

CHAPTER 6

PROBLEMS OF URBANIZATION IN NORTH BENGAL

6.1 Introduction

The process of urbanization in developing countries is associated with their own problems. The problems range from proliferation of slums, drinking water problems, housing problems, sanitation problems and urban environmental problems and pollution. With rapid urbanization taking place in most of the districts of North Bengal, the urban centres of this region are facing their own problems which are quite similar to those being faced in other parts of the country. In this chapter the main objective will be to analyze the problems related to proportion of slum households, access to safe drinking water, availability of electricity facility, availability of latrine facility, availability of bathroom within house, availability of drainage facility and availability of separate kitchen within house. All these parameters will be analyzed for individual urban centres of North Bengal for 2001 and 2011 respectively. Moreover, their change during this period will also be analyzed for individual urban centre. To analyze the change in the percentage of households without access to any facility across the urban centres of North Bengal during 2001 – 2011, only those urban centres which existed during 2001 and 2011 i.e. in both the census years have been taken into consideration. Therefore, although there were 48 urban centres in 2001 and 131 urban centres in 2011, only 47 urban centres which were common in both the census years have been taken into consideration to analyze the temporal change in their share of households without access to any facility. The decadal variation in the percentage of household without access to facility 'x' of any urban centre has been calculated by the formula as under.

$$CP_{xi} = [(P_{xiti(0+1)} - P_{xiti0}) / P_{xiti0}] * 100$$

Where,

CP_{xi} = Change in proportion of household without access to facility 'x' of urban centre i,

$P_{xiti(0+1)}$ = Percentage of household without access to facility 'x' in the later census for urban centre i,

P_{xiti0} = Percentage of household without access to facility 'x' in the earlier census for urban centre i.

In addition various environmental problems like water quality, noise level and air quality has become a huge issue in all the urban centres of India. Therefore, analysis will be done for the

pH and TDS of drinking water; noise level; PM_{2.5}, PM₁₀, TVOC (Total Volatile Organic Compounds) and HCHO (Formaldehyde) in the air to get an idea about the level of water, noise and air pollution across urban centres of North Bengal. Urban transportation has become a big problem in urban centres recently. To get an idea about the volume of the traffic survey was done, preferably at the busiest crossing of an urban centre. The issues related to water pollution, noise pollution, air pollution and traffic volume was analyzed by collecting data from primary survey done in the month of June 2018 during the busiest time of the day i.e. either between 9 a.m to 11 a.m or between 4 p.m to 7 p.m covering a range of urban centres from large to small spread across North Bengal selected randomly. For this purpose out of 131 urban centres of North Bengal, 67 urban centres were considered. The pH and TDS of water was measured with the help of digital pH Meter and TDS Meter, the noise level was measured with a digital noise meter, while the parameters related to air pollution was measured with the help of Smiledrive Portable Air Quality Pollution Meter.

Problems of urbanization have been widely studied by various people and they have identified the major problems associated with urban development accordingly. Uttara, S., Bhuvandas, N. and Aggarwal, V. (2012)¹ discussing how urbanization affects environment highlighted the issues like the creation of heat island, change in air quality, change in patterns of precipitation, change in land quality, change in flow of water, degradation of water quality, modification of habitats, slum, solid waste management and vehicular traffic. Jaysawal, N. and Saha, S. (2014)² in their study of impact assessment of urbanization in India identified the major problems of urban areas as slums, problem of garbage, sewerage problem, transport system problem, water supply problem and environmental problems. Venkatesham, V. (2015)³ discussing the problems and issues of urbanization in India said the major problems of urbanization in India are urban lounge, over crowding, housing, sanitation, squatter settlements, environmental concern, poverty, transport, unemployment, water, trash disposal and urban crime. Bholey, M. (2016)⁴ discussing the urban challenges in India identified the major issues as high population growth, affordable housing, water and sanitation and limited budgetary allocation for urban development. Sadashivam, T. and Tabassu, S. (2016)⁵ discussing the trends of urbanization in India in the 21st century identified the major problems as climate change, poverty, population growth, sanitation, slums, pollution and transportation. Morris, S. (2017)⁶ discussing the major issues of urban development in India highlighted the problems like

infrastructure deficit, water and sanitation, unclean city, electricity supply, primary health care service, chaos of transportation, unaffordable real estate, dysfunctional landuse and planning, dysfunctional growth process and urban non-governance. Shaw, A. (2017) ⁷ discussing the challenges of urbanization in India advocated the idea of a ‘humane urbanism’ which would make cities more green, equitable, efficient and people friendly. This in the Indian context can be achieved by giving common people more say in the planning of cities and improving the living condition of poor by providing them adequate water, sanitation and housing facilities.

6.2 Slum Households across Urban Centres of North Bengal

Slums are very common in urban centres of India. Slums are usually associated with lack of basic amenities and facilities and degraded housing conditions which have an adverse effect on the people residing there. According to the Census of India 2011, slums have been defined as:

1. All notified areas in a town or city notified as ‘Slum’ by State, Union Territories Administration or Local Government under any Act including a ‘Slum Act’ may be considered as Notified Slums.
2. All areas recognized as ‘Slum’ by State, Union Territories Administration or Local Government, Housing and Slum Boards, which may have not been formally notified as slum under any act may be considered as Recognized Slums.
3. A compact area of at least 300 populations or about 60-70 households of poorly built congested tenements, in unhygienic environment usually with inadequate infrastructure and lacking in proper sanitary and drinking water facilities. Such areas should be identified personally by the Charge Officer and also inspected by an officer nominated by Directorate of Census Operations. This fact must be duly recorded in the charge register. Such areas may be considered as Identified Slums.

The definition of slum adopted by Census of India remained same for 2001 and 2011. In 2001 Census slum data was collected for 640 urban centres having population of 50000 and above in 1991 Census in the first phase. However, in the second phase slum data was culled out for an additional 1103 urban centres which had less than 50000 populations in 1991, but reported more than 50000 populations in 2001. In 2011, slum data was collected for all statutory towns irrespective of their population size based on the same definition as in 2001.

Table 6.1 Percentage of Slum Household across Slum Reporting Urban Centres of North Bengal	
2001	2011

Sl. No	Urban Centre	District	In %	Sl. No	Urban Centre	District	In %
1	Raiganj	Uttar Dinajpur	42.66	1	Dalkhola	Uttar Dinajpur	100.00
2	Alipurduar	Jalpaiguri	39.79	2	Mekliganj	Koch Bihar	68.00
3	Siliguri	Darjeeling / Jpg.	37.40	3	Dinhata	Koch Bihar	66.14
4	English Bazar	Maldah	35.54	4	Haldibari	Koch Bihar	59.09
5	Balurghat	Dakshin Dinajpur	27.74	5	Islampur	Uttar Dinajpur	56.81
6	Darjeeling	Darjeeling	9.60	6	Mal	Jalpaiguri	54.15
7	Jalpaiguri	Jalpaiguri	4.79	7	Gangarampur	Dakshin Dinajpur	51.24
				8	Mirik	Darjeeling	44.89
				9	Cooch Behar	Koch Bihar	44.37
				10	Balurghat	Dakshin Dinajpur	41.48
				11	Raiganj	Uttar Dinajpur	39.98
				12	Kaliaganj	Uttar Dinajpur	39.59
				13	Old Maldah	Maldah	35.80
				14	Tufanganj	Koch Bihar	34.33
				15	English Bazar	Maldah	28.62
				16	Darjeeling	Darjeeling	24.08
				17	Kurseong	Darjeeling	23.23
				18	Siliguri	Darjeeling / Jpg.	22.82
				19	Jalpaiguri	Jalpaiguri	20.25
				20	Kalimpong	Darjeeling	8.27
				21	Alipurduar	Jalpaiguri	8.01
				22	Mathabhanga	Koch Bihar	2.40

Source: Claculated by the researcher from various Census of India publications.

Table 6.1 shows the percentage of slum households across slum reporting urban centres of North Bengal for 2001 and 2011 respectively. In 2001 only 7 urban centres from North Bengal reported slum population out of 1743 slum reporting urban centres of India. Out of these 7 urban centres reporting slums in 2001, Raiganj had the highest percentage of slum households, followed by Alipurduar, Siliguri, English Bazar, Balurghat, Darjeeling and Jalpaiguri respectively. The interesting point to note here was the urban centres of Raiganj, Alipurduar, Siliguri and English Bazar had more than 1/3rd of their total households living in slums in 2001. In Balurghat more than 1/4th of its total households lived in slums in 2001. However, in Darjeeling and Jalpaiguri very few households used to live in slums in 2001.

In 2011, 22 out of 131 urban centres of North Bengal reported slums. The highest percentage of slum households in 2011 was reported at Dalkhola, followed by Mekliganj, Dinhata, Haldibari and Islampur respectively. The lowest percentage of slum households in 2011 was reported at Mathabhanga, followed by Alipurduar, Kalimpong, Jalpaiguri and Siliguri respectively. The most important point was all the households of Dalkhola were reported living in slums in 2011. Infact, in 7 urban centres more than 50% of their total households used to live in slums while in 14 urban centres more than 33% of their total households used to live in slums. Comparing the figures for the 7 urban centres which reported slums in 2001 and 2011, it was

observed that the urban centres like Raiganj, Alipurduar, Siliguri and English Bazar which reported very high percentage of slum households in 2001 witnessed a decline in their percentage of slum households in 2011. However, the urban centres like Jalpaiguri, Darjeeling and Balurghat with relatively less percentage of slum households in 2001 saw a sharp increase in their percentage of slum households in 2011. Overall, for North Bengal the urban centres witnessed a rapid proliferation of slums in 2011 compared to 2001.

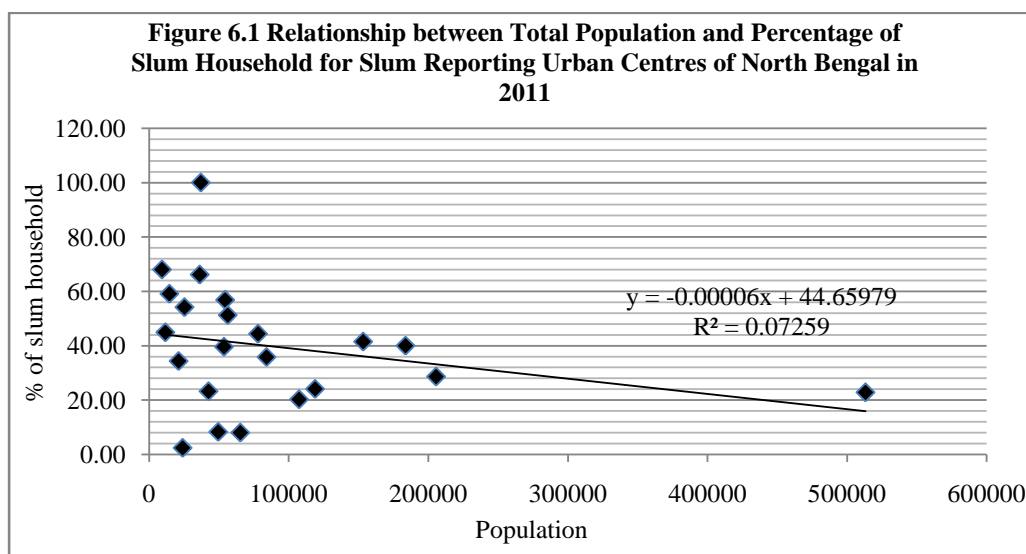


Figure 6.1 shows the relationship between total population and percentage of slum households for slum reporting urban centres of North Bengal in 2011. As seen in the figure there is a weak negative relationship between population size and percentage of slum households across the slum reporting urban centres of North Bengal in 2011. Therefore the problems of slums were more visible in the smaller urban centres compared to larger urban centres. However, the coefficient of determination calculated shows that only about 7% of variation in the percentage of slum households can be explained by variation in population size of urban centres which signifies other factors also play an important role in proliferation of slums across urban centres of North Bengal.

6.3 Households without Access to Safe Drinking Water Facility

Availability of safe drinking water is one of the primary requirements for any individual to survive. In India people drink water from various sources some of which are considered as safe while rest are considered as unsafe for consumption. Usually water from tap, handpump and tubewell or borewell is considered safe for human consumption. In this study the households

drinking water from these three sources were considered as safe while rest of the sources like well, spring, river, canal, tank, pond and lake was considered as unsafe.

Sl. No	Without Safe Drinking Water			Without Electricity		
	Urban Centre	District	In %	Urban Centre	District	In %
1	Mirik	Darjeeling	96.18	Nachhratpur Katabari	Uttar Dinajpur	73.80
2	Pattabong T.G.	Darjeeling	77.81	Bhangri P Khanda	Koch Bihar	61.96
3	Dhupguri	Jalpaiguri	75.94	Old Maldah	Maldah	59.62
4	Mal	Jalpaiguri	72.29	Sobhaganj	Jalpaiguri	54.50
5	Siliguri	Darjeeling / Jpg	68.43	Aiho	Maldah	54.20
6	Mainaguri	Jalpaiguri	67.75	Gangarampur	Dakshin Dinajpur	53.16
7	Uttar Bagdogra	Darjeeling	58.75	Mekliganj	Koch Bihar	52.50
8	Bairital	Darjeeling	56.25	Khagrabari	Koch Bihar	50.22
9	Kalimpong	Darjeeling	47.44	Guriahati	Koch Bihar	50.21
10	Mekliganj	Koch Bihar	45.19	Paschim Jitpur	Jalpaiguri	47.99
11	Darjeeling	Darjeeling	42.52	Kendua	Maldah	46.52
12	Gairkata	Jalpaiguri	35.45	Kharimala Khagrabari	Koch Bihar	45.99
13	Haldibari	Koch Bihar	32.50	Haldibari	Koch Bihar	44.61
14	Cart Road	Darjeeling	31.29	Gairkata	Jalpaiguri	44.35
15	Uttar Kamakhyaguri	Jalpaiguri	24.48	Bholar Dabri	Jalpaiguri	43.65
16	Jalpaiguri	Jalpaiguri	20.10	Dhupguri	Jalpaiguri	42.83
17	Kurseong	Darjeeling	15.18	Kasba	Uttar Dinajpur	42.52
18	Jaygaon	Jalpaiguri	7.22	Uttar Kamakhyaguri	Jalpaiguri	39.99
19	Checha Khata	Jalpaiguri	5.90	Kachu Pukur	Maldah	39.24
20	Tufanganj	Koch Bihar	4.39	Jaygaon	Jalpaiguri	38.97
21	Bhangri P Khanda	Koch Bihar	4.32	Kaliaganj	Uttar Dinajpur	38.06
22	Raiganj	Uttar Dinajpur	3.94	Dalkhola	Uttar Dinajpur	37.85
23	Alipurduar	Jalpaiguri	3.05	Mainaguri	Jalpaiguri	37.66
24	Dinhata	Koch Bihar	2.86	Uttar Latabari	Jalpaiguri	35.28
25	Kendua	Maldah	2.83	Islampur	Uttar Dinajpur	33.41
26	Mathabhanga	Koch Bihar	2.81	Falakata	Jalpaiguri	31.02
27	Guriahati	Koch Bihar	2.75	Dinhata	Koch Bihar	29.89
28	Gangarampur	Dakshin Dinajpur	2.58	Raiganj	Uttar Dinajpur	28.20
29	Khagrabari	Koch Bihar	2.37	Mal	Jalpaiguri	27.88
30	Kaliaganj	Uttar Dinajpur	2.29	Mathabhanga	Koch Bihar	27.45
31	Balurghat	Dakshin Dinajpur	2.20	Alipurduar	Jalpaiguri	27.06
32	English Bazar	Maldah	2.04	Balurghat	Dakshin Dinajpur	26.19
33	Cooch Behar	Koch Bihar	1.92	Checha Khata	Jalpaiguri	26.16
34	Kachu Pukur	Maldah	1.82	Siliguri	Darjeeling / Jpg	26.08
35	Bholar Dabri	Jalpaiguri	1.73	Tufanganj	Koch Bihar	22.93
36	Paschim Jitpur	Jalpaiguri	1.61	Cart Road	Darjeeling	22.02
37	Aiho	Maldah	1.39	English Bazar	Maldah	21.38
38	Islampur	Uttar Dinajpur	1.27	Jalpaiguri	Jalpaiguri	17.93
39	Falakata	Jalpaiguri	1.13	Cooch Behar	Koch Bihar	17.79
40	Old Maldah	Maldah	1.12	Alipurduar Rly. Jn.	Jalpaiguri	17.21
41	Kasba	Uttar Dinajpur	1.11	Banarhat T.G.	Jalpaiguri	15.68
42	Uttar Latabari	Jalpaiguri	0.81	Pattabong T.G.	Darjeeling	12.79
43	Nachhratpur Katabari	Uttar Dinajpur	0.79	Kalimpong	Darjeeling	11.10
44	Alipurduar Rly. Jn.	Jalpaiguri	0.67	Uttar Bagdogra	Darjeeling	10.39
45	Kharimala Khagrabari	Koch Bihar	0.59	Mirik	Darjeeling	9.40
46	Dalkhola	Uttar Dinajpur	0.41	Bairital	Darjeeling	9.36
47	Sobhaganj	Jalpaiguri	0.30	Darjeeling	Darjeeling	4.32

48	Banarhat T.G.	Jalpaiguri	0.00	Kurseong	Darjeeling	3.72
Source: Claculated by the researcher from various Census of India publications.						

Table 6.2 shows the percentage of households without access to safe drinking water facility across urban centres of North Bengal in 2001. As seen from the table out of 48 urban centres of North Bengal in 2001, the highest percentage of household without access to safe drinking water facility was recorded at Mirik, followed by Pattabong Tea Garden, Dhupguri, Mal and Siliguri respectively. The lowest percentage of household without access to safe drinking water facility in 2001 was recorded at Banarhat Tea Garden, followed by Sobhaganj, Dalkhola, Kharimala Khagrabari and Alipurduar Railway Junction respectively. The interesting point to note was out of 48 urban centres of North Bengal in 2001, 12 urban centres i.e. in 25.00% of total urban centres reported more than 1/3rd of their total households without access to safe drinking water facility. Looking at the spatial distribution of these 12 urban centres it was observed that 7 urban centres belongs to Darjeeling district, 4 urban centres belongs to Jalpaiguri district and 1 urban centre belong to Koch Bihar district respectively. Therefore there was overwhelming concentration of urban centres with high percentage of households without access to safe drinking water facility in the district of Darjeeling. This is obvious because the people who live in the urban centres of Darjeeling hills usually depend on springs to meet their drinking water requirement which is not considered as a safe source of drinking water facility. Another important point to note out of highest 10 urban centres with respect to percentage of households without access to safe drinking water facility in 2001, 5 were statutory towns and 5 were census towns. However, out of the lowest 10 urban centres with respect to the percentage of households without access to safe drinking water facility in 2001, only 1 was statutory town and rest of the 9 were census towns. This is interesting because normally in statutory towns the probability of getting safe drinking water is more but in North Bengal the census towns performed much better compared to statutory towns.

Table 6.3 shows the percentage of households without access to safe drinking water facility across urban centres of North Bengal in 2011. As seen from the table out of 131 urban centres of North Bengal in 2011, the highest percentage of household without access to safe drinking water facility was recorded at Chakiabhita, followed by Binnaguri, Dabgram, Laskarpara and Mirik respectively. The lowest percentage of household without access to safe drinking water facility in 2011 was recorded at Checha Khata, followed by Itahar, Sobhaganj,

Par Patiram and Dhaliabari respectively. The interesting point to note was out of 131 urban centres of North Bengal in 2011, 38 urban centres i.e. in 29.00% of total urban centres reported more than 1/3rd of their total households without access to safe drinking water facility. This percentage increased in 2011 compared to 2001 when 25% of urban centres reported more than 1/3rd of their total households without access to safe drinking water facility. Looking at the spatial distribution of these 38 urban centres it was observed that 23 urban centres belong to Darjeeling district and 15 urban centres belongs to Jalpaiguri district respectively. Therefore there was overwhelming concentration of urban centres with high percentage of households without access to safe drinking water facility in the district of Darjeeling and Jalpaiguri. This is obvious because the people who live in the urban centres of Darjeeling hills usually depend on springs to meet their drinking water requirement while in many urban centres of Jalpaiguri district water from well is commonly used for drinking water purpose both of which are not considered as a safe source of drinking water facility. Another important point to note out of highest 10 urban centres with respect to percentage of households without access to safe drinking water facility in 2011, only 1 was statutory town and 9 were census towns. However, out of the lowest 10 urban centres with respect to the percentage of households without access to safe drinking water facility in 2011, all were census towns. Therefore census towns dominate both the lower and upper end of the spectrum.

Sl. No	Without Safe Drinking Water			Without Electricity		
	Urban Centre	District	In %	Urban Centre	District	In %
1	Chakiabhita	Jalpaiguri	98.58	Birodhi	Maldah	89.10
2	Binnaguri	Jalpaiguri	91.53	Binnaguri	Jalpaiguri	72.58
3	Dabgram	Jalpaiguri	87.93	Dakshin Odlabari	Jalpaiguri	68.30
4	Laskarpara	Jalpaiguri	86.39	Krishnapur	Maldah	66.12
5	Mirik	Darjeeling	85.77	Mangalbari	Jalpaiguri	59.89
6	Dakshin Bagdogra	Darjeeling	81.64	Karari Chandpur	Maldah	56.62
7	Jitu	Darjeeling	81.54	Telipara T.G	Jalpaiguri	54.67
8	Dungra Khasmahal	Darjeeling	80.76	Milka	Maldah	52.85
9	Tari	Darjeeling	79.41	Chakiabhita	Jalpaiguri	52.55
10	Mangarjung T.G	Darjeeling	77.33	Sonatala	Maldah	51.03
11	Lalman	Darjeeling	77.09	Bagbari	Maldah	50.84
12	Chongtong T.G	Darjeeling	73.92	Jagijhora Barabak	Jalpaiguri	50.49
13	Bairatisal	Darjeeling	73.14	Jagannathpur	Maldah	49.30
14	Dakshin Rampur	Jalpaiguri	71.78	Bamangram	Maldah	49.17
15	Kharia	Jalpaiguri	71.71	Sisha-Jumrha	Jalpaiguri	49.04
16	Ging T.G	Darjeeling	71.68	Laskarpara	Jalpaiguri	47.45
17	Matialihat	Jalpaiguri	71.62	Kamat Phulbari	Koch Bihar	46.45
18	Badamtam T.G	Darjeeling	70.10	Chhatianmor	Maldah	46.39
19	Kharibari	Darjeeling	70.05	Kharia	Jalpaiguri	46.33

20	Dakshin Odlabari	Jalpaiguri	67.62	Hanskunda	Uttar Dinajpur	44.73
21	Bara Mohansingh	Darjeeling	64.23	Silampur	Maldah	44.55
22	Dakshin Khagrabari	Jalpaiguri	59.62	Odlabari	Jalpaiguri	44.35
23	Mangalbari	Jalpaiguri	58.81	Chopra	Uttar Dinajpur	44.21
24	Geni	Darjeeling	58.03	Sahapur	Maldah	43.69
25	Mainaguri	Jalpaiguri	57.81	Dakshin Khagrabari	Jalpaiguri	43.51
26	Darjeeling	Darjeeling	53.81	Dabgram	Jalpaiguri	43.24
27	Mathapari	Darjeeling	51.35	Par Patiram	Dakshin Dinajpur	42.66
28	Kalkut	Darjeeling	49.82	Bhangri P Khanda	Koch Bihar	42.17
29	Lataguri	Jalpaiguri	45.80	Sobhaganj	Jalpaiguri	41.51
30	Dumriguri	Darjeeling	44.72	Chhota Laukuthi	Koch Bihar	41.47
31	Dhupguri	Jalpaiguri	42.19	Birpara	Jalpaiguri	41.45
32	Odlabari	Jalpaiguri	40.30	Jadupur	Maldah	41.09
33	Kalimpong	Darjeeling	40.18	Mekliganj	Koch Bihar	40.90
34	Uttar Bagdogra	Darjeeling	40.08	Alipur	Maldah	40.90
35	Siliguri	Darjeeling / Jpg	37.72	Baksinagar	Maldah	40.72
36	Singtam T.G	Darjeeling	36.44	Samuktola	Jalpaiguri	39.31
37	Mal	Jalpaiguri	36.08	Jhangra	Maldah	39.05
38	Rongmook C. T.G	Darjeeling	35.71	Nachhratpur Katabari	Uttar Dinajpur	38.96
39	Bhimram	Darjeeling	32.89	Jateshwar	Jalpaiguri	38.95
40	Chalsa Mahabari	Jalpaiguri	29.48	Baisguri	Koch Bihar	38.80
41	Cart Road	Darjeeling	24.76	Dhaliabari	Koch Bihar	38.69
42	Sonada Khasmahal	Darjeeling	24.45	Dakshin Rampur	Jalpaiguri	38.05
43	Uttar Madarihat	Jalpaiguri	24.02	Kendua	Maldah	37.85
44	Rangabhita	Maldah	23.27	Lataguri	Jalpaiguri	36.49
45	Bandhail	Maldah	21.24	Chanchal	Maldah	36.32
46	Gairkata	Jalpaiguri	21.12	N. Changrabandha	Koch Bihar	36.11
47	N. Changrabandha	Koch Bihar	19.44	Gopalpur	Dakshin Dinajpur	35.83
48	Kurseong	Darjeeling	19.14	Jalalpur	Maldah	35.28
49	Jateshwar	Jalpaiguri	18.17	Dakra	Dakshin Dinajpur	34.98
50	Mekliganj	Koch Bihar	17.63	Nazirpur	Maldah	34.76
51	Haldibari	Koch Bihar	13.92	Dalkhola	Uttar Dinajpur	33.54
52	Jaygaon	Jalpaiguri	12.87	Chalsa Mahabari	Jalpaiguri	32.39
53	Sukhiapokhri	Darjeeling	12.61	Mechiabasti	Jalpaiguri	31.96
54	Bamangram	Maldah	10.82	Tekagach	Koch Bihar	31.72
55	Sonatala	Maldah	9.71	Itahar	Uttar Dinajpur	31.50
56	Silampur	Maldah	8.25	Gairkata	Jalpaiguri	30.90
57	Jalpaiguri	Jalpaiguri	6.59	Mathapari	Darjeeling	30.00
58	Kachu Pukur	Maldah	6.13	Tari	Darjeeling	29.05
59	Baliadanga	Maldah	6.11	Gangarampur	Dakshin Dinajpur	28.46
60	Shyamdhan	Darjeeling	6.05	Aiho	Maldah	28.24
61	Chhota Suzapur	Maldah	5.74	Harirampur	Dakshin Dinajpur	27.81
62	Chopra	Uttar Dinajpur	5.54	Mainaguri	Jalpaiguri	27.41
63	Jagannathpur	Maldah	5.53	Paschim Jitpur	Jalpaiguri	26.84
64	Gopalpur	Dakshin Dinajpur	5.15	Lalman	Darjeeling	26.48
65	Jalalpur	Maldah	5.04	Raiganj	Uttar Dinajpur	26.38
66	Old Maldah	Maldah	5.01	Old Maldah	Maldah	25.11
67	Milka	Maldah	4.85	Bholar Dabri	Jalpaiguri	24.94
68	Chhota Laukuthi	Koch Bihar	4.68	Kasba	Uttar Dinajpur	24.83
69	Uttar Kamakhyaguri	Jalpaiguri	4.44	Dhupguri	Jalpaiguri	24.55
70	Baksinagar	Maldah	4.42	Kaliaganj	Uttar Dinajpur	24.32
71	Jhangra	Maldah	4.29	Uttar Madarihat	Jalpaiguri	24.07
72	Birodhi	Maldah	3.93	Parangarpar	Jalpaiguri	24.04
73	Samuktola	Jalpaiguri	3.65	Chaspara	Maldah	23.55
74	Nazirpur	Maldah	3.63	Haldibari	Koch Bihar	23.27
75	Raiganj	Uttar Dinajpur	3.60	Kachu Pukur	Maldah	23.12

76	Jagijhora Barabak	Jalpaiguri	3.57	Baneswar	Koch Bihar	22.92
77	Uttar Satali	Jalpaiguri	3.51	Uttar Latabari	Jalpaiguri	22.15
78	Bagbari	Maldah	3.36	Bandhail	Maldah	22.12
79	Alipur	Maldah	3.24	Baliadanga	Maldah	22.00
80	Baneswar	Koch Bihar	2.67	Khagrabari	Koch Bihar	21.74
81	Jadupur	Maldah	2.50	Kharibari	Darjeeling	21.56
82	Dalkhola	Uttar Dinajpur	2.43	Chhota Suzapur	Maldah	20.56
83	Chakchaka	Koch Bihar	2.37	Guriahati	Koch Bihar	20.54
84	Bara Suzapur	Maldah	2.29	Dakshin Bagdogra	Darjeeling	20.09
85	Guriahati	Koch Bihar	2.19	Banarhat T.G	Jalpaiguri	20.05
86	Krishnapur	Maldah	2.19	Chongtong T.G	Darjeeling	19.67
87	Dakra	Dakshin Dinajpur	2.18	Chakchaka	Koch Bihar	19.50
88	Mechiabasti	Jalpaiguri	2.14	Chak Bhriugu	Dakshin Dinajpur	19.36
89	Banarhat T.G	Jalpaiguri	2.13	Bara Suzapur	Maldah	19.08
90	Bhangri P Khanda	Koch Bihar	2.12	Khm. Khagrabari	Koch Bihar	19.04
91	Kamat Phulbari	Koch Bihar	1.92	Uttar Kamakhyaguri	Jalpaiguri	19.00
92	Telipara T.G	Jalpaiguri	1.88	Geni	Darjeeling	18.74
93	Balurghat	Dakshin Dinajpur	1.82	Falakata	Jalpaiguri	17.81
94	English Bazar	Maldah	1.61	Jaygaon	Jalpaiguri	16.36
95	Tekagach	Koch Bihar	1.56	Kalkut	Darjeeling	16.17
96	Nachhratpur Katabari	Uttar Dinajpur	1.55	Checha Khata	Jalpaiguri	15.15
97	Falakata	Jalpaiguri	1.54	Shyamdhan	Darjeeling	15.03
98	Kendua	Maldah	1.51	Uttar Satali	Jalpaiguri	14.04
99	Chanchal	Maldah	1.44	Balurghat	Dakshin Dinajpur	13.64
100	Hanskunda	Uttar Dinajpur	1.43	Bhimram	Darjeeling	13.20
101	Mathabhanga	Koch Bihar	1.39	Matialihat	Jalpaiguri	13.19
102	Gangarampur	Dakshin Dinajpur	1.39	Mal	Jalpaiguri	12.81
103	Sahapur	Maldah	1.37	Islampur	Uttar Dinajpur	12.48
104	Sisha-Jumrha	Jalpaiguri	1.34	Rangabhita	Maldah	12.41
105	Chaspara	Maldah	1.32	Mathabhanga	Koch Bihar	12.00
106	Islampur	Uttar Dinajpur	1.13	Jalpaiguri	Jalpaiguri	11.69
107	Parangarpar	Jalpaiguri	1.07	Dumriguri	Darjeeling	11.59
108	Alipurduar	Jalpaiguri	1.04	Singtam T.G	Darjeeling	11.36
109	Karari Chandpur	Maldah	1.03	English Bazar	Maldah	10.81
110	Baisguri	Koch Bihar	1.01	Alipurduar	Jalpaiguri	10.57
111	Paschim Jitpur	Jalpaiguri	0.99	Alipurduar Rly. Jn.	Jalpaiguri	10.31
112	Dinhata	Koch Bihar	0.99	Dinhata	Koch Bihar	9.81
113	Kasba	Uttar Dinajpur	0.99	Jitu	Darjeeling	9.62
114	Chhatianmor	Maldah	0.92	Uttar Bagdogra	Darjeeling	9.27
115	Kaliaganj	Uttar Dinajpur	0.92	Rongmook C. T.G	Darjeeling	8.76
116	Cooch Behar	Koch Bihar	0.83	Mangarjung T.G	Darjeeling	8.55
117	Tufanganj	Koch Bihar	0.77	Siliguri	Darjeeling / Jpg	8.24
118	Harirampur	Dakshin Dinajpur	0.74	Cooch Behar	Koch Bihar	8.19
119	Birpara	Jalpaiguri	0.71	Cart Road	Darjeeling	8.04
120	Uttar Latabari	Jalpaiguri	0.67	Dungra Khasmahal	Darjeeling	7.29
121	Khm. Khagrabari	Koch Bihar	0.62	Bara Mohansingh	Darjeeling	7.19
122	Bholar Dabri	Jalpaiguri	0.59	Tufanganj	Koch Bihar	6.83
123	Khagrabari	Koch Bihar	0.50	Ging Tea Garden	Darjeeling	6.69
124	Aiho	Maldah	0.48	Badamtam T.G	Darjeeling	5.87
125	Chak Bhriugu	Dakshin Dinajpur	0.43	Bairatisal	Darjeeling	4.10
126	Alipurduar Rly. Jn.	Jalpaiguri	0.33	Mirik	Darjeeling	3.81
127	Dhaliabari	Koch Bihar	0.28	Kalimpong	Darjeeling	3.79
128	Par Patiram	Dakshin Dinajpur	0.27	Sonada Khasmahal	Darjeeling	3.77
129	Sobhaganj	Jalpaiguri	0.15	Sukhiapokhri	Darjeeling	3.28
130	Itahar	Uttar Dinajpur	0.14	Kurseong	Darjeeling	3.19
131	Checha Khata	Jalpaiguri	0.00	Darjeeling	Darjeeling	2.58

Source: Claculated by the researcher from various Census of India publications.

Table 6.4 shows the percentage change in proportion of household without access to safe drinking water facility across urban centres of North Bengal during 2001 – 2011. During 2001 – 2011, Checha Khata recorded the highest decrease in the share of household without access to safe drinking water facility, followed by Tufanganj, Uttar Kamakhyaguri, Khagrabari and Jalpaiguri respectively. The highest increase in the share of household without access to safe drinking water facility during 2001 – 2011 was recorded at Dalkhola, followed by Old Maldah, Kachu Pukur, Nachhratpur Katabari and Jaygaon respectively. The important point to note, out of 47 urban centres taken into consideration, 36 urban centres i.e 76.60% of urban centres recorded a decline in their share of households without access to safe drinking water facility in 2011 compared to 2001 resulting in a negative change recorded during 2001 – 2011.

Sl. No	Change in Proportion of Household without Access to Safe Drinking Water			Change in Proportion of Household without Availability of Electricity Facility		
	Urban Centre	District	In %	Urban Centre	District	In %
1	Checha Khata	Jalpaiguri	-100.00	Tufanganj	Koch Bihar	-70.22
2	Tufanganj	Koch Bihar	-82.37	Siliguri	Darjeeling / Jpg	-68.38
3	Uttar Kamakhyaguri	Jalpaiguri	-81.86	Dinhata	Koch Bihar	-67.20
4	Khagrabari	Koch Bihar	-79.07	Kalimpong	Darjeeling	-65.88
5	Jalpaiguri	Jalpaiguri	-67.22	Cart Road	Darjeeling	-63.48
6	Alipurduar	Jalpaiguri	-65.99	Islampur	Uttar Dinajpur	-62.66
7	Bholar Dabri	Jalpaiguri	-65.90	Alipurduar	Jalpaiguri	-60.93
8	Dinhata	Koch Bihar	-65.42	Mirik	Darjeeling	-59.43
9	Aiho	Maldah	-65.09	Guriahati	Koch Bihar	-59.09
10	Mekliganj	Koch Bihar	-60.98	Khm. Khagrabari	Koch Bihar	-58.61
11	Kaliaganj	Uttar Dinajpur	-59.93	Jaygaon	Jalpaiguri	-58.00
12	Haldibari	Koch Bihar	-57.16	Old Maldah	Maldah	-57.87
13	Cooch Behar	Koch Bihar	-56.78	Khagrabari	Koch Bihar	-56.72
14	Bhangri P Khanda	Koch Bihar	-50.95	Mathabhanga	Koch Bihar	-56.27
15	Mathabhanga	Koch Bihar	-50.65	Bairital	Darjeeling	-56.27
16	Alipurduar Rly. Jn.	Jalpaiguri	-50.55	Mal	Jalpaiguri	-54.04
17	Mal	Jalpaiguri	-50.09	Cooch Behar	Koch Bihar	-53.94
18	Sobhaganj	Jalpaiguri	-48.67	Uttar Kamakhyaguri	Jalpaiguri	-52.49
19	Kendua	Maldah	-46.82	English Bazar	Maldah	-49.42
20	Gangarampur	Dakshin Dinajpur	-46.24	Balurghat	Dakshin Dinajpur	-47.91
21	Siliguri	Darjeeling / Jpg	-44.87	Aiho	Maldah	-47.90
22	Dhupguri	Jalpaiguri	-44.45	Haldibari	Koch Bihar	-47.85
23	Gairkata	Jalpaiguri	-40.43	Nachhratpur Katabari	Uttar Dinajpur	-47.20
24	Paschim Jitpur	Jalpaiguri	-38.52	Gangarampur	Dakshin Dinajpur	-46.46
25	Uttar Bagdogra	Darjeeling	-31.78	Paschim Jitpur	Jalpaiguri	-44.06
26	English Bazar	Maldah	-20.97	Bholar Dabri	Jalpaiguri	-42.85
27	Cart Road	Darjeeling	-20.87	Dhupguri	Jalpaiguri	-42.68
28	Guriahati	Koch Bihar	-20.41	Falakata	Jalpaiguri	-42.60
29	Uttar Latabari	Jalpaiguri	-17.42	Checha Khata	Jalpaiguri	-42.09
30	Balurghat	Dakshin Dinajpur	-17.23	Kasba	Uttar Dinajpur	-41.61
31	Kalimpong	Darjeeling	-15.31	Kachu Pukur	Maldah	-41.07

32	Mainaguri	Jalpaiguri	-14.67	Darjeeling	Darjeeling	-40.33
33	Islampur	Uttar Dinajpur	-10.96	Alipurduar Rly. Jn.	Jalpaiguri	-40.13
34	Kasba	Uttar Dinajpur	-10.84	Uttar Latabari	Jalpaiguri	-37.21
35	Mirik	Darjeeling	-10.83	Kaliaganj	Uttar Dinajpur	-36.09
36	Raiganj	Uttar Dinajpur	-8.64	Jalpaiguri	Jalpaiguri	-34.80
37	Khm. Khagrabari	Koch Bihar	6.02	Bhangri P Khanda	Koch Bihar	-31.94
38	Kurseong	Darjeeling	26.15	Gairkata	Jalpaiguri	-30.33
39	Darjeeling	Darjeeling	26.54	Mainaguri	Jalpaiguri	-27.22
40	Bairatisal	Darjeeling	30.01	Sobhaganj	Jalpaiguri	-23.84
41	Falakata	Jalpaiguri	36.27	Mekliganj	Koch Bihar	-22.09
42	Jaygaon	Jalpaiguri	78.22	Kendua	Maldah	-18.64
43	Nachhratpur Katabari	Uttar Dinajpur	97.33	Kurseong	Darjeeling	-14.35
44	Kachu Pukur	Maldah	237.29	Dalkhola	Uttar Dinajpur	-11.37
45	Old Maldah	Maldah	348.25	Uttar Bagdogra	Darjeeling	-10.86
46	Dalkhola	Uttar Dinajpur	496.92	Raiganj	Uttar Dinajpur	-6.47
47	Banarhat T.G	Jalpaiguri	-	Banarhat T.G	Jalpaiguri	27.86

Source: Claculated by the researcher from various Census of India publications.

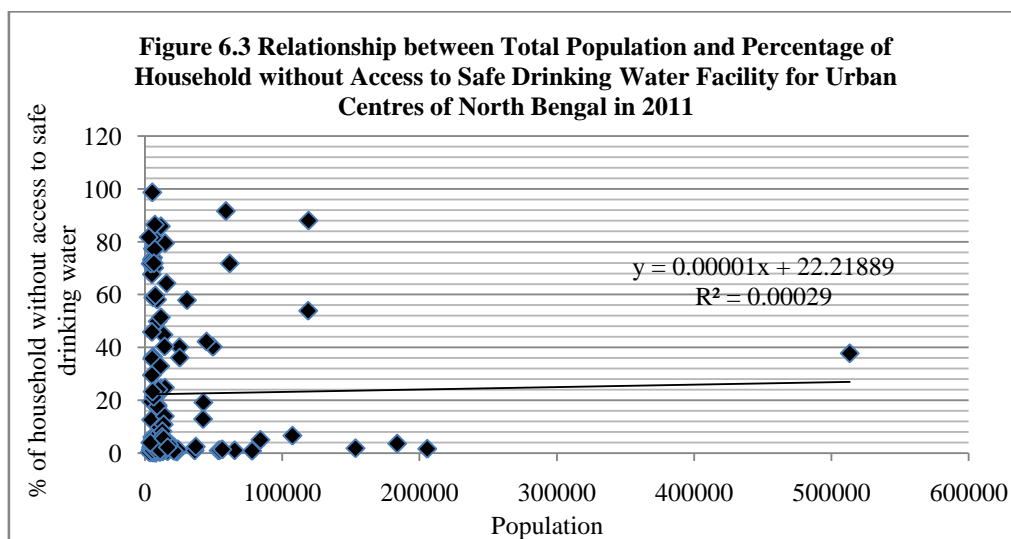
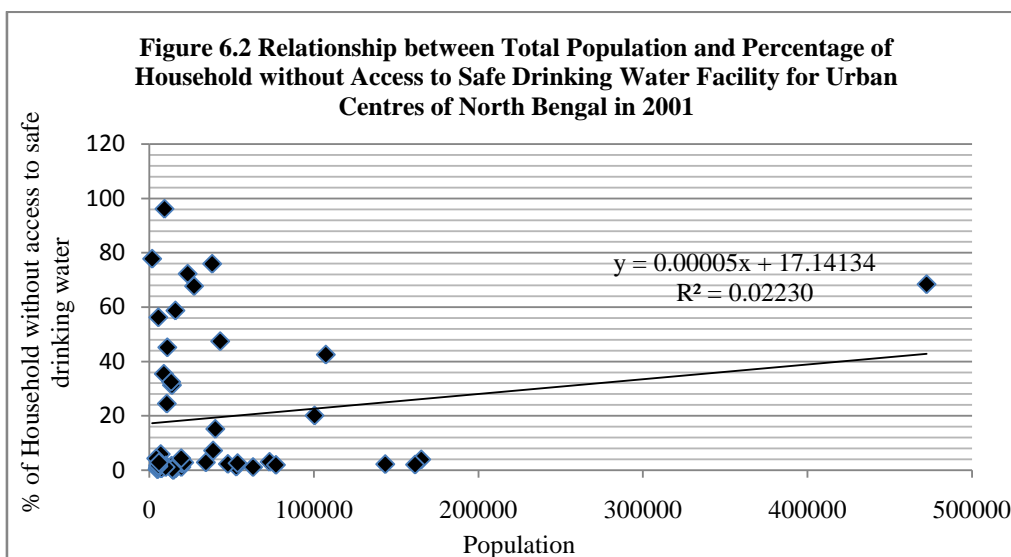


Figure 6.2 and 6.3 shows the relationship between total population and percentage of household without access to safe drinking water facility for urban centres of North Bengal in 2001 and 2011 respectively. As seen in the figures there is a very weak positive relationship between population size and percentage of households without access to safe drinking water facility across the urban centres of North Bengal in 2001. In 2011 however, the two variables seems to be independent of one another. The insignificant regression coefficient both for 2001 and 2011 validates the inference. The coefficient of determination calculated shows in 2001, only about 2% of variation in the percentage of household without access to safe drinking water facility can be explained by variation in population size of urban centres while in 2011, 0% of variation in the percentage of household without access to safe drinking water facility can be explained by variation in population size of urban centres which signifies population size of an urban centre is insignificant in determining the percentage of household having access to safe drinking water facility across urban centres of North Bengal.

6.4 Households without Availability of Electricity Facility

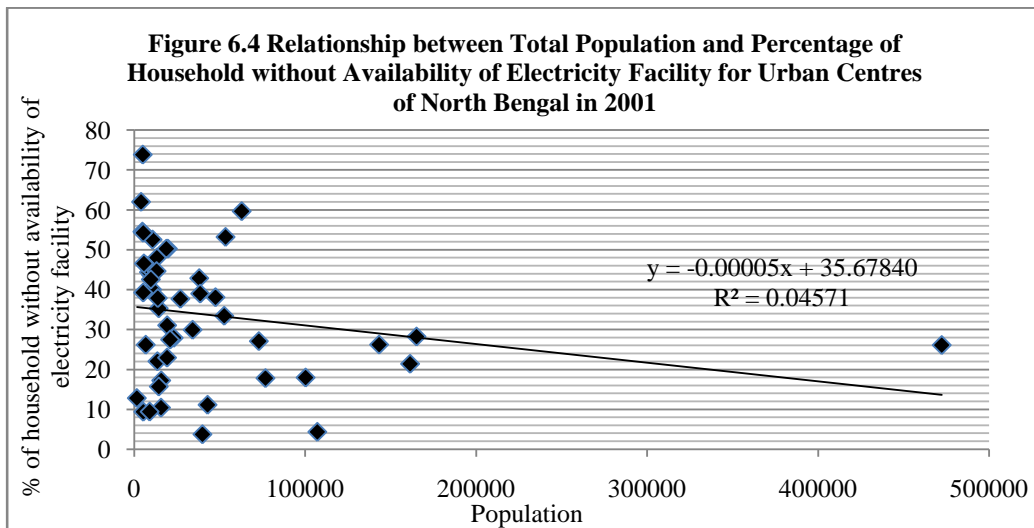
Availability of electricity facility in household is very important at present. It is not only a non-polluting source of energy but many of our household activity heavily depend on the availability electricity facility. Table 6.2 also shows the percentage of households without availability of electricity facility across urban centres of North Bengal in 2001. As seen from the table out of 48 urban centres of North Bengal in 2001, the highest percentage of household without availability of electricity facility was recorded at Nachhratpur Katabari, followed by Bhangri Pratham Khanda, Old Maldah, Sobhaganj, and Ahio respectively. The lowest percentage of household without availability of electricity facility in 2001 was recorded at Kurseong, followed by Darjeeling, Bairatisal, Mirik and Uttar Bagdogra respectively. The interesting point to note was out of 48 urban centres of North Bengal in 2001, 25 urban centres i.e. in 52.08% of total urban centres reported more than 1/3rd of their total households without availability of electricity facility. Looking at the spatial distribution of these 25 urban centres it was observed that 9 urban centres belongs to Jalpaiguri district, 6 urban centres belongs to Koch Bihar district, 5 urban centres belongs to Uttar Dinajpur district, 4 urban centres belongs to Maldah district and 1 urban centre belong to Dakshin Dinajpur district respectively. Therefore there was overwhelming concentration of urban centres with high percentage of households without

availability of electricity facility in the districts of Jalpaiguri, Koch Bihar and Uttar Dinajpur respectively. The district of Darjeeling did not have a single urban centre with more than 1/3rd of its total households without electricity facility. Another important point to note out of the highest 10 urban centres with respect to percentage of households without availability of electricity facility in 2001, 3 were statutory towns and 7 were census towns. However, out of the lowest 10 urban centres with respect to the percentage of households without availability of electricity facility in 2001, 6 were statutory towns and 4 were census towns. Thus the urban centres with the best electricity facility were mostly statutory towns and the ones with worst electricity facility were mostly census towns

Table 6.3 also shows the percentage of households without availability of electricity facility across urban centres of North Bengal in 2011. As seen from the table out of 131 urban centres of North Bengal in 2011, the highest percentage of household without availability of electricity facility was recorded at Birodhi, followed by Binnaguri, Dakshin Odlabari, Krishnapur and Mangalbari respectively. The lowest percentage of household without availability of electricity facility in 2011 was recorded at Darjeeling, followed by Kurseong, Sukhiapokhri, Sonada Khasmahal and Kalimpong respectively. The interesting point to note was out of 131 urban centres of North Bengal in 2011, 51 urban centres i.e. in 38.93% of total urban centres reported more than 1/3rd of their total households without availability of electricity facility. This percentage decreased considerably in 2011 compared to 2001 when 52.08% of urban centres reported more than 1/3rd of their total households without availability of electricity facility. Looking at the spatial distribution of these 51 urban centres it was observed that 19 urban centres belongs to Maldah district, 18 urban centres belongs to Jalpaiguri district, 7 urban centres belongs to Koch Bihar district, 4 urban centres belongs to Uttar Dinajpur district and 3 urban centres belongs to Dakshin Dinajpur district respectively. Therefore there was overwhelming concentration of urban centres with high percentage of households without availability of electricity facility in the district of Maldah and Jalpaiguri. Again like 2001 in 2011 also the district of Darjeeling did not have a single urban centre with more than 1/3rd of its total households without electricity facility. Another important point to note out of highest 10 urban centres with respect to percentage of households without availability of electricity facility in 2011, all were census towns. However, out of the lowest 10 urban centres with respect to the percentage of households without availability of electricity facility in 2011, 5 were statutory

towns and 5 were census towns. Thus like 2001, in 2011 also the urban centres with the best electricity facility were mostly statutory towns and the ones with worst electricity facility were mostly census towns. Moreover, both in 2001 and 2011 the urban centres which recorded a low percentage of households without availability of electricity facility were mostly located in the district of Darleeling signifying a relatively better condition of electricity facility in majority of urban centres of the district compared to rest of North Bengal.

Table 6.4 also shows the percentage change in proportion of household without availability of electricity facility across urban centres of North Bengal during 2001 – 2011. During 2001 – 2011, Tufanganj recorded the highest decrease in the share of household without availability of electricity facility, followed by Siliguri, Dinhata, Kalimpong and Cart Road respectively. Banarhat Tea Garden was the only urban centre which recorded an increase in its share of household without availability of electricity facility during 2001 – 2011. The important point to note, out of 47 urban centres taken into consideration, 46 urban centres i.e 97.87% of urban centres recorded a decline in their share of households without availability of electricity facility in 2011 compared to 2001 resulting in a negative change recorded during 2001 – 2011.



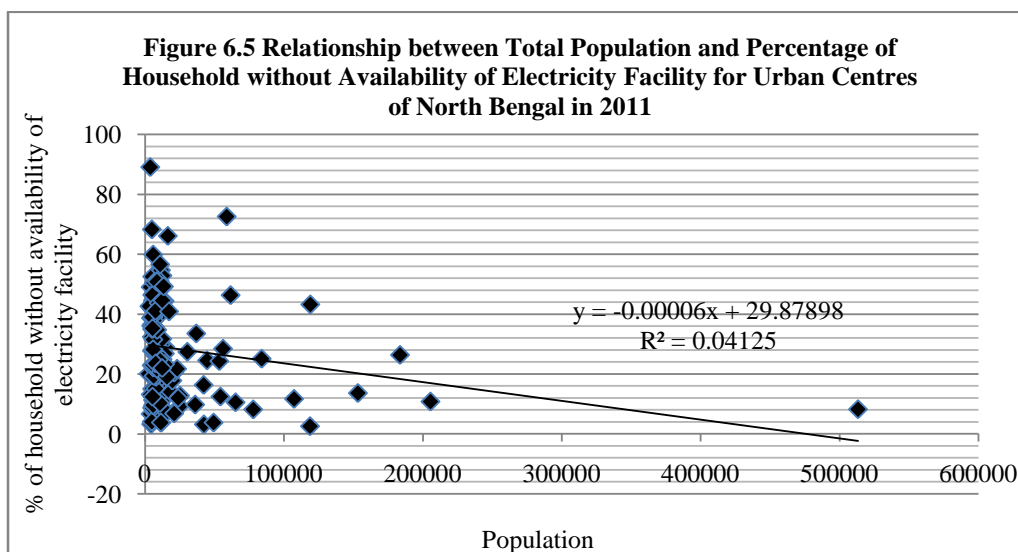


Figure 6.4 and 6.5 shows the relationship between total population and percentage of household without availability of electricity facility for urban centres of North Bengal in 2001 and 2011 respectively. As seen in the figures there is a very weak negative relationship between population size and percentage of households without availability of electricity facility across the urban centres of North Bengal in 2001 and 2011. The insignificant regression coefficient both for 2001 and 2011 validates the inference. The coefficient of determination calculated shows both in 2001 and 2011, only about 4% of variation in the percentage of household without availability of electricity facility can be explained by variation in population size of urban centres which signifies population size of an urban centre is insignificant in determining the percentage of household having electricity facility across urban centres of North Bengal.

6.5 Households without Latrine Facility

Proper sanitation is very important to maintain health and hygiene of family members in a household. Open defecation is a big problem in urban India. Open defecation pollutes the surrounding environment and makes people vulnerable to various types of disease and illness. Availability of latrine facility within households can solve this problem of open defecation to a great extent. Table 6.5 shows the percentage of households without latrine facility across urban centres of North Bengal in 2001. As seen from the table out of 48 urban centres of North Bengal in 2001, the highest percentage of household without latrine facility was recorded at Kendua, followed by Sobhaganj, Gairkata, Banarhat Tea Garden and Kachu Pukur respectively. The lowest percentage of household without latrine facility in 2001 was recorded at Mirik, followed

by Pattabong Tea Garden, Tufanganj, Alipurduar Railway Junction and Cooch Behar respectively. The interesting point to note was out of 48 urban centres of North Bengal in 2001, 17 urban centres i.e. in 35.42% of total urban centres reported more than 1/4th of their total households without latrine facility. Looking at the spatial distribution of these 17 urban centres it was observed that 7 urban centres belongs to Jalpaiguri district, 3 urban centres each belongs to Darjeeling and Maldah district and 2 urban centres each belongs to Koch Bihar and Uttar Dinajpur district respectively. Therefore there was overwhelming concentration of urban centres with high percentage of households without latrine facility in the district of Jalpaiguri. The district of Dakshin Dinajpur did not have a single urban centre with more than 1/4th of its total households without latrine facility. Another important point to note out of the highest 10 urban centres with respect to percentage of households without latrine facility in 2001, all of them were census towns. However, out of the lowest 10 urban centres with respect to the percentage of households without latrine facility in 2001, 7 were statutory towns and 3 were census towns. Thus the urban centres with the best latrine facility were mostly statutory towns and the ones with worst latrine facility were mostly census towns.

Sl. No	Without Latrine Facility			Without Bathroom within House		
	Urban Centre	District	In %	Urban Centre	District	In %
1	Kendua	Maldah	41.75	Pattabong T.G	Darjeeling	86.68
2	Sobhaganj	Jalpaiguri	32.54	Nachhratpur Katabari	Uttar Dinajpur	84.20
3	Gairkata	Jalpaiguri	32.25	Aiho	Maldah	79.74
4	Banarhat T.G	Jalpaiguri	31.93	Sobhaganj	Jalpaiguri	77.84
5	Kachu Pukur	Maldah	31.70	Kendua	Maldah	77.51
6	Dalkhola	Uttar Dinajpur	31.61	Bhangri P Khanda	Koch Bihar	76.66
7	Cart Road	Darjeeling	31.39	Cart Road	Darjeeling	73.46
8	Aiho	Maldah	31.34	Gangarampur	Dakshin Dinajpur	72.34
9	Paschim Jitpur	Jalpaiguri	30.07	Old Maldah	Maldah	69.08
10	Nachhratpur Katabari	Uttar Dinajpur	29.24	Guriahati	Koch Bihar	66.16
11	Darjeeling	Darjeeling	28.74	Paschim Jitpur	Jalpaiguri	64.02
12	Bhangri P Khanda	Koch Bihar	28.35	Kharimala Khagrabari	Koch Bihar	63.54
13	Uttar Latabari	Jalpaiguri	27.85	Kalimpong	Darjeeling	60.67
14	Kalimpong	Darjeeling	27.72	Khagrabari	Koch Bihar	60.11
15	Mainaguri	Jalpaiguri	27.58	Mekliganj	Koch Bihar	60.05
16	Haldibari	Koch Bihar	26.39	Haldibari	Koch Bihar	58.39
17	Dhuppuri	Jalpaiguri	25.82	Banarhat T.G	Jalpaiguri	58.39
18	Jaygaon	Jalpaiguri	24.37	Bholar Dabri	Jalpaiguri	56.93
19	Uttar Kamakhyaguri	Jalpaiguri	23.84	Kaliaganj	Uttar Dinajpur	56.90
20	Old Maldah	Maldah	23.24	Kasba	Uttar Dinajpur	56.03
21	Bholar Dabri	Jalpaiguri	21.32	Dalkhola	Uttar Dinajpur	55.67
22	Gangarampur	Dakshin Dinajpur	20.81	Islampur	Uttar Dinajpur	55.63
23	Kaliaganj	Uttar Dinajpur	20.73	Uttar Kamakhyaguri	Jalpaiguri	55.28
24	Khagrabari	Koch Bihar	20.60	Gairkata	Jalpaiguri	55.12
25	Guriahati	Koch Bihar	20.28	Falakata	Jalpaiguri	53.90

26	Islampur	Uttar Dinajpur	20.20	Dhupguri	Jalpaiguri	53.71
27	Uttar Bagdogra	Darjeeling	19.35	Mirik	Darjeeling	52.96
28	Kasba	Uttar Dinajpur	16.36	Mainaguri	Jalpaiguri	52.61
29	Mekliganj	Koch Bihar	16.32	Darjeeling	Darjeeling	52.55
30	Falakata	Jalpaiguri	16.24	Kachu Pukur	Maldah	51.77
31	Mathabhanga	Koch Bihar	15.85	Jaygaon	Jalpaiguri	50.38
32	Kurseong	Darjeeling	15.67	Uttar Latabari	Jalpaiguri	49.45
33	Checha Khata	Jalpaiguri	14.43	Dinhata	Koch Bihar	46.76
34	Alipurduar	Jalpaiguri	14.35	Mathabhanga	Koch Bihar	46.01
35	English Bazar	Maldah	13.23	Raiganj	Uttar Dinajpur	44.60
36	Mal	Jalpaiguri	12.90	Tufanganj	Koch Bihar	44.07
37	Jalpaiguri	Jalpaiguri	12.45	Alipurduar	Jalpaiguri	42.93
38	Kharimala Khagrabari	Koch Bihar	11.22	Balurghat	Dakshin Dinajpur	41.35
39	Raiganj	Uttar Dinajpur	10.69	Mal	Jalpaiguri	41.15
40	Dinhata	Koch Bihar	10.38	Kurseong	Darjeeling	40.89
41	Siliguri	Darjeeling / Jpg	9.65	Siliguri	Darjeeling / Jpg	40.72
42	Balurghat	Dakshin Dinajpur	8.90	Uttar Bagdogra	Darjeeling	37.07
43	Bairatisal	Darjeeling	8.39	Checha Khata	Jalpaiguri	34.53
44	Cooch Behar	Koch Bihar	8.02	English Bazar	Maldah	32.67
45	Alipurduar Rly. Jn.	Jalpaiguri	6.51	Cooch Behar	Koch Bihar	31.69
46	Tufanganj	Koch Bihar	5.23	Jalpaiguri	Jalpaiguri	31.64
47	Pattabong T.G	Darjeeling	2.87	Bairatisal	Darjeeling	18.73
48	Mirik	Darjeeling	2.79	Alipurduar Rly. Jn.	Jalpaiguri	15.47

Source: Claculated by the researcher from various Census of India publications.

Table 6.6 shows the percentage of households without latrine facility across urban centres of North Bengal in 2011. As seen from the table out of 131 urban centres of North Bengal in 2011, the highest percentage of household without latrine facility was recorded at Krishnapur, followed by Karari Chandpur, Birodhi, Silampur and Dakshin Odlabari respectively. The lowest percentage of household without latrine facility in 2011 was recorded at Bairatisal, followed by Tufanganj, Alipurduar Railway Junction, Balurghat and Bara Mohansingh respectively. The interesting point to note was out of 131 urban centres of North Bengal in 2011, 58 urban centres i.e. in 44.27% of total urban centres reported more than 1/4th of their total households without latrine facility. This percentage increased considerably in 2011 compared to 2001 when 35.42% of urban centres reported more than 1/4th of their total households without latrine facility. Looking at the spatial distribution of these 58 urban centres it was observed that 23 urban centres belongs to Maldah district, 18 urban centres belongs to Jalpaiguri district, 8 urban centres belongs to Darjeeling district, 4 urban centres belongs to Uttar Dinajpur district, 3 urban centres belongs to Koch Bihar district and 2 urban centres belongs to Dakshin Dinajpur district respectively. Therefore there was overwhelming concentration of urban centres with high percentage of households without latrine facility in the district of Maldah and Jalpaiguri. Another important point to note out of highest 10 urban centres with respect to percentage of households

without latrine facility in 2011, all were census towns. However, out of the lowest 10 urban centres with respect to the percentage of households without latrine facility in 2011, 5 were statutory towns and 5 were census towns. Thus like 2001, in 2011 also the urban centres with the best latrine facility were mostly statutory towns and the ones with worst latrine facility were mostly census towns.

Sl. No	Without Latrine Facility			Without Bathroom within House		
	Urban Centre	District	In %	Urban Centre	District	In %
1	Krishnapur	Maldah	74.75	Bamangram	Maldah	88.85
2	Karari Chandpur	Maldah	71.87	Baksinagar	Maldah	85.07
3	Birodhi	Maldah	70.60	Krishnapur	Maldah	83.45
4	Silampur	Maldah	68.19	Karari Chandpur	Maldah	81.94
5	Dakshin Odlabari	Jalpaiguri	62.74	Chaspara	Maldah	80.41
6	Binnaguri	Jalpaiguri	62.68	Birodhi	Maldah	77.44
7	Jadupur	Maldah	61.14	Bagbari	Maldah	76.83
8	Sonatala	Maldah	58.91	Dakshin Odlabari	Jalpaiguri	75.00
9	Jagijhora Barabak	Jalpaiguri	56.20	Aiho	Maldah	74.66
10	Milka	Maldah	55.50	Binnaguri	Jalpaiguri	73.82
11	Alipur	Maldah	54.88	Dhaliabari	Koch Bihar	73.27
12	Jalalpur	Maldah	54.82	Silampur	Maldah	73.08
13	Chakiabhita	Jalpaiguri	54.39	Kamat Phulbari	Koch Bihar	72.82
14	Telipara T.G	Jalpaiguri	54.27	Milka	Maldah	71.99
15	Jhangra	Maldah	53.40	Sonatala	Maldah	71.42
16	Sisha-Jumrha	Jalpaiguri	45.11	Kendua	Maldah	70.91
17	Singtam T.G	Darjeeling	45.06	Rongmook C. T.G	Darjeeling	70.27
18	Bamangram	Maldah	44.04	Jadupur	Maldah	69.69
19	Jagannathpur	Maldah	43.99	Mangalbari	Jalpaiguri	68.05
20	Banarhat T.G	Jalpaiguri	43.28	Alipur	Maldah	67.77
21	Bagbari	Maldah	43.14	Chakiabhita	Jalpaiguri	65.86
22	Hanskunda	Uttar Dinajpur	42.59	Badamtam T.G	Darjeeling	64.47
23	Chopra	Uttar Dinajpur	41.78	Jagijhora Barabak	Jalpaiguri	63.95
24	Nazirpur	Maldah	41.04	Jalalpur	Maldah	63.84
25	Mangalbari	Jalpaiguri	40.69	Chhota Suzapur	Maldah	63.37
26	Odlabari	Jalpaiguri	39.87	Nazirpur	Maldah	63.11
27	Dakshin Khagrabari	Jalpaiguri	38.87	Kachu Pukur	Maldah	62.73
28	Dalkhola	Uttar Dinajpur	38.47	Khariabari	Darjeeling	61.99
29	Par Patiram	Dakshin Dinajpur	38.00	Jhangra	Maldah	61.88
30	Rongmook C. T.G	Darjeeling	37.92	Sobhaganj	Jalpaiguri	61.77
31	Lataguri	Jalpaiguri	36.73	Gopalpur	Dakshin Dinajpur	60.96
32	Dhaliabari	Koch Bihar	35.05	Chongtong T.G	Darjeeling	59.46
33	Chongtong T.G	Darjeeling	34.95	Dakra	Dakshin Dinajpur	59.23
34	Gopalpur	Dakshin Dinajpur	34.80	Telipara T.G	Jalpaiguri	59.10
35	Ging T.G	Darjeeling	34.56	Bara Suzapur	Maldah	58.91
36	Sahapur	Maldah	33.87	Sahapur	Maldah	58.90
37	Badamtam T.G	Darjeeling	33.36	Birpara	Jalpaiguri	58.69
38	Chalsa Mahabari	Jalpaiguri	31.51	Tari	Darjeeling	57.48
39	Kharia	Jalpaiguri	31.33	Tekagach	Koch Bihar	57.01
40	Baliadanga	Maldah	31.01	Chhatianmor	Maldah	56.88
41	Birpara	Jalpaiguri	30.76	Singtam T.G	Darjeeling	56.58
42	N. Changrabandha	Koch Bihar	30.11	Dabgram	Jalpaiguri	56.48
43	Sobhaganj	Jalpaiguri	29.70	Laskarpara	Jalpaiguri	56.20

44	Bara Suzapur	Maldah	29.46	Gangarampur	Dakshin Dinajpur	56.14
45	Kendua	Maldah	29.23	Chopra	Uttar Dinajpur	56.12
46	Itahar	Uttar Dinajpur	29.04	Shyamdhan	Darjeeling	56.10
47	Baksinagar	Maldah	28.78	Chhota Laukuthi	Koch Bihar	55.74
48	Chaspara	Maldah	28.46	Dakshin Khagrabari	Jalpaiguri	55.43
49	Kharibari	Darjeeling	27.87	Jagannathpur	Maldah	55.42
50	Chanchal	Maldah	26.67	Chalsa Mahabari	Jalpaiguri	54.90
51	Mekliganj	Koch Bihar	26.54	Bhangri P Khanda	Koch Bihar	54.60
52	Matialihat	Jalpaiguri	26.16	Kharia	Jalpaiguri	52.32
53	Kachu Pukur	Maldah	26.04	Sisha-Jumrha	Jalpaiguri	52.21
54	Lalman	Darjeeling	25.83	Ging T.G	Darjeeling	50.39
55	Laskarpara	Jalpaiguri	25.33	Dalkhola	Uttar Dinajpur	50.29
56	Aiho	Maldah	25.15	Lalman	Darjeeling	49.77
57	Gairkata	Jalpaiguri	25.14	Samuktola	Jalpaiguri	49.68
58	Sukhiapokhri	Darjeeling	25.12	Banarhat T.G	Jalpaiguri	48.43
59	Cart Road	Darjeeling	24.24	Harirampur	Dakshin Dinajpur	48.18
60	Chhota Laukuthi	Koch Bihar	24.09	Par Patiram	Dakshin Dinajpur	47.46
61	Mathapari	Darjeeling	23.97	Old Maldah	Maldah	47.12
62	Geni	Darjeeling	23.66	Dakshin Rampur	Jalpaiguri	46.06
63	Dakra	Dakshin Dinajpur	23.50	Kasba	Uttar Dinajpur	46.04
64	Tekagach	Koch Bihar	23.26	Chakchaka	Koch Bihar	45.77
65	Mangarjung T.G	Darjeeling	23.01	Uttar Madarihat	Jalpaiguri	45.75
66	Mechiabasti	Jalpaiguri	22.91	Mekliganj	Koch Bihar	45.15
67	Uttar Madarihat	Jalpaiguri	22.59	Chanchal	Maldah	44.00
68	Nachhratpur Katabari	Uttar Dinajpur	22.39	Nachhratpur Katabari	Uttar Dinajpur	43.84
69	Kamat Phulbari	Koch Bihar	22.38	Odlabari	Jalpaiguri	43.17
70	Darjeeling	Darjeeling	21.35	Gairkata	Jalpaiguri	42.98
71	Mainaguri	Jalpaiguri	20.60	Parangarpar	Jalpaiguri	42.96
72	Bhimram	Darjeeling	20.49	Jateshwar	Jalpaiguri	42.29
73	Harirampur	Dakshin Dinajpur	20.46	N. Changrabandha	Koch Bihar	42.20
74	Chhota Suzapur	Maldah	20.04	Baliadanga	Maldah	42.16
75	Jitu	Darjeeling	18.88	Mangarjung T.G	Darjeeling	42.11
76	Kaliaganj	Uttar Dinajpur	18.88	Mathapari	Darjeeling	41.71
77	Sonada Khasmahal	Darjeeling	18.64	Cart Road	Darjeeling	41.06
78	Uttar Latabari	Jalpaiguri	17.97	Itahar	Uttar Dinajpur	39.73
79	Dakshin Rampur	Jalpaiguri	17.64	Bandhail	Maldah	39.68
80	Shyamdhan	Darjeeling	17.23	Lataguri	Jalpaiguri	39.43
81	Jateshwar	Jalpaiguri	16.94	Bholar Dabri	Jalpaiguri	38.69
82	Dabgram	Jalpaiguri	16.91	Khm. Khagrabari	Koch Bihar	36.98
83	Uttar Satali	Jalpaiguri	16.75	Guriahati	Koch Bihar	36.95
84	Chhatianmor	Maldah	16.36	Dakshin Bagdogra	Darjeeling	36.93
85	Raiganj	Uttar Dinajpur	16.32	Paschim Jitpur	Jalpaiguri	36.83
86	Haldibari	Koch Bihar	16.19	Dungra Khasmahal	Darjeeling	36.77
87	Dhupguri	Jalpaiguri	15.19	Bhimram	Darjeeling	36.57
88	Bandhail	Maldah	14.75	Uttar Latabari	Jalpaiguri	36.56
89	Paschim Jitpur	Jalpaiguri	14.34	Hanskunda	Uttar Dinajpur	35.71
90	Mal	Jalpaiguri	14.34	Sukhiapokhri	Darjeeling	35.65
91	Bholar Dabri	Jalpaiguri	13.88	Mechiabasti	Jalpaiguri	35.59
92	Samuktola	Jalpaiguri	13.27	Geni	Darjeeling	35.49
93	Baisguri	Koch Bihar	13.02	Kaliaganj	Uttar Dinajpur	35.38
94	Islampur	Uttar Dinajpur	12.61	Chak Bhrigu	Dakshin Dinajpur	34.77
95	Kalimpong	Darjeeling	12.43	Baisguri	Koch Bihar	34.07
96	Bhangri P Khanda	Koch Bihar	12.25	Kalkut	Darjeeling	31.73
97	Kurseong	Darjeeling	11.75	Falakata	Jalpaiguri	31.28
98	Gangarampur	Dakshin Dinajpur	11.53	Khagrabari	Koch Bihar	31.26
99	Baneswar	Koch Bihar	11.50	Raiganj	Uttar Dinajpur	30.94

100	Old Maldah	Maldah	11.19	Haldibari	Koch Bihar	30.23
101	Mathabhanga	Koch Bihar	10.77	Sonada Khasmahal	Darjeeling	30.18
102	Dumriguri	Darjeeling	10.66	Uttar Satali	Jalpaiguri	29.94
103	Tari	Darjeeling	10.64	Dhupguri	Jalpaiguri	29.90
104	Uttar Bagdogra	Darjeeling	10.14	Mainaguri	Jalpaiguri	29.00
105	Dakshin Bagdogra	Darjeeling	9.94	Islampur	Uttar Dinajpur	28.77
106	Parangarpar	Jalpaiguri	9.89	Alipurduar	Jalpaiguri	27.93
107	Alipurduar	Jalpaiguri	9.71	Matialihat	Jalpaiguri	27.27
108	Chakchaka	Koch Bihar	9.68	Uttar Kamakhyaguri	Jalpaiguri	26.42
109	Kasba	Uttar Dinajpur	9.64	Baneswar	Koch Bihar	25.83
110	Checha Khata	Jalpaiguri	9.01	Checha Khata	Jalpaiguri	25.39
111	Jaygaon	Jalpaiguri	8.96	Mirik	Darjeeling	24.78
112	Dungra Khasmahal	Darjeeling	8.80	Jitu	Darjeeling	24.54
113	English Bazar	Maldah	8.41	Darjeeling	Darjeeling	24.43
114	Falakata	Jalpaiguri	8.38	Mal	Jalpaiguri	23.50
115	Uttar Kamakhyaguri	Jalpaiguri	8.35	Rangabhita	Maldah	22.94
116	Chak Bhrigu	Dakshin Dinajpur	8.32	Mathabhanga	Koch Bihar	22.02
117	Khagrabari	Koch Bihar	8.05	Dumriguri	Darjeeling	21.98
118	Siliguri	Darjeeling / Jpg	6.02	Kalimpong	Darjeeling	21.53
119	Rangabhita	Maldah	5.88	Balurghat	Dakshin Dinajpur	21.38
120	Jalpaiguri	Jalpaiguri	5.85	Siliguri	Darjeeling / Jpg	17.46
121	Guriahati	Koch Bihar	5.83	English Bazar	Maldah	17.36
122	Kalkut	Darjeeling	5.66	Kurseong	Darjeeling	16.84
123	Khm. Khagrabari	Koch Bihar	5.65	Dinhata	Koch Bihar	16.54
124	Dinhata	Koch Bihar	5.62	Tufanganj	Koch Bihar	16.09
125	Mirik	Darjeeling	5.39	Uttar Bagdogra	Darjeeling	15.13
126	Cooch Behar	Koch Bihar	4.93	Jalpaiguri	Jalpaiguri	13.16
127	Bara Mohansingh	Darjeeling	4.92	Bara Mohansingh	Darjeeling	12.98
128	Balurghat	Dakshin Dinajpur	4.75	Jaygaon	Jalpaiguri	12.71
129	Alipurduar Rly. Jn.	Jalpaiguri	4.21	Cooch Behar	Koch Bihar	11.45
130	Tufanganj	Koch Bihar	2.84	Alipurduar Rly. Jn.	Jalpaiguri	9.01
131	Bairatisal	Darjeeling	2.78	Bairatisal	Darjeeling	7.13

Source: Claculated by the researcher from various Census of India publications.

Table 6.7 shows the percentage change in proportion of household without latrine facility across urban centres of North Bengal during 2001 – 2011. During 2001 – 2011, Guriahati recorded the highest decrease in the share of household without latrine facility, followed by Bairatisal, Uttar Kamakhyaguri, Jaygaon and Khagrabari respectively. The highest increase in the share of household without latrine facility during 2001 – 2011 was recorded at Mirik, followed by Mekliganj, Raiganj, Banarhat Tea Garden and Dalkhola respectively. The important point to note, out of 47 urban centres taken into consideration, 41 urban centres i.e 87.23% of urban centres recorded a decline in their share of households without latrine facility in 2011 compared to 2001 resulting in a negative change recorded during 2001 – 2011.

Table 6.7 Percentage Change in Proportion of Household without Latrine Facility and Availability of Bathroom within House across Urban Centres of North Bengal during 2001 - 2011		
Sl.	Change in Proportion of Household without Latrine Facility	Change in Proportion of Household without Availability of Bathroom within House

No	Urban Centre	District	In %	Urban Centre	District	In %
1	Guriahati	Koch Bihar	-71.27	Jaygaon	Jalpaiguri	-74.78
2	Bairatisal	Darjeeling	-66.81	Dinhata	Koch Bihar	-64.63
3	Uttar Kamakhyaguri	Jalpaiguri	-64.99	Kalimpong	Darjeeling	-64.52
4	Jaygaon	Jalpaiguri	-63.25	Cooch Behar	Koch Bihar	-63.87
5	Khagrabari	Koch Bihar	-60.89	Tufanganj	Koch Bihar	-63.49
6	Bhangri P Khanda	Koch Bihar	-56.81	Bairatisal	Darjeeling	-61.95
7	Kalimpong	Darjeeling	-55.16	Uttar Bagdogra	Darjeeling	-59.19
8	Jalpaiguri	Jalpaiguri	-52.99	Kurseong	Darjeeling	-58.82
9	Paschim Jitpur	Jalpaiguri	-52.32	Jalpaiguri	Jalpaiguri	-58.40
10	Old Maldah	Maldah	-51.85	Siliguri	Darjeeling / Jpg	-57.12
11	Khm. Khagrabari	Koch Bihar	-49.61	Darjeeling	Darjeeling	-53.52
12	Falakata	Jalpaiguri	-48.41	Mirik	Darjeeling	-53.22
13	Uttar Bagdogra	Darjeeling	-47.63	Uttar Kamakhyaguri	Jalpaiguri	-52.20
14	Balurghat	Dakshin Dinajpur	-46.65	Mathabhanga	Koch Bihar	-52.14
15	Dinhata	Koch Bihar	-45.89	Balurghat	Dakshin Dinajpur	-48.28
16	Tufanganj	Koch Bihar	-45.66	Islampur	Uttar Dinajpur	-48.28
17	Gangarampur	Dakshin Dinajpur	-44.57	Haldibari	Koch Bihar	-48.23
18	Dhupguri	Jalpaiguri	-41.17	Khagrabari	Koch Bihar	-47.99
19	Kasba	Uttar Dinajpur	-41.09	Nachhratpur Katabari	Uttar Dinajpur	-47.93
20	Haldibari	Koch Bihar	-38.67	English Bazar	Maldah	-46.87
21	Cooch Behar	Koch Bihar	-38.57	Mainaguri	Jalpaiguri	-44.89
22	Siliguri	Darjeeling / Jpg	-37.58	Dhupguri	Jalpaiguri	-44.34
23	Checha Khata	Jalpaiguri	-37.55	Guriahati	Koch Bihar	-44.14
24	Islampur	Uttar Dinajpur	-37.55	Cart Road	Darjeeling	-44.11
25	English Bazar	Maldah	-36.49	Mal	Jalpaiguri	-42.90
26	Uttar Latabari	Jalpaiguri	-35.46	Paschim Jitpur	Jalpaiguri	-42.47
27	Alipurduar Rly. Jn.	Jalpaiguri	-35.30	Falakata	Jalpaiguri	-41.97
28	Bholar Dabri	Jalpaiguri	-34.88	Khm. Khagrabari	Koch Bihar	-41.79
29	Alipurduar	Jalpaiguri	-32.33	Alipurduar Rly. Jn.	Jalpaiguri	-41.72
30	Mathabhanga	Koch Bihar	-32.05	Kaliaganj	Uttar Dinajpur	-37.83
31	Kendua	Maldah	-29.99	Alipurduar	Jalpaiguri	-34.95
32	Darjeeling	Darjeeling	-25.72	Bholar Dabri	Jalpaiguri	-32.03
33	Mainaguri	Jalpaiguri	-25.28	Old Maldah	Maldah	-31.79
34	Kurseong	Darjeeling	-24.97	Raiganj	Uttar Dinajpur	-30.64
35	Nachhratpur Katabari	Uttar Dinajpur	-23.45	Bhangri P Khanda	Koch Bihar	-28.77
36	Cart Road	Darjeeling	-22.78	Checha Khata	Jalpaiguri	-26.48
37	Gairkata	Jalpaiguri	-22.03	Uttar Latabari	Jalpaiguri	-26.05
38	Aiho	Maldah	-19.77	Mekliganj	Koch Bihar	-24.81
39	Kachu Pukur	Maldah	-17.85	Gangarampur	Dakshin Dinajpur	-22.39
40	Kaliaganj	Uttar Dinajpur	-8.92	Gairkata	Jalpaiguri	-22.02
41	Sobhaganj	Jalpaiguri	-8.72	Sobhaganj	Jalpaiguri	-20.65
42	Mal	Jalpaiguri	11.14	Kasba	Uttar Dinajpur	-17.83
43	Dalkhola	Uttar Dinajpur	21.71	Banarhat T.G	Jalpaiguri	-17.05
44	Banarhat T.G	Jalpaiguri	35.56	Dalkhola	Uttar Dinajpur	-9.66
45	Raiganj	Uttar Dinajpur	52.64	Kendua	Maldah	-8.51
46	Mekliganj	Koch Bihar	62.62	Aiho	Maldah	-6.37
47	Mirik	Darjeeling	93.28	Kachu Pukur	Maldah	21.16

Source: Claculated by the researcher from various Census of India publications.

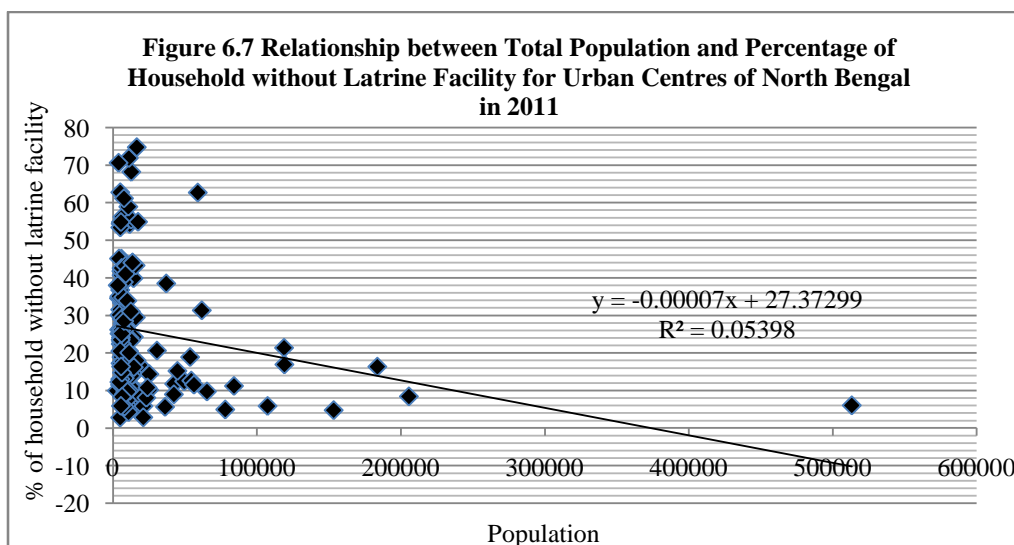
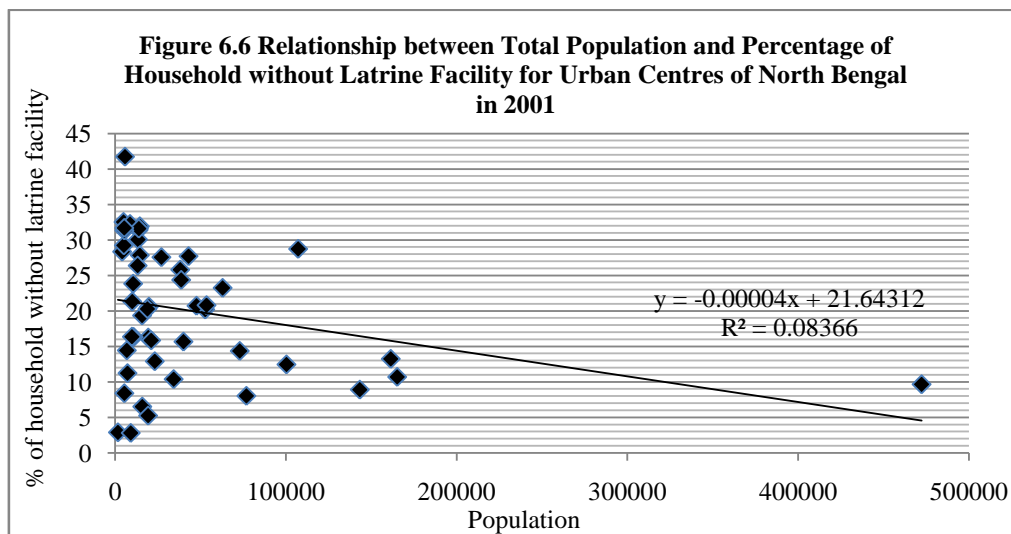


Figure 6.6 and 6.7 shows the relationship between total population and percentage of household without latrine facility for urban centres of North Bengal in 2001 and 2011 respectively. As seen in the figures there is a very weak negative relationship between population size and percentage of households without latrine facility across the urban centres of North Bengal in 2001 and 2011. The insignificant regression coefficient both for 2001 and 2011 validates the inference. The coefficient of determination calculated shows in 2001 only about 8% of variation in the percentage of household without latrine facility can be explained by variation in population size of urban centres while in 2011 only about 5% of variation in the percentage of household without latrine facility can be explained by variation in in population size of urban centres which signifies population size of an urban centre is insignificant in determining the percentage of household having latrine facility across urban centres of North Bengal.

6.6 Households without Availability of Bathroom within House

Bathroom facility within house helps in maintaining the modesty and privacy of family members especially the female members of the household. Table 6.5 also shows the percentage of household without availability of bathroom within house across urban centres of North Bengal in 2001. As seen from the table out of 48 urban centres of North Bengal in 2001, the highest percentage of household without availability of bathroom within house was recorded at Pattabong Tea Garden, followed by Nachhratpur Katabari, Aiho, Sobhaganj and Kendua respectively. The lowest percentage of household without availability of bathroom within house in 2001 was recorded at Alipurduar Railway Junction, followed by Bairatal, Jalpaiguri, Cooch Behar and English Bazar respectively. The interesting point to note was out of 48 urban centres of North Bengal in 2001, 43 urban centres i.e. in 89.58% of total urban centres reported more than 1/3rd of their total households without availability of bathroom within house. Looking at the spatial distribution of these 43 urban centres it was observed that 14 urban centres belongs to Jalpaiguri district, 9 urban centres belongs to Koch Bihar district, 8 urban centres belongs to Darjeeling district, 6 urban centres belongs to Uttar Dinajpur district, 4 urban centres belongs to Maldah district and 2 urban centres belongs to Dakshin Dinajpur district respectively. Therefore all the urban centres of Uttar Dinajpur and Dakshin Dinajpur district recorded more than 1/3rd of households without availability of bathroom within house in 2001. Another important point to note out of the highest 10 urban centres with respect to percentage of households without availability bathroom within house in 2001, 2 were statutory towns and 8 were census towns. However, out of the lowest 10 urban centres with respect to the percentage of households without availability of bathroom within house in 2001, 6 were statutory towns and 4 were census towns. Thus the urban centres with the best bathroom facility were mostly statutory towns and the ones with worst bathroom facility were mostly census towns

Table 6.6 also shows the percentage of households without availability of bathroom within house across urban centres of North Bengal in 2011. As seen from the table out of 131 urban centres of North Bengal in 2011, the highest percentage of household without availability of bathroom within house was recorded at Bamangram, followed by Bakshinagar, Krishnapur, Karari Chandpur and Chaspara respectively. The lowest percentage of household without availability of bathroom within house in 2011 was recorded at Bairatal, Alipurduar Railway Junction, Cooch Behar, Jaygaon and Bara Mohansingh respectively. The interesting point to note

was out of 131 urban centres of North Bengal in 2011, 95 urban centres i.e. in 72.51% of total urban centres reported more than 1/3rd of their total households without availability of bathroom within house. This percentage decreased considerably in 2011 compared to 2001 when 89.58% of urban centres reported more than 1/3rd of their total households without availability of bathroom within house. Looking at the spatial distribution of these 95 urban centres it was observed that 27 urban centres each belongs to Jalpaiguri and Maldah district, 17 urban centres belongs to Darjeeling district, 11 urban centres belongs to Koch Bihar district, 7 urban centres belongs to Uttar Dinajpur district and 6 urban centres belongs to Dakshin Dinajpur district respectively. Therefore there was overwhelming concentration of urban centres with high percentage of households without availability of bathroom within house in the district of Maldah and Jalpaiguri. Another important point to note out of highest 10 urban centres with respect to percentage of households without availability of bathroom within house in 2011, all were census towns. However, out of the lowest 10 urban centres with respect to the percentage of households without availability of bathroom within house in 2011, 5 were statutory towns and 5 were census towns. Thus like 2001, in 2011 also the urban centres with the best bathroom facility were mostly statutory towns and the ones with worst bathroom facility were mostly census towns.

Table 6.7 also shows the percentage change in proportion of household without availability of bathroom within house across urban centres of North Bengal during 2001 – 2011. During 2001 – 2011, Jaygaon recorded the highest decrease in the share of household without availability of bathroom within house, followed by Dinhata, Kalimpong, Cooch Behar and Tufanganj respectively. Kachu Pukur was the only urban centre which recorded an increase in its share of household without availability of bathroom within house during 2001 – 2011. The important point to note, out of 47 urban centres taken into consideration, 46 urban centres i.e. 97.87% of urban centres recorded a decline in their share of households without availability of bathroom within house in 2011 compared to 2001 resulting in a negative change recorded during 2001 – 2011.

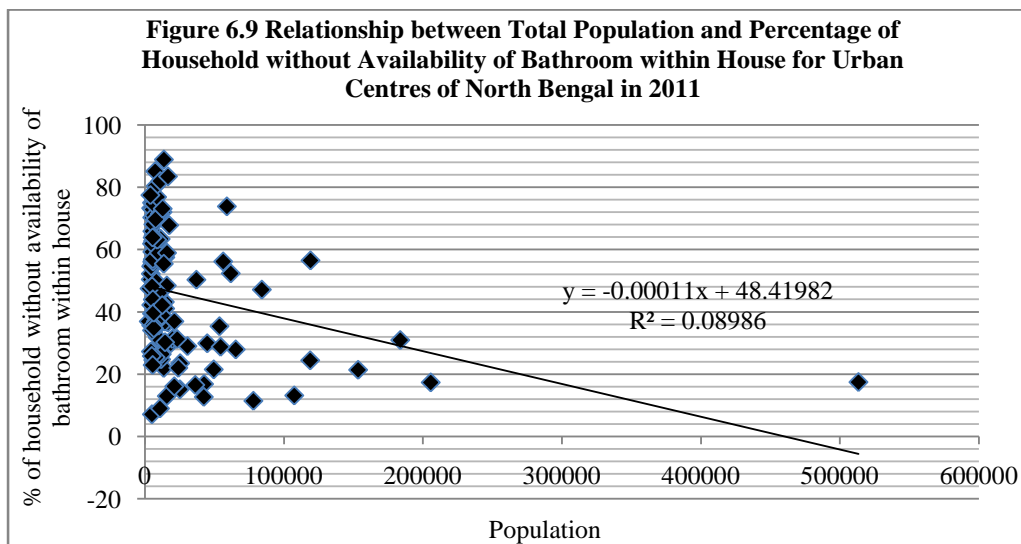
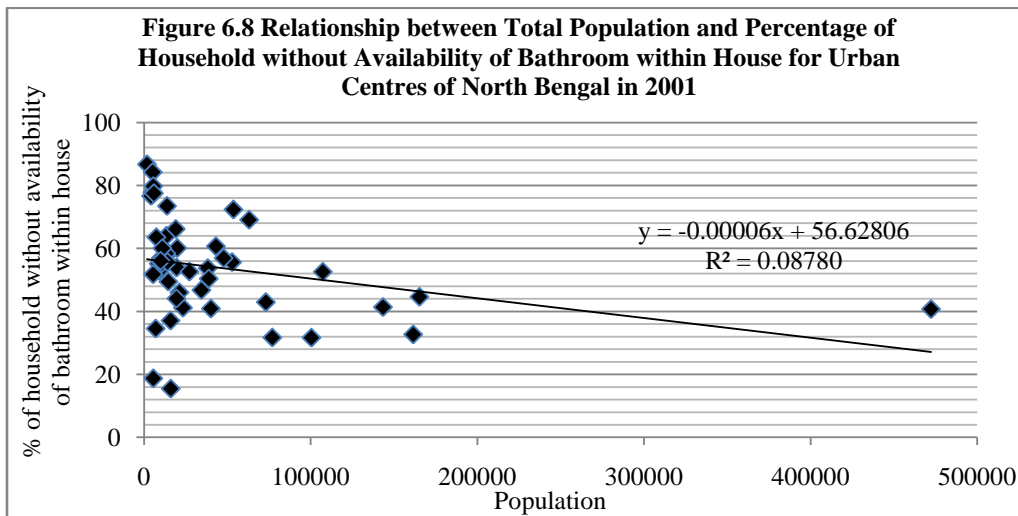


Figure 6.8 and 6.9 shows the relationship between total population and percentage of household without availability of bathroom within house for urban centres of North Bengal in 2001 and 2011 respectively. As seen in the figures there is a very weak negative relationship between population size and percentage of households without availability of bathroom within house across the urban centres of North Bengal in 2001 and 2011. The insignificant regression coefficient both for 2001 and 2011 validates the inference. The coefficient of determination calculated shows both in 2001 and 2011 only about 8% of variation in the percentage of household without availability of bathroom within house can be explained by variation in population size of urban centres which signifies population size of an urban centre was

insignificant in determining the percentage of household having bathroom within house across urban centres of North Bengal.

6.7 Households without Drainage Facility

Availability of drainage facility is another very important aspect of housing condition. Households with proper drainage facility results in systematic exit of waste water from the house. Table 6.8 shows the percentage of households without drainage facility across urban centres of North Bengal in 2001. As seen from the table out of 48 urban centres of North Bengal in 2001, the highest percentage of household without drainage facility was recorded at Nachhratpur Katabari, followed by Dalkhola, Gangarampur, Dhupguri and Uttar Kamakhyaguri respectively. The lowest percentage of household without drainage facility in 2001 was recorded at Alipurduar Railway Junction, followed by Kurseong, Darjeeling, Pattabong Tea Garden and English Bazar respectively. The interesting point to note was out of 48 urban centres of North Bengal in 2001, 41 urban centres i.e. in 85.42% of total urban centres reported more than 1/3rd of their total households without drainage facility. Looking at the spatial distribution of these 41 urban centres it was observed that 14 urban centres belongs to Jalpaiguri district, 9 urban centres belongs to Koch Bihar district, 6 urban centres each belongs to Darjeeling and Uttar Dinajpur district, 4 urban centres belongs to Maldah district and and 2 urban centres belongs to Dakshin Dinajpur district respectively. Therefore there was overwhelming concentration of urban centres with high percentage of households without drainage facility in the district of Jalpaiguri and Koch Bihar. All the urban centres in the district of Uttar Dinajpur and Dakshin Dinajpur recorded more than 1/3rd of their total households without drainage facility in 2001. Another important point to note out of the highest 10 urban centres with respect to percentage of households without drainage facility in 2001, 5 were statutory towns and 5 were census towns. However, out of the lowest 10 urban centres with respect to the percentage of households without drainage facility in 2001, 8 were statutory towns and 2 were census towns. Thus the urban centres with the best drainage facility were mostly statutory towns and the ones with worst drainage facility were mostly census towns.

Sl. No	Without Drainage Facility			Without Separate Kitchen within House		
	Urban Centre	District	In %	Urban Centre	District	In %
1	Nachhratpur Katabari	Uttar Dinajpur	99.02	Old Maldah	Maldah	51.33

2	Dalkhola	Uttar Dinajpur	88.91	Gangarampur	Dakshin Dinajpur	37.85
3	Gangarampur	Dakshin Dinajpur	88.82	Aiho	Maldah	35.93
4	Dhupguri	Jalpaiguri	86.22	Sobhaganj	Jalpaiguri	34.22
5	Uttar Kamakhyaguri	Jalpaiguri	84.26	Jaygaon	Jalpaiguri	34.06
6	Aiho	Maldah	83.81	Nachhratpur Katabari	Uttar Dinajpur	32.38
7	Kaliaganj	Uttar Dinajpur	79.69	Guriahati	Koch Bihar	31.32
8	Old Maldah	Maldah	77.44	Balurghat	Dakshin Dinajpur	31.04
9	Islampur	Uttar Dinajpur	77.00	Islampur	Uttar Dinajpur	30.55
10	Haldibari	Koch Bihar	75.92	English Bazar	Maldah	30.52
11	Kharimala Khagrabari	Koch Bihar	75.15	Siliguri	Darjeeling / Jpg	30.47
12	Kasba	Uttar Dinajpur	72.97	Dalkhola	Uttar Dinajpur	29.45
13	Guriahati	Koch Bihar	72.51	Kaliaganj	Uttar Dinajpur	28.75
14	Kendua	Maldah	72.33	Mal	Jalpaiguri	28.60
15	Kachu Pukur	Maldah	72.03	Kachu Pukur	Maldah	28.07
16	Banarhat T.G	Jalpaiguri	71.30	Gairkata	Jalpaiguri	27.61
17	Bhangri P Khanda	Koch Bihar	70.83	Uttar Bagdogra	Darjeeling	27.27
18	Mainaguri	Jalpaiguri	70.20	Kendua	Maldah	27.02
19	Khagrabari	Koch Bihar	69.09	Khagrabari	Koch Bihar	26.99
20	Paschim Jitpur	Jalpaiguri	68.22	Raiganj	Uttar Dinajpur	24.96
21	Tufanganj	Koch Bihar	68.13	Uttar Latabari	Jalpaiguri	24.39
22	Gairkata	Jalpaiguri	66.58	Mathabhanga	Koch Bihar	23.29
23	Sobhaganj	Jalpaiguri	63.20	Banarhat T.G	Jalpaiguri	22.67
24	Bholar Dabri	Jalpaiguri	62.95	Alipurduar	Jalpaiguri	20.97
25	Jaygaon	Jalpaiguri	62.16	Haldibari	Koch Bihar	20.72
26	Raiganj	Uttar Dinajpur	58.06	Mainaguri	Jalpaiguri	19.89
27	Dinhata	Koch Bihar	57.95	Jalpaiguri	Jalpaiguri	19.89
28	Uttar Bagdogra	Darjeeling	57.41	Cooch Behar	Koch Bihar	19.85
29	Mathabhanga	Koch Bihar	56.36	Dinhata	Koch Bihar	19.63
30	Uttar Latabari	Jalpaiguri	53.68	Bhangri P Khanda	Koch Bihar	19.60
31	Balurghat	Dakshin Dinajpur	53.59	Paschim Jitpur	Jalpaiguri	19.32
32	Mekliganj	Koch Bihar	52.67	Kasba	Uttar Dinajpur	18.73
33	Checha Khata	Jalpaiguri	49.68	Bholar Dabri	Jalpaiguri	17.42
34	Alipurduar	Jalpaiguri	49.44	Checha Khata	Jalpaiguri	16.19
35	Bairatal	Darjeeling	49.06	Kharimala Khagrabari	Koch Bihar	15.66
36	Falakata	Jalpaiguri	47.26	Darjeeling	Darjeeling	15.45
37	Cart Road	Darjeeling	43.33	Dhupguri	Jalpaiguri	15.41
38	Mal	Jalpaiguri	39.54	Uttar Kamakhyaguri	Jalpaiguri	14.97
39	Siliguri	Darjeeling / Jpg	38.23	Mekliganj	Koch Bihar	14.41
40	Kalimpong	Darjeeling	37.26	Bairatal	Darjeeling	14.38
41	Mirik	Darjeeling	36.62	Pattabong T.G	Darjeeling	14.36
42	Jalpaiguri	Jalpaiguri	31.82	Tufanganj	Koch Bihar	13.11
43	Cooch Behar	Koch Bihar	27.86	Kurseong	Darjeeling	12.76
44	English Bazar	Maldah	25.87	Kalimpong	Darjeeling	12.68
45	Pattabong T.G	Darjeeling	18.80	Falakata	Jalpaiguri	12.63
46	Darjeeling	Darjeeling	15.64	Cart Road	Darjeeling	9.94
47	Kurseong	Darjeeling	11.94	Alipurduar Rly. Jn.	Jalpaiguri	8.26
48	Alipurduar Rly. Jn.	Jalpaiguri	10.79	Mirik	Darjeeling	3.53

Source: Claculated by the researcher from various Census of India publications.

Table 6.9 shows the percentage of households without drainage facility across urban centres of North Bengal in 2011. As seen from the table out of 131 urban centres of North Bengal in 2011, the highest percentage of household without drainage facility was recorded at

Chakiabhita, followed by Sahapur, Bakshinagar, Kamat Phulbari and Birodhi respectively. The lowest percentage of household without drainage facility in 2011 was recorded at Kurseong, followed by Cooch Behar, Darjeeling, Alipurduar Railway Junction and Sukhiapokhri respectively. The interesting point to note was out of 131 urban centres of North Bengal in 2011, 111 urban centres i.e. in 84.73% of total urban centres reported more than 1/3rd of their total households without drainage facility. This percentage remained nearly same in 2011 compared to 2001 when 85.42% of urban centres reported more than 1/3rd of their total households without drainage facility. Looking at the spatial distribution of these 111 urban centres it was observed that 33 urban centres belongs to Jalpaiguri district, 28 urban centres belongs to Maldah district, 20 urban centres belongs to Darjeeling district, 15 urban centres belongs to Koch Bihar district, 9 urban centres belongs to Uttar Dinajpur district and 6 urban centres belongs to Dakshin Dinajpur district respectively. Therefore there was overwhelming concentration of urban centres with high percentage of households without drainage facility in the district of Jalpaiguri, Maldah and Darjeeling. Another important point to note out of highest 10 urban centres with respect to percentage of households without drainage facility in 2011, all were census towns. However, out of the lowest 10 urban centres with respect to the percentage of households without drainage facility in 2011, 6 were statutory towns and 4 were census towns. Thus like 2001, in 2011 also the urban centres with the best drainage facility were mostly statutory towns and the ones with worst drainage facility were mostly census towns.

Sl. No	Without Drainage Facility			Without Separate Kitchen within House		
	Urban Centre	District	In %	Urban Centre	District	In %
1	Chakiabhita	Jalpaiguri	98.91	Ging T.G	Darjeeling	78.26
2	Sahapur	Maldah	92.58	Mangarjung T.G	Darjeeling	76.99
3	Baksinagar	Maldah	91.76	Badamtam T.G	Darjeeling	69.13
4	Kamat Phulbari	Koch Bihar	90.99	Alipur	Maldah	68.84
5	Birodhi	Maldah	90.49	Jadupur	Maldah	68.38
6	Bagbari	Maldah	89.58	Krishnapur	Maldah	68.31
7	Dakra	Dakshin Dinajpur	88.44	Bagbari	Maldah	67.12
8	Laskarpara	Jalpaiguri	87.97	Singtam T.G	Darjeeling	66.93
9	Dakshin Odlabari	Jalpaiguri	87.45	Sonatala	Maldah	66.56
10	Dhaliabari	Koch Bihar	87.20	Karari Chandpur	Maldah	66.34
11	Bamangram	Maldah	86.82	Nazirpur	Maldah	65.94
12	Aiho	Maldah	86.27	Milka	Maldah	64.19
13	Dakshin Rampur	Jalpaiguri	85.19	Chongtong T.G	Darjeeling	64.16
14	Dakshin Khagrabari	Jalpaiguri	85.01	Chaspara	Maldah	60.52
15	Binnaguri	Jalpaiguri	84.83	Jagijhora Barabak	Jalpaiguri	56.50
16	Shyamdhan	Darjeeling	84.78	Silampur	Maldah	55.97
17	Kendua	Maldah	81.72	Jhangra	Maldah	55.92
18	Tekagach	Koch Bihar	81.51	Sisha-Jumrha	Jalpaiguri	55.47

19	Krishnapur	Maldah	80.73	Kachu Pukur	Maldah	53.03
20	N. Changrabandha	Koch Bihar	79.75	Bamangram	Maldah	51.23
21	Par Patiram	Dakshin Dinajpur	78.74	Chhatianmor	Maldah	49.83
22	Birpara	Jalpaiguri	78.57	Jalalpur	Maldah	47.39
23	Kharibari	Darjeeling	78.44	Banarhat T.G	Jalpaiguri	47.08
24	Nazirpur	Maldah	77.00	Bara Suzapur	Maldah	45.05
25	Kharia	Jalpaiguri	76.82	Chhota Suzapur	Maldah	44.88
26	Chongtong T.G	Darjeeling	76.60	Par Patiram	Dakshin Dinajpur	44.72
27	Chhatianmor	Maldah	76.34	Hanskunda	Uttar Dinajpur	44.29
28	Haldibari	Koch Bihar	76.29	Baliadanga	Maldah	43.32
29	Badamtam T.G	Darjeeling	76.29	Mirik	Darjeeling	42.98
30	Dakshin Bagdogra	Darjeeling	76.24	Sahapur	Maldah	42.94
31	Silampur	Maldah	76.12	Chakiabhita	Jalpaiguri	42.34
32	Gopalpur	Dakshin Dinajpur	75.04	Aiho	Maldah	42.26
33	Chakchaka	Koch Bihar	74.55	Mechiabasti	Jalpaiguri	42.10
34	Mechiabasti	Jalpaiguri	74.25	Gopalpur	Dakshin Dinajpur	41.61
35	Lalman	Darjeeling	74.17	Old Maldah	Maldah	41.58
36	Mangalbari	Jalpaiguri	74.14	Dhaliabari	Koch Bihar	41.40
37	Chalsa Mahabari	Jalpaiguri	74.05	Dabgram	Jalpaiguri	41.19
38	Bara Suzapur	Maldah	73.44	Kharibari	Darjeeling	41.17
39	Jalalpur	Maldah	73.12	Telipara T.G	Jalpaiguri	40.18
40	Samuktola	Jalpaiguri	72.61	Harirampur	Dakshin Dinajpur	39.69
41	Sisha-Jumrha	Jalpaiguri	72.26	Chanchal	Maldah	39.36
42	Dalkhola	Uttar Dinajpur	71.82	Odlabari	Jalpaiguri	38.65
43	Kaliaganj	Uttar Dinajpur	69.20	Cart Road	Darjeeling	38.25
44	Tari	Darjeeling	69.13	Dakshin Odlabari	Jalpaiguri	37.93
45	Sonatala	Maldah	68.67	Dakra	Dakshin Dinajpur	36.79
46	Bandhail	Maldah	68.66	N. Changrabandha	Koch Bihar	35.66
47	Jhangra	Maldah	68.50	Uttar Latabari	Jalpaiguri	34.21
48	Gangarampur	Dakshin Dinajpur	68.16	Kendua	Maldah	33.61
49	Chhota Laukuthi	Koch Bihar	67.98	Sobhaganj	Jalpaiguri	33.59
50	Alipur	Maldah	67.89	Jagannathpur	Maldah	33.53
51	Chaspara	Maldah	67.88	Binnaguri	Jalpaiguri	32.86
52	Bhangri P Khanda	Koch Bihar	67.68	Itahar	Uttar Dinajpur	32.14
53	Karari Chandpur	Maldah	67.59	Raiganj	Uttar Dinajpur	31.43
54	Milka	Maldah	67.29	Rongmook C. T.G	Darjeeling	31.37
55	Jadupur	Maldah	66.80	Paschim Jitpur	Jalpaiguri	31.22
56	Baisguri	Koch Bihar	66.27	Dungra Khasmahal	Darjeeling	30.27
57	Odlabari	Jalpaiguri	66.04	Gairkata	Jalpaiguri	30.09
58	Kachu Pukur	Maldah	65.86	Baksinagar	Maldah	29.91
59	Rangabhita	Maldah	65.63	Mangalbari	Jalpaiguri	29.80
60	Dungra Khasmahal	Darjeeling	65.59	Kaliaganj	Uttar Dinajpur	28.97
61	Telipara T.G	Jalpaiguri	65.56	Mathapari	Darjeeling	28.71
62	Kalkut	Darjeeling	65.08	Gangarampur	Dakshin Dinajpur	28.66
63	Dabgram	Jalpaiguri	65.07	Dalkhola	Uttar Dinajpur	28.03
64	Baneswar	Koch Bihar	64.67	Bhimram	Darjeeling	27.91
65	Ging T.G	Darjeeling	64.66	Bandhail	Maldah	27.06
66	Chopra	Uttar Dinajpur	64.18	Sonada Khasmahal	Darjeeling	26.49
67	Chhota Suzapur	Maldah	63.90	Guriahati	Koch Bihar	25.99
68	Bhimram	Darjeeling	62.94	Khm. Khagrabari	Koch Bihar	25.88
69	Jagannathpur	Maldah	62.50	Jaygaon	Jalpaiguri	25.82
70	Mainaguri	Jalpaiguri	61.59	Kamat Phulbari	Koch Bihar	25.78
71	Old Maldah	Maldah	61.21	Chak Bhriugu	Dakshin Dinajpur	25.59
72	Baliadanga	Maldah	60.94	Kalkut	Darjeeling	25.47
73	Uttar Madarihat	Jalpaiguri	60.90	Uttar Satali	Jalpaiguri	25.13
74	Uttar Kamakhyaguri	Jalpaiguri	60.55	Mal	Jalpaiguri	25.12

75	Gairkata	Jalpaiguri	60.07	Bhangri P Khanda	Koch Bihar	25.05
76	Mekliganj	Koch Bihar	59.93	Balurghat	Dakshin Dinajpur	24.95
77	Singtam T.G	Darjeeling	59.25	English Bazar	Maldah	24.69
78	Mathapari	Darjeeling	58.97	Matialihat	Jalpaiguri	24.50
79	Jateshwar	Jalpaiguri	58.59	Khagrabari	Koch Bihar	23.79
80	Mirik	Darjeeling	58.07	Islampur	Uttar Dinajpur	23.28
81	Hanskunda	Uttar Dinajpur	57.14	Siliguri	Darjeeling / Jpg	21.95
82	Itahar	Uttar Dinajpur	56.54	Tekagach	Koch Bihar	21.87
83	Lataguri	Jalpaiguri	56.41	Uttar Madarihat	Jalpaiguri	21.68
84	Parangarpar	Jalpaiguri	55.35	Dumriguri	Darjeeling	21.35
85	Banarhat T.G	Jalpaiguri	55.13	Tari	Darjeeling	21.28
86	Dhupguri	Jalpaiguri	54.13	Laskarpara	Jalpaiguri	20.66
87	Khagrabari	Koch Bihar	54.12	Alipurduar	Jalpaiguri	20.25
88	Harirampur	Dakshin Dinajpur	53.63	Mainaguri	Jalpaiguri	20.04
89	Chanchal	Maldah	53.50	Lalman	Darjeeling	19.86
90	Bholar Dabri	Jalpaiguri	53.36	Falakata	Jalpaiguri	19.11
91	Mangarjung T.G	Darjeeling	52.16	Kharia	Jalpaiguri	18.76
92	Islampur	Uttar Dinajpur	51.52	Birodhi	Maldah	18.63
93	Rongmook C. T.G	Darjeeling	51.52	Dakshin Bagdogra	Darjeeling	18.57
94	Geni	Darjeeling	51.31	Bholar Dabri	Jalpaiguri	18.44
95	Kasba	Uttar Dinajpur	50.77	Dakshin Khagrabari	Jalpaiguri	18.23
96	Guriahati	Koch Bihar	50.05	Samuktola	Jalpaiguri	18.10
97	Uttar Latabari	Jalpaiguri	50.00	Jitu	Darjeeling	18.03
98	Chak Bhrigu	Dakshin Dinajpur	49.45	Shyamdhan	Darjeeling	17.60
99	Nachhratpur Katabari	Uttar Dinajpur	49.03	Dakshin Rampur	Jalpaiguri	17.58
100	Khm. Khagrabari	Koch Bihar	48.34	Birpara	Jalpaiguri	17.51
101	Paschim Jitpur	Jalpaiguri	47.21	Kurseong	Darjeeling	17.23
102	Jagijhora Barabak	Jalpaiguri	46.62	Rangabhita	Maldah	17.22
103	Sobhaganj	Jalpaiguri	44.94	Mathabhanga	Koch Bihar	17.02
104	Falakata	Jalpaiguri	43.86	Haldibari	Koch Bihar	17.02
105	Bara Mohansingh	Darjeeling	42.89	Chhota Laukuthi	Koch Bihar	16.99
106	Jitu	Darjeeling	42.15	Kasba	Uttar Dinajpur	16.61
107	Raiganj	Uttar Dinajpur	40.37	Uttar Bagdogra	Darjeeling	16.48
108	Tufanganj	Koch Bihar	39.57	Chopra	Uttar Dinajpur	16.44
109	Dumriguri	Darjeeling	37.32	Kalimpong	Darjeeling	16.31
110	Uttar Satali	Jalpaiguri	34.76	Baisguri	Koch Bihar	15.72
111	Checha Khata	Jalpaiguri	33.87	Lataguri	Jalpaiguri	15.27
112	Cart Road	Darjeeling	31.49	Chalsa Mahabari	Jalpaiguri	15.18
113	Matialihat	Jalpaiguri	31.37	Geni	Darjeeling	15.00
114	Mathabhanga	Koch Bihar	31.13	Nachhratpur Katabari	Uttar Dinajpur	14.79
115	Sonada Khasmahal	Darjeeling	30.81	Jateshwar	Jalpaiguri	14.62
116	Mal	Jalpaiguri	29.81	Dinhata	Koch Bihar	14.28
117	Alipurduar	Jalpaiguri	29.40	Jalpaiguri	Jalpaiguri	14.27
118	Balurghat	Dakshin Dinajpur	28.31	Mekliganj	Koch Bihar	14.09
119	Bairital	Darjeeling	27.19	Darjeeling	Darjeeling	13.43
120	Dinhata	Koch Bihar	25.37	Checha Khata	Jalpaiguri	13.23
121	Kalimpong	Darjeeling	25.09	Dhupguri	Jalpaiguri	13.14
122	Uttar Bagdogra	Darjeeling	19.94	Uttar Kamakhyaguri	Jalpaiguri	12.07
123	Jalpaiguri	Jalpaiguri	18.26	Cooch Behar	Koch Bihar	11.51
124	Jaygaon	Jalpaiguri	17.94	Tufanganj	Koch Bihar	11.47
125	Siliguri	Darjeeling / Jpg	16.25	Chakchaka	Koch Bihar	10.84
126	English Bazar	Maldah	14.39	Parangarpar	Jalpaiguri	10.29
127	Sukhiapokhri	Darjeeling	14.30	Bara Mohansingh	Darjeeling	9.94
128	Alipurduar Rly. Jn.	Jalpaiguri	11.12	Sukhiapokhri	Darjeeling	9.43
129	Darjeeling	Darjeeling	10.78	Baneswar	Koch Bihar	9.08
130	Cooch Behar	Koch Bihar	10.27	Alipurduar Rly. Jn.	Jalpaiguri	5.28

131	Kurseong	Darjeeling	8.91	Bairatal	Darjeeling	4.26
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Source: Claculated by the researcher from various Census of India publications.

Table 6.10 shows the percentage change in proportion of household without drainage facility across urban centres of North Bengal during 2001 – 2011. During 2001 – 2011, Jaygaon recorded the highest decrease in the share of household without drainage facility, followed by Uttar Bagdogra, Cooch Behar, Siliguri and Dinhata respectively. The highest increase in the share of household without drainage facility during 2001 – 2011 was recorded at Mirik, followed by Mekliganj, Kendua, Alipurduar Railway Junction and Aiho respectively. The important point to note, out of 47 urban centres taken into consideration, 41 urban centres i.e 87.23% of urban centres recorded a decline in their share of households without drainage facility in 2011 compared to 2001 resulting in a negative change recorded during 2001 – 2011.

Sl No	Change in Proportion of Household without Drainage Facility			Change in Proportion of Household without Availability of Separate Kitchen within House		
	Urban Centre	District	In %	Urban Centre	District	In %
1	Jaygaon	Jalpaiguri	-71.14	Bairatal	Darjeeling	-70.39
2	Uttar Bagdogra	Darjeeling	-65.27	Nachhratpur Katabari	Uttar Dinajpur	-54.32
3	Cooch Behar	Koch Bihar	-63.15	Cooch Behar	Koch Bihar	-42.00
4	Siliguri	Darjeeling / Jpg	-57.49	Uttar Bagdogra	Darjeeling	-39.56
5	Dinhata	Koch Bihar	-56.23	Alipurduar Rly. Jn.	Jalpaiguri	-36.02
6	Nachhratpur Katabari	Uttar Dinajpur	-50.48	Jalpaiguri	Jalpaiguri	-28.24
7	Balurghat	Dakshin Dinajpur	-47.16	Siliguri	Darjeeling / Jpg	-27.98
8	Mathabhanga	Koch Bihar	-44.77	Dinhata	Koch Bihar	-27.24
9	Bairatal	Darjeeling	-44.58	Mathabhanga	Koch Bihar	-26.91
10	English Bazar	Maldah	-44.35	Gangarampur	Dakshin Dinajpur	-24.27
11	Jalpaiguri	Jalpaiguri	-42.63	Jaygaon	Jalpaiguri	-24.19
12	Tufanganj	Koch Bihar	-41.92	Islampur	Uttar Dinajpur	-23.79
13	Alipurduar	Jalpaiguri	-40.53	Balurghat	Dakshin Dinajpur	-19.63
14	Dhupguri	Jalpaiguri	-37.22	Uttar Kamakhyaguri	Jalpaiguri	-19.34
15	Khm. Khagrabari	Koch Bihar	-35.67	English Bazar	Maldah	-19.08
16	Islampur	Uttar Dinajpur	-33.09	Old Maldah	Maldah	-18.99
17	Kalimpong	Darjeeling	-32.68	Checha Khata	Jalpaiguri	-18.29
18	Checha Khata	Jalpaiguri	-31.83	Haldibari	Koch Bihar	-17.85
19	Darjeeling	Darjeeling	-31.06	Guriahati	Koch Bihar	-17.02
20	Guriahati	Koch Bihar	-30.97	Dhupguri	Jalpaiguri	-14.77
21	Paschim Jitpur	Jalpaiguri	-30.79	Darjeeling	Darjeeling	-13.03
22	Raiganj	Uttar Dinajpur	-30.47	Tufanganj	Koch Bihar	-12.56
23	Kasba	Uttar Dinajpur	-30.42	Mal	Jalpaiguri	-12.17
24	Sobhaganj	Jalpaiguri	-28.91	Khagrabari	Koch Bihar	-11.84
25	Uttar Kamakhyaguri	Jalpaiguri	-28.14	Kasba	Uttar Dinajpur	-11.30
26	Cart Road	Darjeeling	-27.33	Dalkhola	Uttar Dinajpur	-4.80
27	Kurseong	Darjeeling	-25.40	Alipurduar	Jalpaiguri	-3.44
28	Mal	Jalpaiguri	-24.61	Mekliganj	Koch Bihar	-2.22
29	Gangarampur	Dakshin Dinajpur	-23.26	Sobhaganj	Jalpaiguri	-1.86
30	Banarhat T.G	Jalpaiguri	-22.68	Mainaguri	Jalpaiguri	0.74
31	Khagrabari	Koch Bihar	-21.68	Kaliaganj	Uttar Dinajpur	0.75

32	Old Maldah	Maldah	-20.96	Bholar Dabri	Jalpaiguri	5.88
33	Dalkhola	Uttar Dinajpur	-19.22	Gairkata	Jalpaiguri	8.98
34	Bholar Dabri	Jalpaiguri	-15.22	Aiho	Maldah	17.62
35	Kaliaganj	Uttar Dinajpur	-13.16	Kendua	Maldah	24.37
36	Mainaguri	Jalpaiguri	-12.26	Raiganj	Uttar Dinajpur	25.89
37	Gairkata	Jalpaiguri	-9.78	Bhangri P Khanda	Koch Bihar	27.76
38	Kachu Pukur	Maldah	-8.55	Kalimpong	Darjeeling	28.63
39	Falakata	Jalpaiguri	-7.18	Kurseong	Darjeeling	35.08
40	Uttar Latabari	Jalpaiguri	-6.86	Uttar Latabari	Jalpaiguri	40.26
41	Bhangri P Khanda	Koch Bihar	-4.45	Falakata	Jalpaiguri	51.34
42	Haldibari	Koch Bihar	0.48	Paschim Jitpur	Jalpaiguri	61.61
43	Aiho	Maldah	2.93	Khm. Khagrabari	Koch Bihar	65.32
44	Alipurduar Rly. Jn.	Jalpaiguri	3.10	Kachu Pukur	Maldah	88.94
45	Kendua	Maldah	12.99	Banarhat T.G	Jalpaiguri	107.69
46	Mekliganj	Koch Bihar	13.79	Cart Road	Darjeeling	284.63
47	Mirik	Darjeeling	58.59	Mirik	Darjeeling	1117.43

Source: Claculated by the researcher from various Census of India publications.

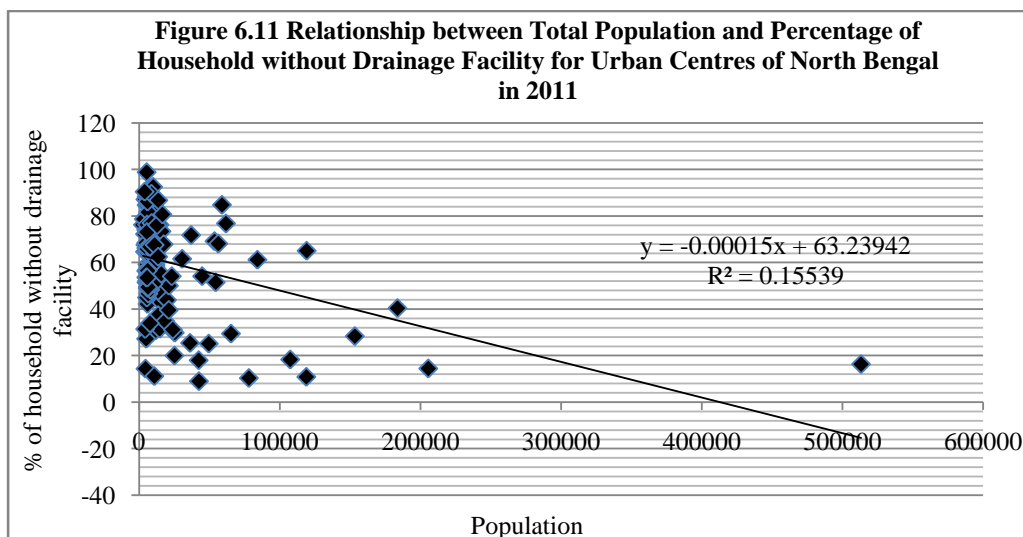
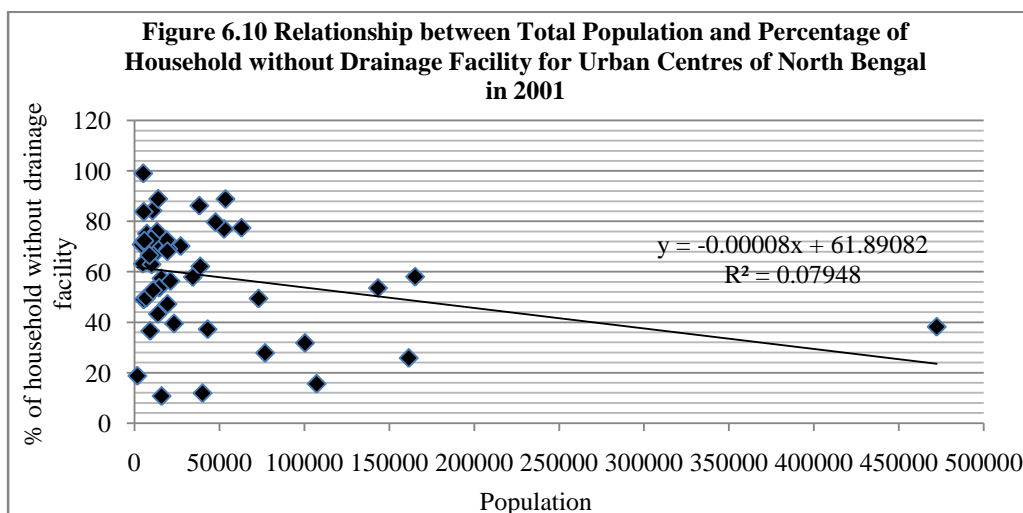


Figure 6.10 and 6.11 shows the relationship between total population and percentage of household without drainage facility for urban centres of North Bengal in 2001 and 2011 respectively. As seen in the figures there is a very weak negative relationship between population size and percentage of households without drainage facility across the urban centres of North Bengal in 2001 and 2011. The insignificant regression coefficient both for 2001 and 2011 validates the inference. The coefficient of determination calculated shows in 2001 only about 7% of variation in the percentage of household without drainage facility can be explained by variation in population size of urban centres while in 2011 about 15% of variation in the percentage of household without drainage facility can be explained by variation in in population size of urban centres which signifies population size of an urban centre was insignificant in determining the percentage of household having drainage facility across urban centres of North Bengal in 2001 but in 2011, population size of an urban centre significantly impacted the drainage facility across urban centres of North Bengal.

6.8 Households without Availability of Separate Kitchen within house

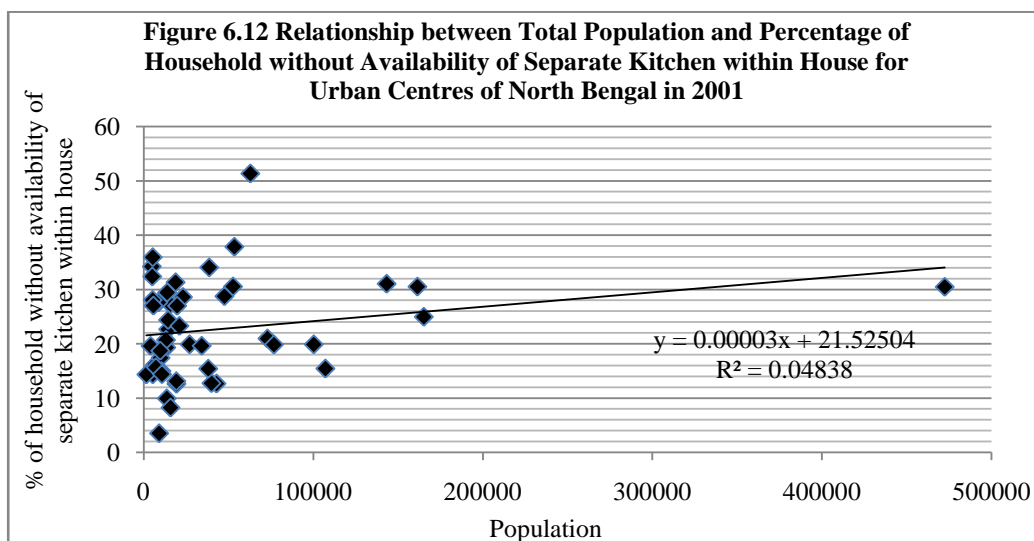
Availability of separate kitchen in households affects the living condition of the family members to a great extent. When separate kitchen is not available the cooking is usually done inside the bed room which affects the health of the family members because the poor people without separate kitchen do not have access to LPG and mostly use firewood or charcoal as fuel used for cooking. Table 6.8 also shows the percentage of households without availability of separate kitchen within house across urban centres of North Bengal in 2001. As seen from the table out of 48 urban centres of North Bengal in 2001, the highest percentage of household without availability of separate kitchen within house was recorded at Old Maldah, followed by Gangarampur, Aiho, Sobhaganj and Jaygaon respectively. The lowest percentage of household without availability of separate kitchen within house in 2001 was recorded at Mirik, followed by Alipurduar Railway Junction, Cart Road, Falakata and Kalimpong respectively. The interesting point to note was out of 48 urban centres of North Bengal in 2001, 19 urban centres i.e. in 39.58% of total urban centres reported more than 1/4th of their total households without availability of separate kitchen within house. Looking at the spatial distribution of these 19 urban centres it was observed that 5 urban centres belongs to Maldah district, 4 urban centres each belongs to Jalpaiguri and Uttar Dinajpur district and 2 urban centres each belongs to Darjeeling,

Koch Bihar and Dakshin Dinajpur district respectively. Therefore there was concentration of urban centres with high percentage of households without availability of separate kitchen within house in the district of Maldah, Jalpaiguri and Uttar Dinajpur. All the urban centres in the district of Maldah and Dakshin Dinajpur recorded more than 1/4th of their total households without availability of separate kitchen within house in 2001. Another important point to note out of the highest 10 urban centres with respect to percentage of households without availability of separate kitchen within house in 2001, 5 were statutory towns and 5 were census towns. However, out of the lowest 10 urban centres with respect to the percentage of households without availability of separate kitchen within house in 2001, 5 were statutory towns and 5 were census towns. Thus the urban centres with the best separate kitchen facility and the ones with the worst separate kitchen facility were from both statutory towns and census towns.

Table 6.9 also shows the percentage of households without availability of separate kitchen within house across urban centres of North Bengal in 2011. As seen from the table out of 131 urban centres of North Bengal in 2011, the highest percentage of household without availability of separate kitchen within house was recorded at Ging Tea Garden, followed by Mangarjung Tea Garden, Badamtam Tea Garden, Alipur and Jadupur respectively. The lowest percentage of household without availability of separate kitchen within house in 2011 was recorded at Bairatisal, followed by Alipurduar Railway Junction, Baneswar, Sukhiapokhri and Bara Mohansingh respectively. The interesting point to note was out of 131 urban centres of North Bengal in 2011, 75 urban centres i.e. in 57.25% of total urban centres reported more than 1/4th of their total households without availability of separate kitchen within house. This percentage increased in 2011 compared to 2001 when 40% of urban centres reported more than 1/4th of their total households without availability of separate kitchen within house. Looking at the spatial distribution of these 75 urban centres it was observed that 26 urban centres belongs to Maldah district, 18 urban centres belongs to Jalpaiguri district, 14 urban centres belongs to Darjeeling district, 6 urban centres each belongs to Koch Bihar and Dakshin Dinajpur district and 5 urban centres belongs to Uttar Dinajpur district respectively. Therefore there was an overwhelming concentration of urban centres with high percentage of households without availability of separate kitchen within house in the district of Maldah, Jalpaiguri and Darjeeling. Another important point to note out of highest 10 urban centres with respect to percentage of households without availability of separate kitchen within house in 2011, all were census towns.

However, out of the lowest 10 urban centres with respect to the percentage of households without availability of separate kitchen within house in 2011, 2 were statutory towns and 8 were census towns. Thus like 2001, in 2011 also the urban centres with the best separate kitchen facility and the ones with worst separate kitchen facility were from both statutory towns and census towns.

Table 6.10 also shows the percentage change in proportion of household without separate kitchen across urban centres of North Bengal during 2001 – 2011. During 2001 – 2011, Bairatal recorded the highest decrease in the share of household without separate kitchen, followed by Nachhratpur Katabari, Cooch Behar, Uttar Bagdogra and Alipurduar Railway Junction respectively. The highest increase in the share of household without separate kitchen during 2001 – 2011 was recorded at Mirik, followed by Cart Road, Banarhat Tea Garden, Kachu Pukur and Kharimala Khagrabari respectively. The important point to note, out of 47 urban centres taken into consideration, 29 urban centres i.e 61.70% of urban centres recorded a decline in their share of households without separate kitchen in 2011 compared to 2001 resulting in a negative change recorded during 2001 – 2011.



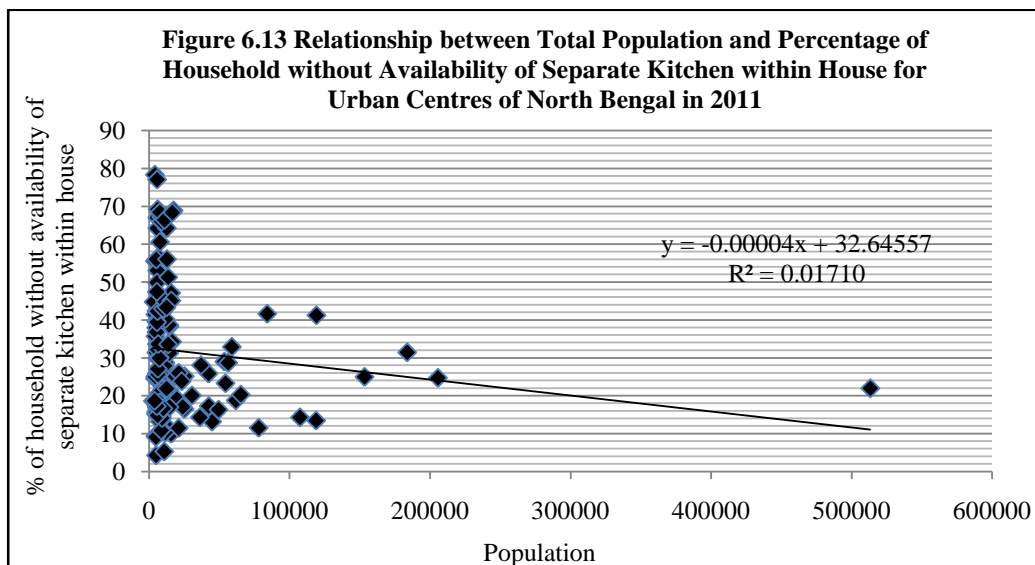


Figure 6.12 and 6.13 shows the relationship between total population and percentage of household without availability of separate kitchen within house for urban centres of North Bengal in 2001 and 2011 respectively. As seen in the figures there is a very weak positive relationship between population size and percentage of households without availability of separate kitchen within house across the urban centres of North Bengal in 2001 but in 2011 there is very weak negative relationship between population size and percentage of households without availability of separate kitchen within house across the urban centres of North Bengal. The insignificant regression coefficient both for 2001 and 2011 validates the inference. The coefficient of determination calculated shows in 2001 only about 4% of variation in the percentage of household without availability of separate kitchen within house can be explained by variation in population size of urban centres while in 2011 only about 1% of variation in the percentage of household without availability of separate kitchen within house can be explained by variation in population size of urban centres which signifies population size of an urban centre was insignificant in determining the percentage of household having separate kitchen within house across urban centres of North Bengal.

6.9 Drinking Water Quality and Noise Level across Urban Centres of North Bengal

The drinking water quality was analyzed by measuring the pH and TDS (Total dissolved solids) in water. The pH level of drinking water reflects how acidic it is. pH stands for 'potential of hydrogen' referring to the amount of hydrogen found in water. pH is measured on a scale that

runs from 0 to 14. Where 7 is neutral, meaning there is a balance between acid and alkalinity. A measurement below 7 means acid is present and a measurement above 7 is alkaline. Water with a very low or high pH can be sign of chemical or heavy metal pollution. According to the Bureau of Indian Standards the desirable pH of drinking water should be in the range of 6.5 to 8.5. Water that does not fall in the safe pH range of 6.5 to 8.5, particularly if it is alkaline is not necessarily unsafe. However, highly alkaline water can have an unpleasant smell or taste and it can also damage pipes and water carrying appliances. Acidic water with pH less than 6.5 is more likely to be contaminated with pollutants making it unsafe to drink.

Table 6.11 shows the pH of drinking water across 67 urban centres of North Bengal. The pH of drinking water was highest in Uttar Madarihat, followed by Old Maldah, Kurseong, Jagijhora Barabak and Sukhiapokhri respectively. The lowest pH of drinking water was recorded at Nagar Changrabandha, followed by Chakiabhita, Kharia, Hanskunda and Dakshin Odlabari respectively. Out of the 67 urban centres taken into consideration for analyzing the pH of drinking water, 9 urban centres i.e. 13.43% of total urban centres recorded a pH level beyond the desirable limit set by the Bureau of Indian Standards. These 9 urban centres were Uttar Madarihat, Nagar Changrabandha, Chakiabhita, Kharia, Hanskunda, Dakshin Odlabari, Gairkata, Chopra and Chak Bhrigu respectively spread across the districts of Jalpaiguri, Koch Bihar, Uttar Dinajpur and Dakshin Dinajpur. Therefore, the pH of drinking water in all the urban centres surveyed in the districts of Darjeeling and Maldah was within the desirable limit set down by the Bureau of Indian Standards.

TDS is measured in ppm. It is the total concentration of dissolved substances in water. TDS is made up of inorganic salts, as well as small amount of organic matter. Common inorganic salts that can be found in water include calcium, magnesium, potassium, sodium, carbonates, nitrates, bicarbonates, chlorides and sulphates. According to the Bureau of Indian Standards TDS level less than 50 ppm is unacceptable, in between 50 to 350 ppm is good and acceptable for drinking, in between 350 to 500 ppm is fair and beyond 500 ppm is not acceptable for drinking.

Table 6.11 also shows the TDS level in drinking water across 67 urban centres of North Bengal. The highest TDS level in drinking water was recorded at Par Patiram, followed by English Bazar, Balurghat, Kharimala Khagrabari and Islampur respectively. The lowest TDS level in drinking water was recorded at Sukhiapokhri, followed by Darjeeling, Sonada

Khasmahal, Mirik and Jagijhora Barabak respectively. Out of the 67 urban centres surveyed for measuring the TDS level in drinking water, 54 urban centres i.e. 80.60% of total urban centres recorded a TDS level in drinking water in between 50 to 350 ppm which is good and acceptable for drinking according to the Bureau of Indian Standards. 4 urban centres i.e. 5.97% of total urban centres recorded a TDS level in drinking water in between 350 to 500 ppm which is fair according to the Bureau of Indian Standards. However 9 urban centres i.e. 13.43% of total urban centres recorded a TDS level in drinking water below 50 ppm which is unacceptable according to the Bureau of Indian Standards. Out of these 9 urban centres, 5 belong to Darjeeling district and 4 belong to Jalpaiguri district. Infact most of the urban centres located in the hills recorded a TDS level in drinking water below 50 ppm making them unacceptable for drinking according to the Bureau of Indian Standards.

Table 6.11 Drinking Water Quality and Noise Level across Selected Urban Centres of North Bengal

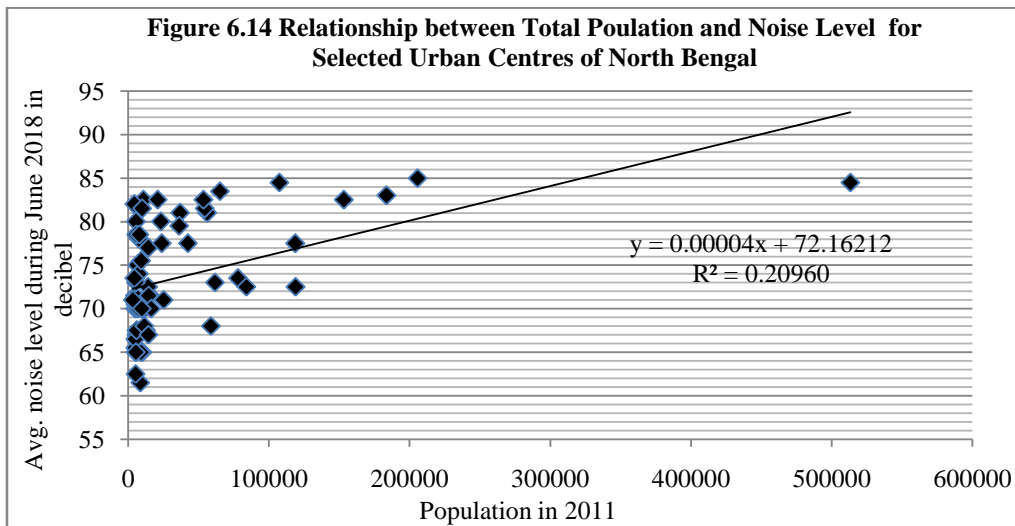
Sl. No	Urban Centre	Location	pH of Drinking Water	TDS of Drinking Water in ppm	Average Noise Level in Decibel
1	Aiho	24° 57.553' N, 88° 14.423' E	7.5	315	70.0
2	Alipurduar	26° 28.860' N, 89° 31.615' E	7.5	230	83.5
3	Bairatisal	26° 42.770' N, 88° 21.688' E	6.9	87	71.5
4	Baisguri	26° 20.611' N, 89° 28.410' E	7.2	319	70.5
5	Balurghat	25° 13.594' N, 88° 46.978' E	6.8	441	82.5
6	Bandhail	25° 12.876' N, 88° 11.695' E	7.2	335	78.5
7	Baneswar	26° 24.060' N, 89° 29.875' E	7.3	100	70.0
8	Bara Mohansingh	26° 42.334' N, 88° 21.880' E	7.1	86	71.5
9	Bholar Dabri	26° 30.710' N, 89° 31.918' E	7.5	154	67.5
10	Binnaguri	26° 38.914' N, 88° 30.121' E	7.5	104	68.0
11	Birpara	26° 28.976' N, 89° 30.531' E	6.9	115	82.5
12	Chak Bhriгу	25° 13.692' N, 88° 46.106' E	6.4	266	75.0
13	Chakchaka	26° 19.710' N, 89° 28.766' E	7.2	187	61.5
14	Chakiabhita	26° 39.093' N, 88° 30.781' E	6.0	70	65.0
15	Chalsa Mahabari	26° 52.884' N, 88° 48.171' E	7.6	66	73.5
16	Checha Khata	26° 31.245' N, 89° 32.074' E	7.4	128	78.0
17	Chhatianmor	25° 00.241' N, 88° 09.574' E	7.2	335	80.0
18	Chopra	26° 22.160' N, 88° 18.602' E	6.4	203	78.5
19	Cooch Behar	26° 19.350' N, 89° 26.463' E	6.8	343	73.5
20	Dabgram	26° 41.642' N, 88° 26.805' E	7.0	197	72.5
21	Dakra	25° 14.192' N, 88° 46.241' E	6.6	125	62.5
22	Dakshin Odlabari	26° 50.523' N, 88° 37.209' E	6.3	87	65.5
23	Dalkhola	25° 52.510' N, 87° 50.796' E	6.9	64	81.0
24	Darjeeling	27° 02.948' N, 88° 15.784' E	7.7	9	77.5
25	Dinhata	26° 07.675' N, 89° 27.795' E	6.6	332	79.5
26	English Bazar	25° 00.192' N, 88° 08.164' E	7.0	444	85.0
27	Gairkata	26° 42.041' N, 89° 01.602' E	6.4	122	74.0
28	Gangarampur	25° 24.324' N, 88° 31.337' E	6.8	206	81.0
29	Haldibari	26° 20.345' N, 88° 46.800' E	7.0	78	77.0
30	Hanskunda	26° 08.890' N, 88° 02.101' E	6.3	132	67.0
31	Islampur	26° 15.400' N, 88° 10.960' E	6.5	344	81.5
32	Itahar	25° 27.237' N, 88° 10.437' E	7.3	132	70.0

33	Jadupur	25° 04.220' N, 88° 08.779' E	7.0	86	70.0
34	Jagijhora Barabak	26° 42.385' N, 89° 05.363' E	7.8	24	67.5
35	Jalpaiguri	26° 31.448' N, 88° 43.188' E	7.4	75	84.5
36	Jitu	26° 42.984' N, 88° 22.036' E	7.1	60	67.0
37	Kachu Pukur	24° 59.106' N, 88° 15.058' E	7.2	316	65.0
38	Kaliaganj	25° 38.393' N, 88° 19.376' E	6.9	156	82.5
39	Kalkut	26° 45.884' N, 88° 25.128' E	7.5	61	75.5
40	Kasba	25° 35.331' N, 88° 7.776' E	7.0	68	65.0
41	Kendua	24° 58.107' N, 88° 14.673' E	7.0	257	67.5
42	Khagrabari	26° 20.742' N, 89° 26.910' E	6.6	330	80.0
43	Kharia	26° 30.835' N, 88° 41.001' E	6.1	140	73.0
44	Kharimala Khagrabari	26° 19.508' N, 89° 28.340' E	7.1	397	78.5
45	Kurseong	26° 52.743' N, 88° 16.637' E	7.9	39	77.5
46	Lataguri	26° 42.611' N, 88° 46.086' E	6.8	40	66.5
47	Mal	26° 52.227' N, 88° 44.864' E	6.6	29	71.0
48	Mangalbari	26° 52.287' N, 88° 48.183' E	7.3	68	67.5
49	Mathabhanga	26° 20.445' N, 89° 12.390' E	6.6	174	77.5
50	Mekliganj	26° 21.364' N, 88° 54.433' E	7.3	57	65.0
51	Mirik	26° 53.244' N, 88° 11.190' E	6.9	24	68.0
52	Nagar Changrabandha	26° 24.962' N, 88° 55.115' E	6	101	82.0
53	Odlabari	26° 51.935' N, 88° 37.481' E	7.4	53	72.5
54	Old Maldah	25° 02.608' N, 88° 08.099' E	8.3	72	72.5
55	Par Patiram	25° 19.776' N, 88° 45.565' E	6.6	466	71.0
56	Paschim Jitpur	26° 32.125' N, 89° 32.185' E	6.5	92	67.0
57	Raiganj	25° 37.953' N, 88° 07.929' E	6.6	90	83.0
58	Rangabhita	25° 12.356' N, 88° 11.329' E	7.5	272	65.0
59	Sahapur	24° 59.291' N, 88° 09.493' E	7.1	337	81.5
60	Siliguri	26° 42.667' N, 88° 25.572' E	6.9	165	84.5
61	Sobhaganj	26° 28.800' N, 89° 32.292' E	7.5	129	73.0
62	Sonada Khasmahal	26° 58.066' N, 88° 16.415' E	6.8	17	70.0
63	Sukhiapokhri	26° 59.865' N, 88° 10.006' E	7.8	4	73.5
64	Tari	26° 43.077' N, 88° 21.449' E	6.8	65	71.5
65	Tufanganj	26° 19.077' N, 89° 39.992' E	7	84	82.5
66	Uttar Latabari	26° 41.444' N, 89° 26.299' E	6.9	44	70.0
67	Uttar Madarihat	26° 41.397' N, 89° 16.735' E	9.3	111	70.0

Source: Primary Survey done during the month of June 2018

Noise pollution is generally defined as regular exposure to elevated sound levels that may lead to adverse effects in humans or other living organisms. According to the World Health Organization (WHO), sound levels less than 70 dB are not damaging to living organisms regardless of how long or consistent the exposure is. Exposure to more than 8 hours to constant noise beyond 85 dB may be hazardous. According to the Central Pollution Control Board, the ambient noise level during day time in industrial area is 75 dB, in commercial area is 65 dB, in residential area is 55 dB and in silerence zone is 50 dB. Continuous exposure to noise pollution can lead to disease like hypertension, hearing loss, sleep disturbances, impaired child development, psychological dysfunctions, etc.

Table 6.11 also shows the noise level across 67 urban centres of North Bengal during day time. As seen from the table the average noise level was highest in English Bazar, followed by Jalpaiguri, Siliguri, Alipurduar and Raiganj respectively. The average noise level was lowest in Chakchaka, followed by Dakra, Rangabhita, Mekliganj and Kasba respectively. Since the noise level was recorded preferably at the CBD of each urban centre so the ambient noise level of commercial area i.e. 65 dB set down by the Central Pollution Control Board can be taken as the benchmark. Accordingly, out of 67 urban centres considered for measuring the average noise level, 60 urban centres i.e. 89.55% of total urban centres reported an average noise level higher than the ambient level of 65dB for commercial areas set down by the Central Pollution Control Board. Therefore noise pollution was very much rampant across urban centres of North Bengal during the day time. Figure 6.14 shows the relationship between total population and average noise level for 67 selected urban centres of North Bengal. As seen from the figure there is a positive relationship between population size of any urban centre and their average noise level. Although the regression coefficient between the two variables is not that significant but the coefficient of determination shows that around 21% of variation in average noise level for any urban centre can be explained by variation in their population size.



6.10 Air Quality across Urban Centres of North Bengal

PM stands for Particulate Matter which is a mixture of solid particles and liquid droplets present in the atmosphere. The size of particles is directly linked to their potential for causing health hazard. Small particles less than 10 micrometers in diameter pose the greatest problems

because they can get deep into lungs and some may even get into blood streams. The primary sources of particulate matter include automobile emissions, dust and cooking smoke. The secondary sources of pollution can be complex reactions of chemicals like sulphur dioxide and nitrogen oxides. In addition to these, forest fire, wood burning, industry smoke and dust originated from construction works are other sources of air pollution. Both PM_{2.5} and PM₁₀ are so small that they cannot be viewed through naked eyes and while breathing when the particulate matter penetrate the lungs, a number of health impacts like coughing, wheezing, irritation in eyes, asthma attack, high blood pressure, heart attack and strokes may result in. According to the Central Pollution Control Board the concentration of PM_{2.5} and PM₁₀ in ambient air should be less than 60 µg / m³ and 100 µg / m³ respectively.

Table 6.12 Air Quality across Selected Urban Centres of North Bengal

Sl. No	Urban Centre	Location	PM _{2.5} (µg / m ³)	PM ₁₀ (µg / m ³)	TVOC (mg / m ³)	HCHO (mg / m ³)
1	Aiho	24° 57.553' N, 88° 14.423' E	25	29	0.034	0.000
2	Alipurduar	26° 28.860' N, 89° 31.615' E	33	36	0.207	0.012
3	Bairatisal	26° 42.770' N, 88° 21.688' E	68	75	0.095	0.000
4	Baisguri	26° 20.611' N, 89° 28.410' E	27	30	0.103	0.000
5	Balurghat	25° 13.594' N, 88° 46.978' E	36	40	0.121	0.006
6	Bandhail	25° 12.876' N, 88° 11.695' E	30	35	0.058	0.000
7	Baneswar	26° 24.060' N, 89° 29.875' E	13	14	0.177	0.040
8	Bara Mohansingh	26° 42.334' N, 88° 21.880' E	82	91	0.060	0.000
9	Bholar Dabri	26° 30.710' N, 89° 31.918' E	9	10	0.037	0.013
10	Binnaguri	26° 38.914' N, 88° 30.121' E	11	12	0.080	0.005
11	Birpara	26° 28.976' N, 89° 30.531' E	28	31	0.404	0.012
12	Chak Bhrigu	25° 13.692' N, 88° 46.106' E	50	56	0.041	0.007
13	Chakchaka	26° 19.710' N, 89° 28.766' E	6	6	0.005	0.000
14	Chakiabhita	26° 39.093' N, 88° 30.781' E	8	8	0.052	0.000
15	Chalsa Mahabari	26° 52.884' N, 88° 48.171' E	30	33	0.094	0.000
16	Checha Khata	26° 31.245' N, 89° 32.074' E	24	26	0.097	0.000
17	Chhatianmor	25° 00.241' N, 88° 09.574' E	35	40	0.030	0.004
18	Chopra	26° 22.160' N, 88° 18.602' E	54	60	0.626	0.019
19	Cooch Behar	26° 19.350' N, 89° 26.463' E	33	36	0.162	0.000
20	Dabgram	26° 41.642' N, 88° 26.805' E	58	64	0.170	0.000
21	Dakra	25° 14.192' N, 88° 46.241' E	26	29	0.062	0.000
22	Dakshin Odlabari	26° 50.523' N, 88° 37.209' E	24	26	0.104	0.018
23	Dalkhola	25° 52.510' N, 87° 50.796' E	70	78	0.314	0.000
24	Darjeeling	27° 02.948' N, 88° 15.784' E	35	40	0.108	0.006
25	Dinhata	26° 07.675' N, 89° 27.795' E	19	21	0.132	0.000
26	English Bazar	25° 00.192' N, 88° 08.164' E	94	105	0.150	0.020
27	Gairkata	26° 42.041' N, 89° 01.602' E	22	24	0.130	0.018
28	Gangarampur	25° 24.324' N, 88° 31.337' E	39	43	0.720	0.086
29	Haldibari	26° 20.345' N, 88° 46.800' E	27	30	0.040	0.000
30	Hanskunda	26° 08.890' N, 88° 02.101' E	45	50	0.090	0.004
31	Islampur	26° 15.400' N, 88° 10.960' E	58	64	0.104	0.000
32	Itahar	25° 27.237' N, 88° 10.437' E	30	34	0.101	0.000
33	Jadupur	25° 04.220' N, 88° 08.779' E	45	50	0.050	0.015
34	Jagijhora Barabak	26° 42.385' N, 89° 05.363' E	25	28	0.165	0.013
35	Jalpaiguri	26° 31.448' N, 88° 43.188' E	58	64	0.218	0.010

36	Jitu	26° 42.984' N, 88° 22.036' E	95	105	0.035	0.000
37	Kachu Pukur	24° 59.106' N, 88° 15.058' E	23	25	0.003	0.000
38	Kaliaganj	25° 38.393' N, 88° 19.376' E	63	70	0.236	0.018
39	Kalkut	26° 45.884' N, 88° 25.128' E	75	84	0.201	0.006
40	Kasba	25° 35.331' N, 88° 7.776' E	48	53	0.023	0.000
41	Kendua	24° 58.107' N, 88° 14.673' E	50	55	0.120	0.010
42	Khagrabari	26° 20.742' N, 89° 26.910' E	32	35	0.109	0.000
43	Kharia	26° 30.835' N, 88° 41.001' E	14	15	0.131	0.006
44	Khmarimala Khagrabari	26° 19.508' N, 89° 28.340' E	53	59	0.175	0.008
45	Kurseong	26° 52.743' N, 88° 16.637' E	56	62	0.735	0.003
46	Lataguri	26° 42.611' N, 88° 46.086' E	14	15	0.024	0.000
47	Mal	26° 52.227' N, 88° 44.864' E	20	22	0.089	0.017
48	Mangalbari	26° 52.287' N, 88° 48.183' E	10	11	0.032	0.000
49	Mathabhanga	26° 20.445' N, 89° 12.390' E	11	12	0.092	0.000
50	Mekliganj	26° 21.364' N, 88° 54.433' E	10	11	0.020	0.000
51	Mirik	26° 53.244' N, 88° 11.190' E	40	44	0.012	0.002
52	Nagar Changrabandha	26° 24.962' N, 88° 55.115' E	13	14	0.335	0.011
53	Odlabari	26° 51.935' N, 88° 37.481' E	20	22	0.117	0.000
54	Old Maldah	25° 02.608' N, 88° 08.099' E	34	38	0.070	0.003
55	Par Patiram	25° 19.776' N, 88° 45.565' E	30	33	0.019	0.000
56	Paschim Jitpur	26° 32.125' N, 89° 32.185' E	8	8	0.036	0.000
57	Raiganj	25° 37.953' N, 88° 07.929' E	63	70	0.107	0.014
58	Rangabhita	25° 12.356' N, 88° 11.329' E	40	45	0.049	0.014
59	Sahapur	24° 59.291' N, 88° 09.493' E	35	40	0.040	0.015
60	Siliguri	26° 42.667' N, 88° 25.572' E	62	69	0.105	0.003
61	Sobhaganj	26° 28.800' N, 89° 32.292' E	23	25	0.147	0.000
62	Sonada Khasmahal	26° 58.066' N, 88° 16.415' E	36	40	0.003	0.023
63	Sukhiapokhri	26° 59.865' N, 88° 10.006' E	40	44	0.188	0.003
64	Tari	26° 43.077' N, 88° 21.449' E	85	95	0.280	0.000
65	Tufanganj	26° 19.077' N, 89° 39.992' E	35	39	0.134	0.000
66	Uttar Latabari	26° 41.444' N, 89° 26.299' E	10	11	0.064	0.000
67	Uttar Madarihat	26° 41.397' N, 89° 16.735' E	56	62	0.062	0.013

Source: Primary Survey done during the month of June 2018

Table 6.12 shows the concentration of PM_{2.5} and PM₁₀ in air across 67 urban centres of North Bengal. The concentration of PM_{2.5} was highest in Jitu, followed by English Bazar, Tari, Bara Mohansingh and Kalkut respectively while it was lowest in Chakchaka, followed by Paschim Jitpur, Chakiabhita, Bholar Dabri and Uttar Latabari respectively. As seen from the table, 10 urban centres i.e. 14.92% of total urban centres recorded a concentration of PM_{2.5} above 60 µg / m³ in ambient air. Majority of these urban centres are from the plains of Darjeeling district. The concentration of PM₁₀ was highest in English Bazar, followed by Jitu, Tari, Bara Mohansingh and Kalkut respectively while it was lowest in Chakchaka, followed by Paschim Jitpur, Chakiabhita, Bholar Dabri and Uttar Latabari respectively. As seen from the table, only 2 urban centres i.e. 2.99% of total urban centres recorded a concentration of PM₁₀ above 100 µg / m³. Thus more number of urban centres are within the safe limit of PM₁₀ concentration compared to PM_{2.5} concentration in ambient air across North Bengal.

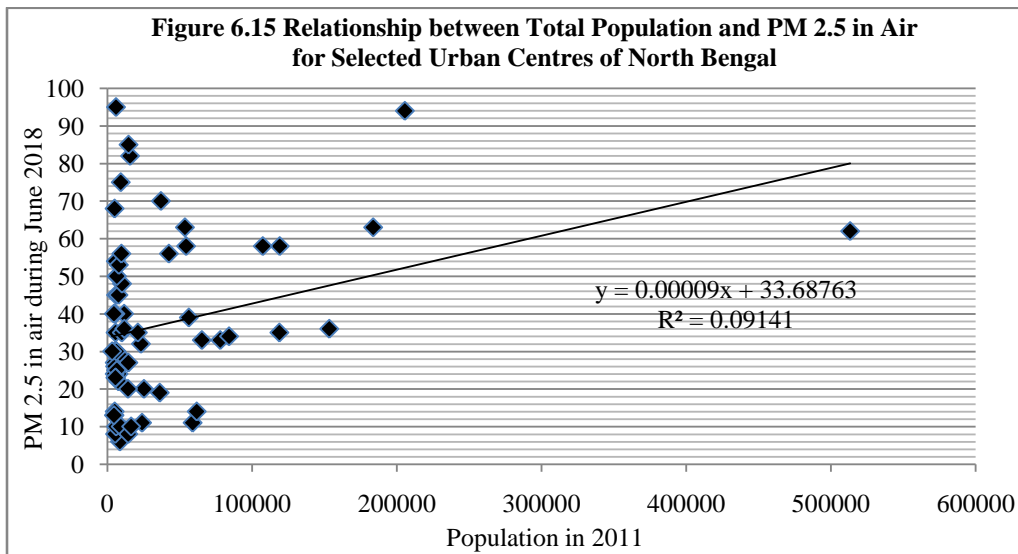
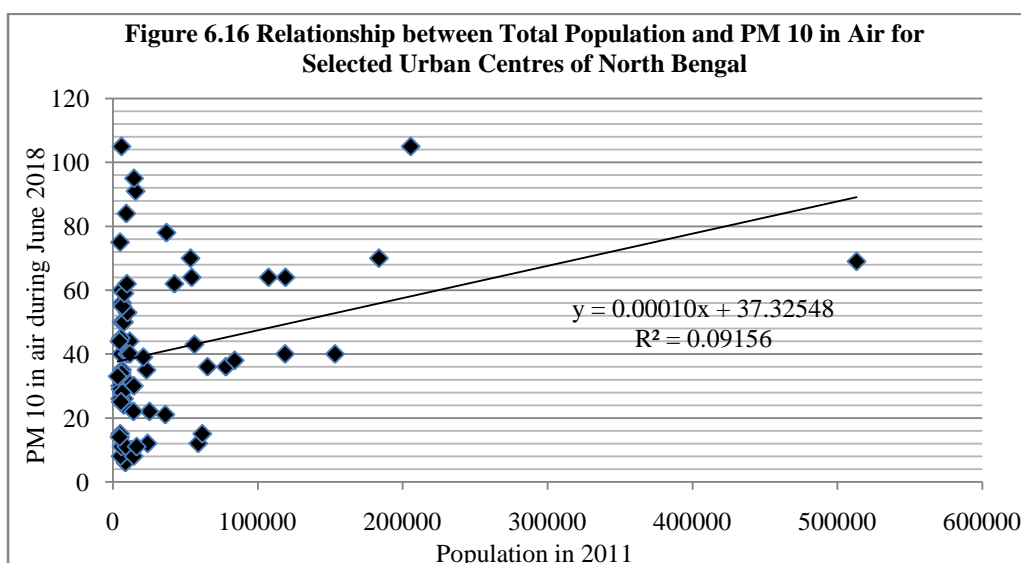


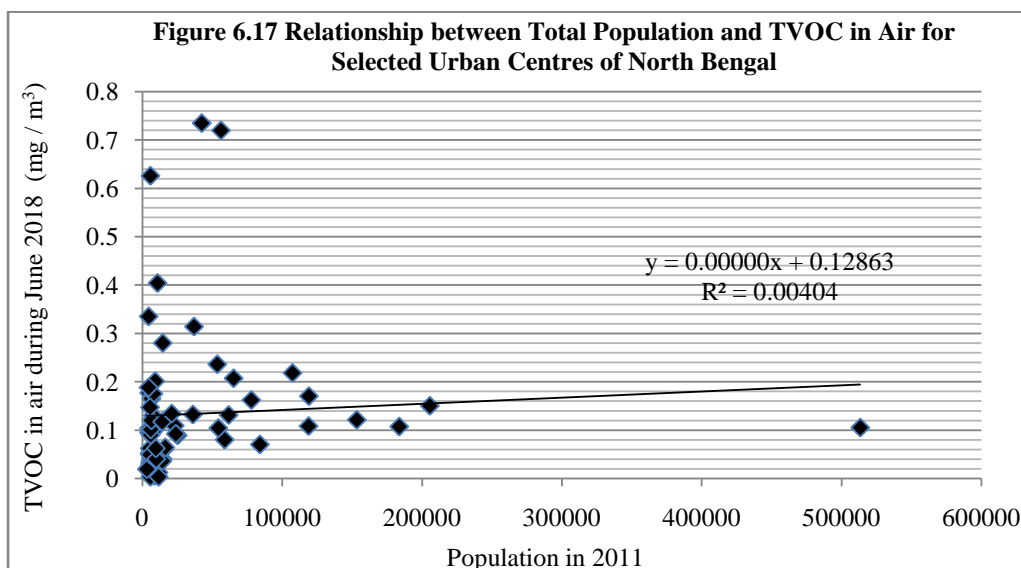
Figure 6.15 and 6.16 shows the relationship between total population and concentration of PM_{2.5} and PM₁₀ in ambient air across 67 urban centres of North Bengal. As seen from the figures there is a positive relationship between the population size of any urban centre and the concentration of PM_{2.5} and PM₁₀ respectively. However the regression coefficient for both the relationships is very less. Moreover, the coefficient of determination calculated for both the relationships was about 9% which signifies only 9% of variation in concentration of PM_{2.5} and PM₁₀ in ambient air across the urban centres of North Bengal can be explained by variation in their population size.



Volatile Organic Compounds (VOCs) are emitted as gases from certain solids or liquids. VOCs include a variety of chemicals, some of which may have short term and long term adverse

health effects. The sources of VOCs are paints, wood preservatives, aerosol sprays, cleansers and disinfectants, air freshners, fossil fuel, automobile exhaust, pesticides etc. The health effect of VOCs are eye, nose and throat irritation, headaches, nausea, damage to liver, kidney and central nervous system, skin allergy, fatigue and drizziness. The concentration of Total Volatile Organic Compound (TVOC) less than 0.2 mg / m^3 have no irritation or discomfort for human beings but when the concentration level rises above 0.2 mg / m^3 it becomes a concern for human beings.

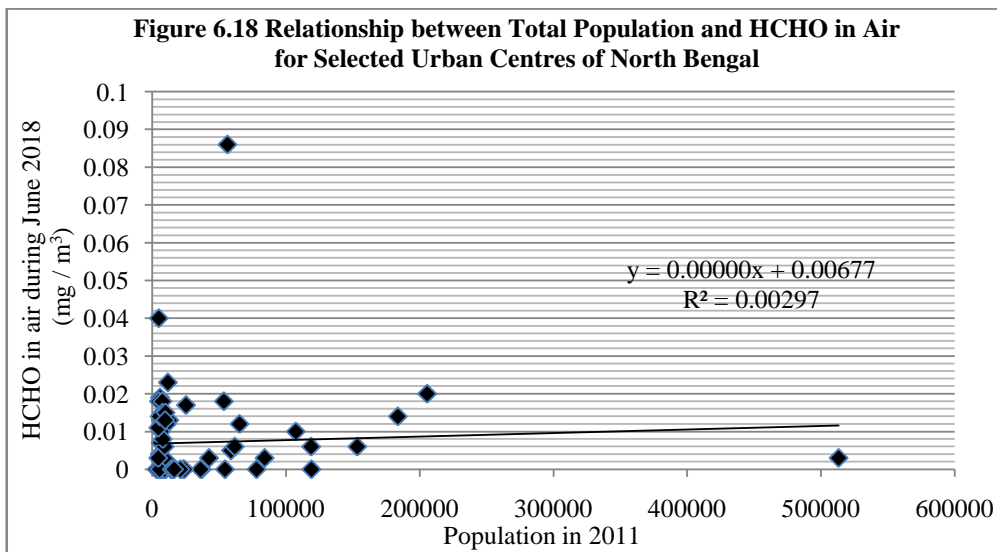
Table 6.12 also shows the concentration of TVOC in air across 67 urban centres of North Bengal. The highest concentration of TVOC was recorded at Kurseong, followed by Gangarampur, Chopra, Birpara and Nagar Changrabandha respectively while the lowest concentration was recorded at Sonada Khasmahal, followed by Kachu Pukur, Chakchaka, Mirik and Par Patiram respectively. 11 urban centres i.e. 16.42% of total urban centres recorded a TVOC level above 0.2 mg / m^3 . Figure 6.17 shows the relationship between total population and TVOC in air for 67 urban centres of North Bengal. As seen from the figure there is no relationship between population size of any urban centre and the concentration of TVOC across urban centres of North Bengal. The regression coefficient and the coefficient of determination validate the inference.



HCHO or Formaldehyde is a colourless gas, which has a strong choking smell. Formaldehyde is a gaseous pollutant produced by both human activity and natural sources like combustion of fossil fuel and automotive exhaust, power plants, building material and paints, tobacco smoke, cosmetics, fertilizer etc. A high concentration of formaldehyde may cause a

burning sensation to the eyes, nose, throat and lungs. A concentration of HOHO below $0.0123 \text{ mg} / \text{m}^3$ has very little health impact but when it exceeds this level it tends to affect human beings.

Table 6.12 also shows the concentration of HCHO in air across 67 urban centres of North Bengal. The highest concentration of HCHO was recorded at Gangarampur, followed by Banerwar, Sonada Khasmahal, English Bazar and Chopra respectively while the lowest concentration was recorded at Uttar Latabari, followed by Tufanganj, Tari, Sobhaganj and Paschim Jitpur respectively. 16 urban centres i.e. 23.88% of total urban centres recorded a concentration of HCHO above $0.0123 \text{ mg} / \text{m}^3$. Figure 6.18 shows the relationship between total population and concentration of HCHO in air across 67 urban centres of North Bengal. As seen from the figure there is no relationship between population size of any urban centre and their concentration of HCHO in air. The regression coefficient and the coefficient of determination calculated validate this inference.



6.11 Traffic Volume and Average Waiting Time across Urban Centres of North Bengal

The traffic volume in the busiest intersection of any urban centre was compared by calculating the PCU / Hr. The PCU (Passenger Car Unit) is a metric used in transport engineering to assess traffic volume on a highway or intersection point. The value of PCU for different types of vehicles has been assigned as follows:

Vehicle Type	PCU
Car, Taxi, Jeep	1.00
Two Wheeler	0.50
Light Commercial Vehicle	2.20
Bus, Truck	3.50
Three Wheeler	0.80
Bicycle	0.20

Table 6.13 Traffic Volume and Average Waiting Time in Traffic Junction across Selected Urban Centres of North Bengal

Sl. No	Urban Centre	Location	Traffic Volume (PCU / Hr)	Average Waiting Time in Traffic Junction (in mim)
1	Aiho	24° 57.553' N, 88° 14.423' E	495	0
2	Alipurduar	26° 28.860' N, 89° 31.615' E	2943	10
3	Bairaisal	26° 42.770' N, 88° 21.688' E	529	0
4	Baisguri	26° 20.611' N, 89° 28.410' E	748	0
5	Balurghat	25° 13.594' N, 88° 46.978' E	2591	10
6	Bandhail	25° 12.876' N, 88° 11.695' E	2241	10
7	Baneswar	26° 24.060' N, 89° 29.875' E	475	0
8	Bara Mohansingh	26° 42.334' N, 88° 21.880' E	392	0
9	Bholar Dabri	26° 30.710' N, 89° 31.918' E	1042	0
10	Binnaguri	26° 38.914' N, 88° 30.121' E	549	0
11	Birpara	26° 28.976' N, 89° 30.531' E	1685	0
12	Chak Bhrigu	25° 13.692' N, 88° 46.106' E	992	0
13	Chakchaka	26° 19.710' N, 89° 28.766' E	338	0
14	Chakiabhita	26° 39.093' N, 88° 30.781' E	390	0
15	Chalsa Mahabari	26° 52.884' N, 88° 48.171' E	1109	0
16	Checha Khata	26° 31.245' N, 89° 32.074' E	1190	0
17	Chhatianmor	25° 00.241' N, 88° 09.574' E	870	0
18	Chopra	26° 22.160' N, 88° 18.602' E	2133	0
19	Cooch Behar	26° 19.350' N, 89° 26.463' E	1768	10
20	Dabgram	26° 41.642' N, 88° 26.805' E	720	0
21	Dakra	25° 14.192' N, 88° 46.241' E	70	0
22	Dakshin Odlabari	26° 50.523' N, 88° 37.209' E	476	0
23	Dalkhola	25° 52.510' N, 87° 50.796' E	1219	120
24	Darjeeling	27° 02.948' N, 88° 15.784' E	1040	0
25	Dinhata	26° 07.675' N, 89° 27.795' E	1812	5
26	English Bazar	25° 00.192' N, 88° 08.164' E	4352	60
27	Gairkata	26° 42.041' N, 89° 01.602' E	967	0
28	Gangarampur	25° 24.324' N, 88° 31.337' E	2404	5
29	Haldibari	26° 20.345' N, 88° 46.800' E	674	0
30	Hanskunda	26° 08.890' N, 88° 02.101' E	1120	0
31	Islampur	26° 15.400' N, 88° 10.960' E	2705	30
32	Itahar	25° 27.237' N, 88° 10.437' E	1415	2
33	Jadupur	25° 04.220' N, 88° 08.779' E	1415	0
34	Jagijhora Barabak	26° 42.385' N, 89° 05.363' E	1829	0
35	Jalpaiguri	26° 31.448' N, 88° 43.188' E	3402	15
36	Jitu	26° 42.984' N, 88° 22.036' E	231	0
37	Kachu Pukur	24° 59.106' N, 88° 15.058' E	293	0
38	Kaliaganj	25° 38.393' N, 88° 19.376' E	647	5
39	Kalkut	26° 45.884' N, 88° 25.128' E	689	0
40	Kasba	25° 35.331' N, 88° 7.776' E	449	0
41	Kendua	24° 58.107' N, 88° 14.673' E	344	0
42	Khagrabari	26° 20.742' N, 89° 26.910' E	1063	0

43	Kharia	26° 30.835' N, 88° 41.001' E	690.6	0
44	Kharimala Khagrabari	26° 19.508' N, 89° 28.340' E	1207	0
45	Kurseong	26° 52.743' N, 88° 16.637' E	503	0
46	Lataguri	26° 42.611' N, 88° 46.086' E	709	0
47	Mal	26° 52.227' N, 88° 44.864' E	1012	0
48	Mangalbari	26° 52.287' N, 88° 48.183' E	594	0
49	Mathabhanga	26° 20.445' N, 89° 12.390' E	2175	0
50	Mekliganj	26° 21.364' N, 88° 54.433' E	302	0
51	Mirik	26° 53.244' N, 88° 11.190' E	273	0
52	Nagar Changrabandha	26° 24.962' N, 88° 55.115' E	1112	0
53	Odlabari	26° 51.935' N, 88° 37.481' E	843	0
54	Old Maldah	25° 02.608' N, 88° 08.099' E	651	0
55	Par Patiram	25° 19.776' N, 88° 45.565' E	1147	0
56	Paschim Jitpur	26° 32.125' N, 89° 32.185' E	466	0
57	Raiganj	25° 37.953' N, 88° 07.929' E	3993	25
58	Rangabhita	25° 12.356' N, 88° 11.329' E	1311	0
59	Sahapur	24° 59.291' N, 88° 09.493' E	632	0
60	Siliguri	26° 42.667' N, 88° 25.572' E	6654	20
61	Sobhaganj	26° 28.800' N, 89° 32.292' E	905	0
62	Sonada Khasmahal	26° 58.066' N, 88° 16.415' E	495	0
63	Sukhiapokhri	26° 59.865' N, 88° 10.006' E	198	0
64	Tari	26° 43.077' N, 88° 21.449' E	475	0
65	Tufanganj	26° 19.077' N, 89° 39.992' E	935	10
66	Uttar Latabari	26° 41.444' N, 89° 26.299' E	521	0
67	Uttar Madarihat	26° 41.397' N, 89° 16.735' E	1381	0
Source: Primary Survey done during the month of June 2018				

Table 6.13 shows the traffic volume in PCU at the busiest traffic junction across 67 urban centres of North Bengal. As seen from the table the highest traffic volume was recorded at Siliguri, followed by English Bazar, Raiganj, Jalpaiguri and Alipurduar respectively. The lowest traffic volume was recorded at Dakra, followed by Sukhiapokhri, Jitu, Mirik and Kachu Pukur respectively. As evident from the table there was a lot of variation across the urban centres with respect to their traffic volume. The traffic volume was high for the statutory towns and also for the district headquarters. Those smaller urban centres which were located along the highways also recorded very high traffic volume. Figure 6.19 shows the relationship between total population and traffic volume across 67 urban centres of North Bengal. As seen from the figure there is a highly positive relationship between the population size of any urban centre and their volume of traffic. The regression coefficient calculated is quite strong. The coefficient of determination calculated shows that about 64% of variation in traffic volume across urban centres of North Bengal can be explained by variation in their population size.

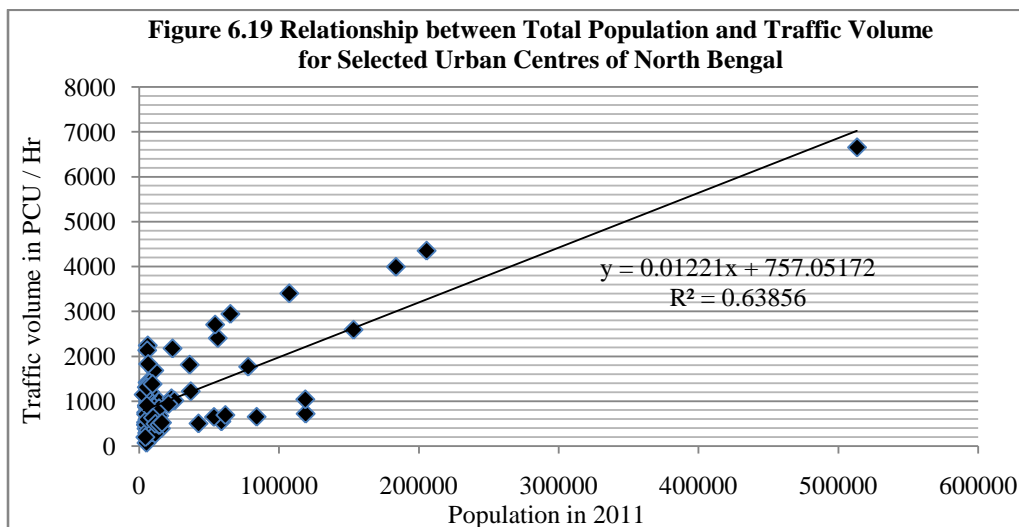
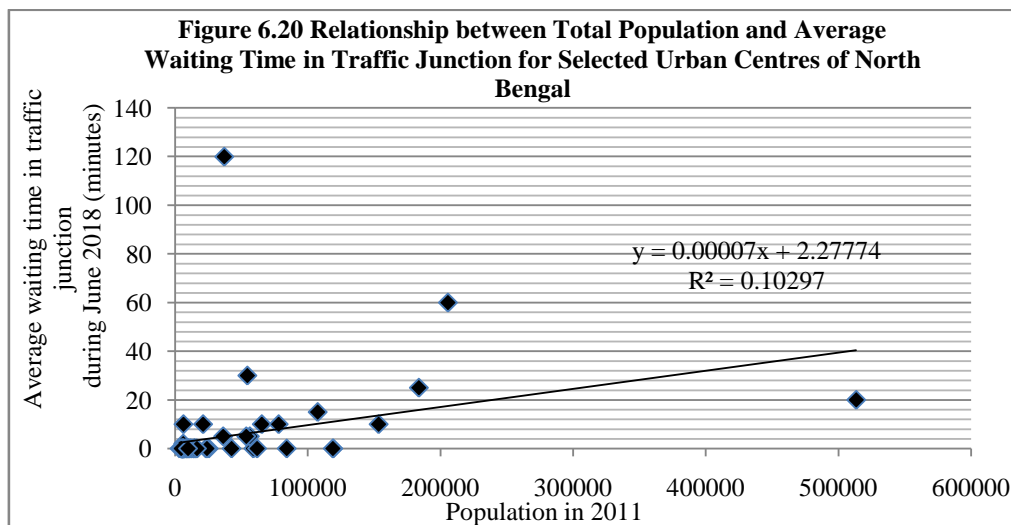


Table 6.13 also shows the average waiting time at the busiest traffic intersection for 67 urban centres of North Bengal. The average waiting time for traffic was highest in Dalkhola, followed by English Bazar, Islampur, Raiganj and Siliguri respectively. The interesting observation was, out of 67 urban centres surveyed 52 of them i.e. in 77.61% of urban centres there was no waiting time at traffic intersection. It was only the larger urban centres with high volume of traffic that reported substantial waiting period. Dalkhola reported an exceptionally very high waiting period because the national highway which passes through the heart of the city remains blocked during majority of time because of the railway crossing. The high waiting period for English Bazar was due to the fact that NH34 with its huge volume of traffic passes through the heart of the city creating a lot of bottlenecks at traffic intersections. Figure 6.20 shows the relationship between total population and average waiting time in traffic junction across 67 urban centres of North Bengal. As seen from the figure there is a positive relationship between the population size of any urban centre and the average waiting period at traffic intersection. The coefficient of determination calculated shows that about 10% of variation in average waiting period in traffic intersection for any urban centre can be explained by their variation in population size.



6.12 Summary

In this chapter the main objective was to analyze the problems associated with rapid urbanization in North Bengal. One of the major problems of urbanization in India has been the proliferation of slums. In North Bengal slums were reported in 7 urban centres in 2001 which increased to 22 urban centres in 2011. Therefore like other parts of the country the urban centres of North Bengal also witnessed proliferation of slums in recent years.

Another problem of rapid urbanization in North Bengal was the availability of safe drinking water. In 2001 25% of total urban centres of North Bengal reported more than 1/3rd of their total households without access to safe drinking water which in 2011 increased for 29% of total urban centres of North Bengal. These urban centres were mostly located in the districts of Darjeeling and Jalpaiguri respectively. However, the brighter side of the story was in 2011 compared to 2001, out of 47 urban centres which were common during 2001 and 2011, 76.60% of urban centres saw a decline in their percentage of household without access to safe drinking water facility. There was no relationship between the population size of any urban centre and their percentage of household without access to safe drinking water facility.

With respect to percentage of household without electricity facility, 52.08% of urban centres of North Bengal in 2001 reported more than 1/3rd of their total households without electricity facility which in 2011 declined for 38.93 % of urban centres of North Bengal. These urban centres were mostly located in the districts of Jalpaiguri, Koch Bihar and Maldah respectively. Households in statutory towns have better electricity facility compared to census

towns of North Bengal. However, the important point to note, out of 47 urban centres which were common in 2001 and 2011, 97.87% of urban centres saw a decline in their percentage of households without electricity facility in 2011 compared to 2001. There was a weak negative relationship between the population size of any urban centre and their percentage of households without electricity facility.

With respect to percentage of household without latrine facility, 35.42% of total urban centres of North Bengal in 2001 reported more than 1/4th of their total households without latrine facility which increased for 44.27% of total urban centres of North Bengal in 2011. These urban centres were mostly located in the districts of Jalpaiguri, Maldah and Darjeeling respectively. Households in statutory towns have better latrine facility compared to census towns of North Bengal. 87.23% of urban centres which were common both in 2001 and 2011 saw a decline in their percentage of households without latrine facility in 2011 compared to 2001. There was a weak negative relationship between the population size of any urban centre and their percentage of households without latrine facility.

With respect to percentage of household without bathroom facility, 89.58% of total urban centres of North Bengal in 2001 reported more than 1/3rd of their total households without bathroom facility which in 2011 decreased for 72.51% total urban centres of North Bengal. These urban centres were mostly located in the districts of Jalpaiguri, Koch Bihar, Darjeeling and Maldah respectively. Households in statutory towns have better bathroom facility compared to census towns of North Bengal. 97.87% of total urban centres which were common in 2001 and 2011 saw a decline in their percentage of households without bathroom facility in 2011 compared to 2001. There was a weak negative relationship between the population size of any urban centre and their percentage of households without bathroom facility.

With respect to percentage of household without drainage facility, 85.42% of total urban centres of North Bengal in 2001 reported more than 1/3rd of their total households without drainage facility which slightly declined for 84.73% of urban centres of North Bengal in 2011. These urban centres were mostly located in the districts of Jalpaiguri, Maldah, Darjeeling and Koch Bihar respectively. Households in statutory towns have better drainage facility compared to census towns of North Bengal. However, in 87.23% of total urban centres which were common in 2001 and 2011, recorded a decline in their percentage of households without

drainage facility in 2011 compared to 2001. There was a negative relationship between the population size of any urban centre and their percentage of households without drainage facility.

With respect to availability of separate kitchen, 39.58% of total urban centres of North Bengal in 2001 reported more than 1/4th of their total households without separate kitchen which increased for 57.25% of total urban centres of North Bengal in 2011. These urban centres were mostly located in the districts of Jalpaiguri, Maldah and Darjeeling respectively. However, 61.70% of total urban centres which were common in 2001 and 2011 recorded a decline in their percentage of households without separate kitchen in 2011 compared to 2001. There was a weak positive relationship between the population size of any urban centre and their percentage of households without separate kitchen in 2001; however this relationship turned negative in 2011.

The pH of drinking water in 13.43% of 67 urban centres surveyed across North Bengal exceeded the desirable limit set down by the Bureau of Indian Standards. Similarly the TDS of drinking water in 13.43% of 67 urban centres surveyed across North Bengal was unacceptable according to the limits set down by the Bureau of Indian Standards. With respect to noise pollution, 89.55% of 67 urban centres surveyed across North Bengal reported an average noise level higher than the limit set down by the Central Pollution Control Board. There was a positive relationship between population size of any urban centre and their average noise level in North Bengal.

With respect to air quality surveyed across 67 urban centres of North Bengal, 14.92% of urban centres exceeded the limit for PM_{2.5} concentration in air and 2.99% of urban centres exceeded the limit for PM₁₀ concentration in air laid down by the Central Pollution Control Board. There was a positive relationship in between the population size of any urban centre and their concentration of PM_{2.5} and PM₁₀ in ambient air across urban centres of North Bengal. The TVOC and HCHO concentration exceeded their acceptable level in 16.42% and 23.88% of 67 urban centres surveyed respectively. There was no relationship between the population size of any urban centre and their TVOC and HCHO concentration in air for urban centres of North Bengal.

Traffic volume and waiting period at traffic intersections varied across the 67 urban centres surveyed in North Bengal. There was a strong positive relationship between population size of any urban centre and their volume of traffic across urban centres of North Bengal;

however the relationship with population size of any urban centre and average waiting time at traffic intersection across 67 urban centres surveyed across North Bengal was mild positive.

Therefore, the last hypothesis considered that the problems associated with urban development are more for the larger urban centres is partially correct. With most of the indicators related to housing condition like electricity facility, latrine facility, bathroom facility and drainage facility the larger urban centres were in a better position compared to smaller urban centres. However, with respect to noise pollution, air quality and traffic problems the larger urban centres were more vulnerable compared to smaller urban centres of North Bengal.

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