowest population is 5460 in the census town of Jalalpur in Kaliachak-I block. Flowing data show that Bara Sujapur (15808), Bamangram (13550), Silampur (12664), Baliadanga (12379), Chhoto Sujapur (11216), Karari Chandpur (10941), Nazirpur (8778), Chaspara (7731), Jadupur (7585).

**Sex Ratio:** The census 2011 shows the female sex ratio of census town height is 978 in Silampur and the lowest is 929 in Jalalpur.

Name of census town	Female Sex Ratio	Child Sex Ratio
Alipur	962	936
Bara Sujapur	945	979
Bamangram	962	958
Silampur	978	969
Baliadanga	953	972
Chhoto Sujapur	931	1013
Karari Chandpur	964	899
Nazirpur	939	973
Chaspara	951	982
Jadupur	936	913
Jalalpur	929	897
Average	950	954
Standard Deviation	14.83	27.58

Source: Census of India, 2011

The female sex ratio of Alipur and Bamangram is 962, others are Bara Sujapur (945), Baliadanga (953), Karari Chandpur (964), Nazirpur (939), Chaspara (951), Jadupur (936) and Jalalpur (929). All the census towns are above the urban India (926), West Bengal and Malda district female sex ratio is 949.



The Census data shows that the child sex ratio is 936 in Alipur, others are 979 in Bara Sujapur, 958 in Bamangram, 969 in Silampur, 972 in Baliadanga, 1013 in Chhoto

Name of census town	Total literacy rate (%)	Male literacy rate (%)	Female literacy rate (%)	Gender Gap (%)
Alipur	64.23	69.12	59.18	9.94
Bara Sujapur	77.54	77.93	77.13	.8
Bamangram	72.29	71.41	73.19	-1.78
Silampur	56.98	61.19	52.68	8.51
Baliadanga	76.00	79.71	72.10	7.61
Chhoto Sujapur	77.32	77.67	76.95	0.72
Karari Chandpur	52.36	56.72	47.89	8.83
Nazirpur	62.06	60.64	63.58	-2.94
Chaspara	75.82	75.49	76.18	0.69
Jadupur	72.81	76.29	69.10	7.19
Jalalpur	73.93	77.89	69.68	8.21
Average	69.21	71.28	67.06	4.34

Source: Census of India, 2011

Sujapur, 889 in Karari Chandpur, 973 in Nazirpur, 982 in Chaspara, 913 in Jadupur and 897 in Jalalpur. Chhoto Sujapur and Jalalpur are the below of national 902 in urban India and Malda district urban 960 child sex ratio.

**Children:** The total child of the census towns is 19697, which share the 15.95 percentages of the total population of this block.

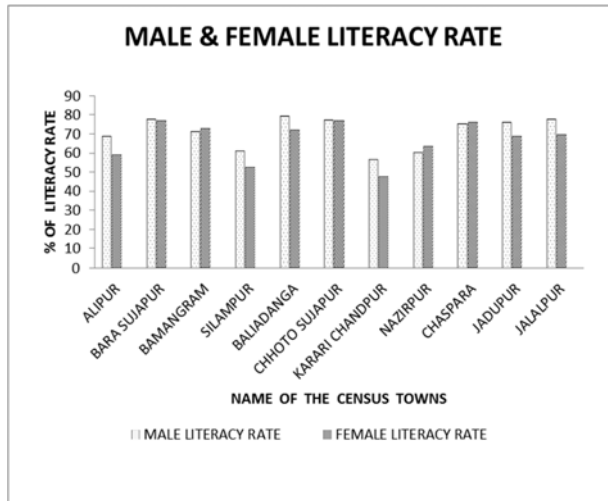
Name of census town	Total Children	% Of Total population
Alipur	2772	15.98
Bara Sujapur	2505	15.85
Bamangram	2213	16.33
Silampur	2097	16.56
Baliadanga	1706	13.78
Chhoto Sujapur	1757	15.67
Karari Chandpur	1777	16.24
Nazirpur	1580	18.00
Chaspara	1225	15.85
Jadupur	1234	16.27
Jalalpur	831	15.21
Total = 19697		Average=15.95

Source: Census of India 2011

The more number of children is 2772 in Alipur, following by Bara Sujapur (2505), Bamangram (2213), Silampur (2097), Karari Chandpur (1777), Chhoto Sujapur (1757), Baliadanga (1706), Nazirpur (1580), Jadupur (1234), Chaspara (1225) and Jalalpur (831) is the lowest number, amounting 660

**Literacy rate and Gender Gap:** Average literacy rate of census town in Kaliachak is 69.21 % and male is 71.28 % while female is 67.06 %

It is observed on perusal of the below table that the literacy rate is not equal among the census towns. They have gap and difference. In accordance with census 2011, there are 27 census towns in Malda district. Among these 27 census town-11 census towns situated at Kaliachak I. According to the table the literacy rate of census town in Alipur is 44.79, Bara Sujapur is 77.54%, Bamangram is 72.29%, Silampur is 56.98%, Baliadanga is 76.00%, Chhoto Sujapur is 77.32%, Karari Chandpur is 52.36%, Nazirpur is 62.06%, Chaspara is 75.82%, Jadupur is 72.81% and Jalalpur is 73.93%

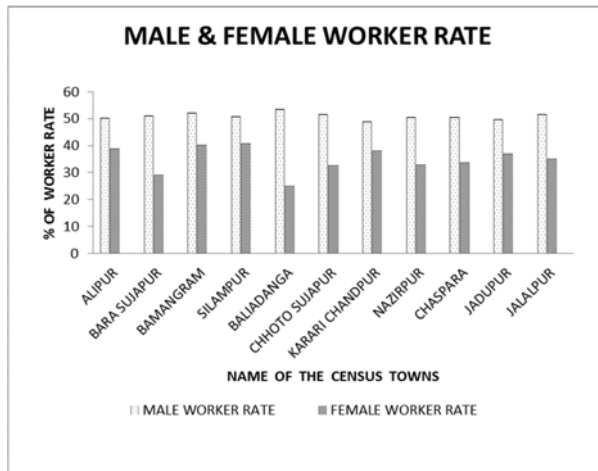


Following the data the male literacy rate is 69.12%, female is 59.18% in Alipur and Gender Gap is 9.94%. In Bara Sujapur, Chhoto Sujapur and Chaspara gender gap in literacy rate is very scanty that is .8%, female literacy rate is more than male in Bamangram and Nazirpur. The male and female literacy rate is 61.19% and 52.68% respectively in Silampur and Gender Gap is 8.51%. In Baliadanga the male literacy rate is 79.71% and female is 72.10%, Gender gap is 7.61%. In Karari Chandpur, the male literacy rate is 56.72%, female is 47.89% and Gender gap is 8.83%.

**Worker rate and gender gap:** In census 2011, the worker rate is very low in the census town of Kaliachak-I in Malda district. Data show that in Alipur the worker rate is 64.23%, In Bara Sujapur is 40.44%, in Bamangram is 46.35%, in Silampur is 45.87%, Baliadanga is 38.38%, Chhoto Sujapur is 42.56%, Karari Chandpur is 43.79%, Nazirpur is 42.04%, Chaspara is 42.33%, Jadupur is 43.66% and Jalalpur is 43.04%

Name of census town	Total worker (%)	Male worker rate (%)	Female worker rate (%)	Gender Gap (%)
Alipur	44.79	50.29	39.06	11.23
Bara Sujapur	40.44	51.05	29.20	21.85
Bamangram	46.35	52.12	40.36	11.76
Silampur	45.87	50.81	40.81	10
Baliadanga	38.38	53.48	25.20	28.28
Chhoto Sujapur	42.56	51.82	32.61	19.21
Karari Chandpur	43.79	49.11	38.26	10.85
Nazirpur	42.04	50.50	33.03	17.47
Chaspara	42.33	50.51	33.73	16.78
Jadupur	43.66	49.77	37.14	12.63
Jalalpur	43.64	51.64	35.03	16.61
Average	43.07	50.98	34.95	16.06

Source: Census of India, 2011



The male and female worker rate is not equal among the census town in Kaliachak. The male worker is 50.29%, female is 39.06% and gender gap is 11.23%. In Bara Sujapur male worker is 51.05%, female is 29.20% and the gender gap is very high having 21.85%. The male worker is 52.12%, female is 40.36%, and gender gap is 11.76%. In Silampur, the male worker rate is 50.81%, female worker rate is 40.81% and the Gender Gap is 10%. Very high worker gender gap shows in Baliadanga and Chhoto Sujapur amounting 28.28% and 19.21% respectively. The male worker rate is 49.11%, female is and 38.26% the gender gap is 11.53%, In Nazirpur male worker rate is 50.50 %, female 33.03% and the gender gap is 17.47%. Chaspara show the

male worker rate is 50.51%, female worker rate is 33.73% and Gender gap is 16.78%. The male worker in Jadupur is 49.77%, female is 37.14 and Gender gap is 12.63%. In Jalalpur, male worker rate is 51.64%, female worker rate is 35.03% and gender gap is 16.61%.

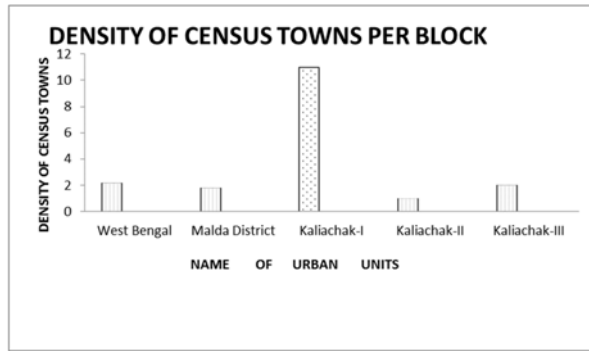
**Dimension of Concentration**

1. In the census 2001, the census town of Malda district was three only. The figure has rapidly change in the census 2011 and reached the number 27. The distribution of Census towns of Malda district is very uneven, maximum number is in Kaliachak as Non-Statutory towns. Community Development Block Kaliachak-I share 33.33% of census towns of Malda district.
2. To examine the density of census town is necessary. It helps to understand whether the more numbers or low numbers is situated.

**Density of Census towns**

Urban Units	Density of Census Towns per block
West Bengal	2.2
Malda District	1.8
Kaliachak-I	11
Kaliachak-II	1
Kaliachak-III	2

Source: Census of India, 2011 and calculated by author



3. To examine the concentration of urban population size classification of town is necessary. It helps to understand whether maximum proportion of urban population living in large or small towns. In India, urban places are classified into six size class categories - Class- I or City: Population of 100000 or above, Class-II: Population between 50000-99999, Class-III: Population between 20000-49999, Class IV: Population between 10000-19999, Class V: Population: 5000-9999, Class-VI: Population between below 5000. Alipur, Bara Sujapur, Bamangram, Silampur, Baliadanga Chhoto Sujapur, Karari Chandpur are belongs to Class IV

towns. Nazir pur, Chaspara, Jadupur, Jalalpur are belongs to Class-V towns.

4. All the census towns of Kaliachak-I emerges close to the N.H. 34 and Minority Muslim concentrated areas.

**Location Quotient analysis:** Location Quotient used to calculate characteristic Ratio of two variables of specified area. Location Quotient used to present the ratio of the total population of the whole area and the population of the specific or certain rural or urban area. Therefore, by means of the location Quotient any element, especially demographic characteristics can be depicted clearly. As all ready noted, location Quotient is the ratio of the ratio, so it has no unit. The result of the location quotient denotes the population and other elemental characteristics of that area. If the result of the location quotient becomes '1' then it can be easily reveal that the population features prevails imbalance. If the result of the LQ is less than '1' then it denotes unequal distribution of dispersed location. Similarly, if LQ result is greater than 1 then it indicate higher concentration of population of that area.

**Calculation table for location quotient:**

SL. No.	Name of the census town	Area in Sq.Km(Ai)	Ai÷A (∑Ai)	Total population (Pi) 2011	Pi÷P(∑Pi)	$LQ = \frac{P \div Pi}{A \div Ai}$
1	Alipur	1.71	0.080	17347	0.140	0.001
2	Bara Sujapur	2.40	0.113	15808	0.128	1.132
3	Bamangram	1.90	0.089	13550	0.110	1.235
4	Silampur	1.70	0.0799	12664	0.103	1.303
5	Baliadanga	3.38	0.159	12379	0.100	0.029
6	Chhoto Sujapur	0.91	0.042	11216	0.090	2.142
7	Karari Chandpur	2.40	0.113	10941	0.088	0.778
8	Nazirpur	1.96	0.095	8778	0.071	0.747
9	Chaspara	0.68	0.032	7731	0.062	1.938
10	Jadupur	1.21	0.057	7585	0.061	1.070
11	Jalalpur	3.03	0.142	5460	0.044	0.309

$\sum Ai=21.28, \sum Pi=123474$

Source: Census of India, 2011 and calculated by author

By means of the above table density of population of the 14-census town of the block of Kaliachak I are present. It is observed from the table that the LQ values of Bara Sujapur (1.132), Bamangram (1.235), Silampur (1.303), Chhoto Sujapur (2.142), Chaspara (1.938), Jadupur (1.070) census towns are greater than one (>1) which indicates high concentration. The LQ values of the rest of the census towns are less than one (<1) which denotes dispersed location of the population. LQ values of Alipur, Baliadanga, Karari Chandpur, Nazirpur, and Jalalpur are 0.001, 0.029, 0.778, 0.747 and 0.309 respectively.

**Rank size rule analysis:** The rank size rule was first observed by Auerbach in 1913 but was proposed and

popularised by G. K. Zipf in his book 'Human Behaviour and The Principle of Least Effort'. Since then, many writers have attempted to explain it but the basic aim has always remained the same: to find a graphical description to the size distribution of cities, which would apply to the situation prevailing in many countries (Siddhartha and Mukherjee, p-166).

Expected population of 1<sup>st</sup> Rank City =  $\frac{\sum \text{Population}}{\sum 1/\text{Rank}}$

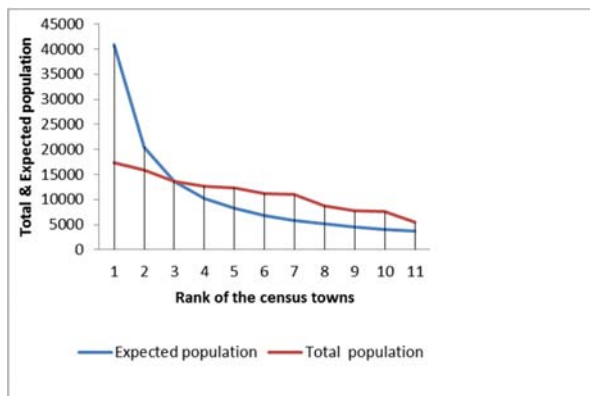
Expected population for the other Rank Cities-  
Expected population of 1<sup>st</sup> Rank City×1/Rank

(Ahmed, p-156)

Name Of Census Town	Total Population	Rank	1/Rank	Expected Population
Alipur	17347	1	1	40882
Bara Sujapur	15808	2	.5	20441
Bamangram	13550	3	.33333	13627
Silampur	12664	4	0.25	10220
Baliadanga	12379	5	0.20	8176
Chhoto Sujapur	11216	6	0.16667	6813
Karari Chandpur	10941	7	0.14285	5839
Nazirpur	8778	8	0.125	5110

Chaspara	7731	9	0.11111	4542
Jadupur	7585	10	0.10000	4088
Jalalpur	5460	11	0.09090	3716
	$\Sigma$ Population =123459		$\Sigma \frac{1}{\text{Rank}}$ =3.01986	

Source: Census of India, 2011 and calculated by author



The above figure has presented the actual population and expected population of census towns. The figure shows the rank of the census towns on the horizontal axis, the actual population and expected population have presented on the vertical axis.

The figure shows the maximum population of Alipur with Rank1 and the minimum population of Jalalpur with Rank2. The actual population are lower than expected population of the census towns of Alipur, Bara Sujapur and Bamangram. Rest of the census towns, Silampur, Baliadanga, Chhoto Sujapur, Karari Chandpur, Nazirpur, Chaspara, Jadupur and Jalalpur show the higher actual population than the expected population.

**Conclusion:** The overall analysis of the present study reveals that 11 newly towns emerged during the last decade with large no. of population, contributing significantly to the spreading up of urbanization in the study area. This has implications for not only providing urban infrastructure and civic amenities, but also child health services in the community development block Kaliachak-I. These towns have been emerged mainly in the Gangetic alluvial plain, closed of N.H. 34 and Muslim Minority Concentrated areas. Therefore, the transformation in the Gangetic alluvial plain has occurred in the economic front mainly by the changes in the secondary and tertiary.

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