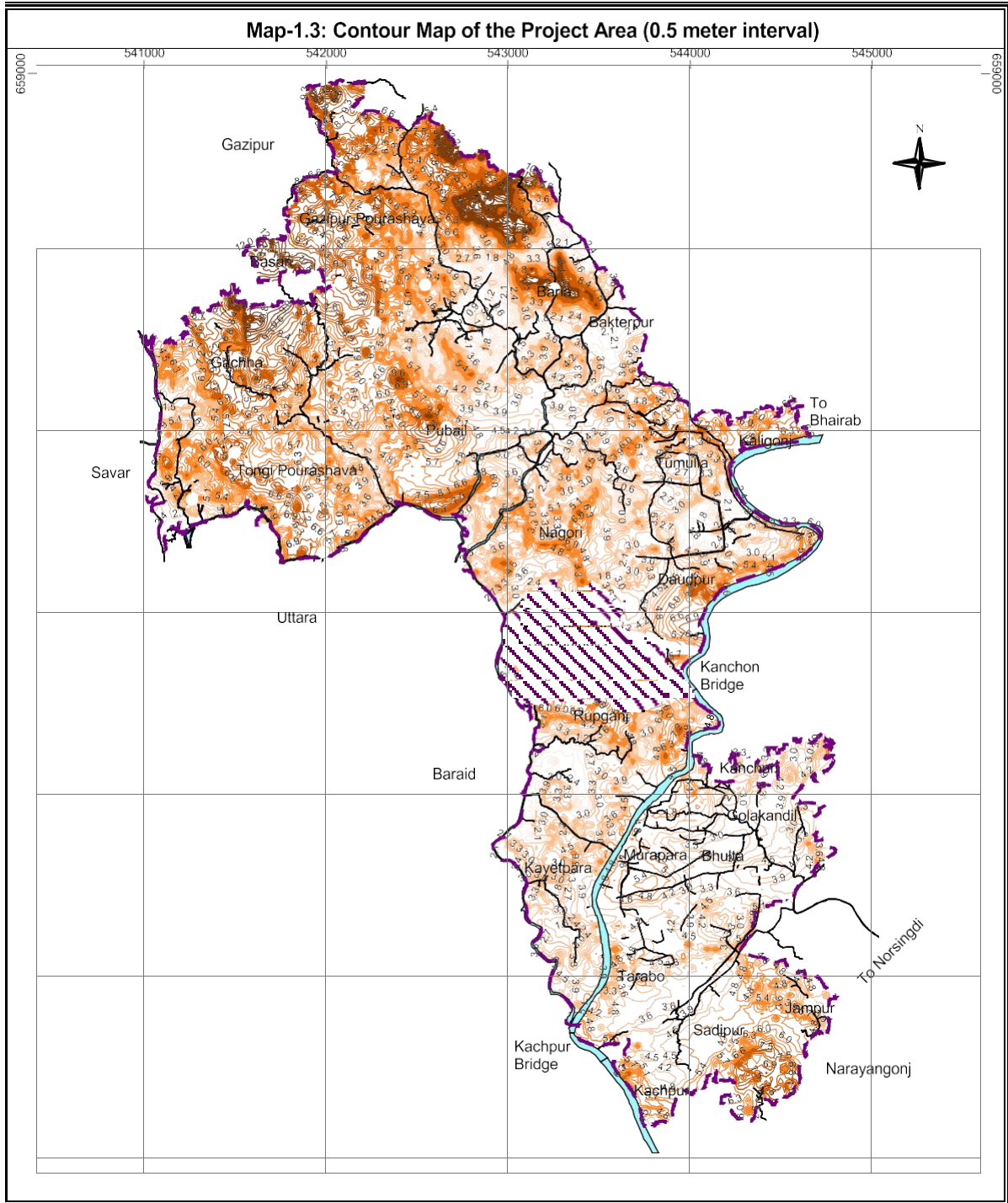


Map-1.3: Contour Map of the Project Area (0.5 meter interval)



<p>CONSULTANT Development Design Consultants Ltd. 47 Mohakhali C/A, Dhaka 1212, Bangladesh Divine Associates Limited</p>	<p>Detailed Area Plan for DMDP Area, Group-A</p>	<p>CLIENT Government of the People's Republic of Bangladesh Ministry of Housing and Public Works Rajdhani Unnayan Karttripakkha (RAJUK)</p>																
<p>INDEX MAP DMDP AREA</p>	<p>LEGEND</p> <ul style="list-style-type: none"> Project Boundary Purbachal Housing Contour Line (0.5 M interval) -5.7 - 2.4 2.4 - 4.5 4.5 - 6.6 6.6 - 9.6 9.6 - 16.8 Waterbody Khal River 	<p>NOTES</p> <p>Data Source GPS & Total Station based advanced topographic physical feature and land use survey conducted by Development Design Consultants Ltd</p> <p>Reference Bench Mark (BM) * SGB (ICA)-3407 and SGB (ICA)-3469 for Latitude Northing & Longitude Easting * SGB-542 west, SGB-6039 for Reduce Level (RL) adjustment</p> <p>Projection Parameters</p> <table border="0"> <tr> <td>Projection System</td> <td>: Bangladesh Transverse Mercator (BTM)</td> </tr> <tr> <td>Spheroid</td> <td>: Everest 1830</td> </tr> <tr> <td>Scale Factor</td> <td>: 0.9996</td> </tr> <tr> <td>Central Meridian</td> <td>: 90 degree East</td> </tr> <tr> <td>False Easting</td> <td>: 500,000 Meter</td> </tr> <tr> <td>False Northing</td> <td>: -2000,000 Meter</td> </tr> <tr> <td>Latitude of Origin</td> <td>: 0 degree (Equator)</td> </tr> <tr> <td>Seven-parameters for User Defined Datum</td> <td>: 283.725, 735.942, 261.143, 0.0, 0.0, 0.0, 1.0</td> </tr> </table>	Projection System	: Bangladesh Transverse Mercator (BTM)	Spheroid	: Everest 1830	Scale Factor	: 0.9996	Central Meridian	: 90 degree East	False Easting	: 500,000 Meter	False Northing	: -2000,000 Meter	Latitude of Origin	: 0 degree (Equator)	Seven-parameters for User Defined Datum	: 283.725, 735.942, 261.143, 0.0, 0.0, 0.0, 1.0
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Chapter-2

CRITICAL PLANNING ISSUES

Chapter - 2

CRITICAL PLANNING ISSUES

2.1 Existing Development Pattern

Existing urban centers of the study area are Tongi Pourashava, Gazipur Pourashava, Kaliganj Upazila, Rupganj Upazila and Bhulta Bazar area. According to the 1991 census, about 10% of the total area was urban and rest in flood plains and non-urban areas. Comprehensive planning approach was adopted for those urban areas where development has already taken place to a large extent. In comprehensive detailed area planning, as far as possible, the existing structures (where necessary) were retained. Emphasis was duly given mainly on development of new infrastructure.

2.1.1 General

Wide variation is found in the existing development pattern of the Group-A area. There is no planned residential area (except Purbachal). Most of the settlements are mixed use zones. However, dominant use in the mixed use zones is residential use except some areas of Pubali, Kaliganj and Rupganj where agricultural use dominates. It is mentioned that the industrial dominated areas of Tongi Pourashava and part of Baiddar Bazar and Bhulta areas were designated as industrial in the 1959 Master Plan. Except those industrial areas, another industrial area is found in Kaliganj Pourashava. A large section of the Group-A area is rural in character and subject to annual flooding.

2.1.2 Socio-economic Profile

Socio-economic profile of the project area of Group-A has been revealed from the Socio-economic survey of households. Five percent households of the Study Area were surveyed by random sampling and following broad information has been gathered through it.

a. Family Size

It is found that the family size varied widely, from 1 to 12 or more though families of 4-6 members are more common in the study area. Most of the families are unitary type, though a few joint families are also found.

Table-2.1 Family size of the study area (in percent)

Family size	Sonargaon	Kaliganj	Joydevpur	Tongi	Rupganj	Total
1-3	18.0	10.4	21.3	21.6	17.6	18.9
4-6	64.4	66.3	63.7	65.0	64.4	64.5
7-9	13.9	17.7	11.9	10.9	14.8	13.3
10-12	3.0	5.3	2.6	2.3	2.8	2.9
13-15	.3	.3	.4	.3	.4	.4
16-18	0	0	.1	0	.0	.0
19=>	.3	0	0	0		.0
Total	100	100	100	100	100	100

Source: Socio-economic survey, 2005.

b. Age and Sex Structure

Age and gender distribution is a key variable that indicates the possibilities of natural growth of population of the study area without migration (in or out). The data collected from sample survey and the corresponding population pyramid are shown in Table-2.2 and fig. 2.1.

Table-2.2: Age and sex structure of the population (in %)

Age group	Male (M) %	Female (F) %	Total (T) %	Rural area of the project			Municipal urban area of the project		
				M	F	T	M	F	T
0-4	4.69	4.43	9.12	4.59	4.36	8.95	4.89	4.58	9.47
5-9	5.38	5.05	10.43	5.33	4.92	10.25	5.50	5.30	10.81
10-14	5.48	5.35	10.83	5.69	5.39	11.08	5.03	5.27	10.30
15-19	5.61	5.64	11.25	5.81	5.56	11.37	5.20	5.79	10.99
20-24	4.96	5.31	10.27	4.98	5.06	10.04	4.92	5.83	10.75
25-29	5.10	4.72	9.82	5.16	4.55	9.72	4.99	5.06	10.05
30-34	3.88	3.34	7.22	3.84	3.30	7.13	3.98	3.43	7.41
35-39	4.16	3.60	7.76	4.01	3.42	7.43	4.48	3.99	8.47
40-44	3.09	2.53	5.62	3.04	2.55	5.59	3.21	2.50	5.71
45-49	2.81	2.45	5.27	2.76	2.44	5.20	2.93	2.48	5.41
50-54	2.21	1.73	3.93	2.25	1.82	4.06	2.12	1.53	3.65
55-59	1.59	1.15	2.74	1.70	1.20	2.90	1.35	1.06	2.40
60-64	1.41	0.97	2.38	1.45	1.10	2.54	1.31	0.71	2.02
65+	2.12	1.24	3.36	2.38	1.35	3.74	1.56	1.00	2.56
Total	52.49	47.51	100	52.99	47.01	100	51.47	48.53	100

Source: Socio-economic survey, 2005.



Fig no. 2.1 Age and Sex distribution in the Project Area

The age pyramid shows a graphic picture of the age and gender distribution of population of the project area and indicates the population of this area to be currently in a state of transition with birth rate falling (indicated by the shortening of the base of the pyramid and also by the shortening of the adjoining row above).

c. Religious Status

Distribution of population by religion in the project area is shown in Table-2.3. Persons of all three religions Islam, Hindu and Christian, are available in the project area; although Muslims overwhelmingly dominate and account for more than 90%. Hindus are around 7% and Christians around 2%. Christians are mostly clustered in Kaliganj Thana, where they account for around 20% of the total Thana population.

Table-2.3: Religious group (in %)

Religion	Sonargaon	Kaliganj	Joydevpur	Tongi	Rupganj	Total
Muslim	94.6	64.6	91.0	96.7	93.4	90.6
Hindu	5.2	15.7	8.3	2.4	6.5	7.0
Buddhist	.2	0	.0	.1	.1	.1
Christian		19.8	.6	.9	0	2.3
Total	100	100	100	100	100	100

Source: Socio-economic survey, 2005.

d. Educational Status

The status of literacy and school attendance of the project area are shown in the following tables.

Table-2.4: Literacy rate in two Pourashavas

Jurisdiction	No. of Mouza	1991			2001			2005	
		Literacy Rate			Literacy Rate			Literacy Rate	
		Male	Female	Total	Male	Female	Total	Male	Female
Joydevpur	31	46.46	33.22	39.84	58.30	61.46	59.88	54.88	45.12
Tongi	33	37.31	25.62	31.47	55.717	59.51	57.611	53.09	46.91
Total	64	41.89	29.42	35.66	57.009	60.48	58.746	53.78	46.22

Source: Socio-economic survey, 2005.

Table-2.5: Literacy rate in rural and urban areas

Jurisdiction	No. of Mouza	1991			2001			2005	
		Literacy Rate			Literacy Rate			Literacy Rate	
		Male	Female	Total	Male	Female	Total	Male	Female
Rural	315	44.88	33.78	39.33	56.354	59.5	57.928	55.53	44.47
Urban	64	41.89	29.42	35.66	57.009	60.48	58.746	53.78	46.22
Total	379	43.39	31.6	37.49	56.681	59.99	58.337	54.95	45.05

Source: Socio-economic survey, 2005.

Literacy seems to have increased uniformly both in urban and rural components of the study area between the two population census 1991 and 2001. Population of 2001 indicates significantly higher female literacy in both rural and urban areas. Due to under coverage, socio-economic survey of 2005 failed to record literacy rate properly and came out with lower estimates of both male and female literacy, particularly female literacy.

e. Occupation / Employment Pattern

From the occupational pattern, it is found that a minimum percentage of people are engaged in traditional professional activities related to agriculture. Business is one of the main occupations of the people of the area and 27.53% people are engaged in it. Service in government / non-government organization is the 2nd highest and about 23% people are involved in this occupation. The percentage of day labor-both agriculture and non-agriculture, is small around 6.3% compared to around 25% for the whole country. Industrial workers account for around 10% of total employment and seem to be growing. Together with transport workers they account for around 15% of total employment. The following Table gives a picture of the current (2005) employment status in the project area population:

Table-2.6: Occupational pattern (in %)

Occupation	Kaliganj	Gazipur	Tongi	Sonargaon	Rupganj	Total
Self employed	0.69	0.67	0.66	3.47	0.93	0.95
Owner-farmer	19.30	13.47	1.08	5.40	8.84	9.48
Tenant-farmer	2.69	2.09	0.46	0.58	1.79	1.62
Agricultural day labor	2.13	1.54	0.38	1.06	0.87	1.11
Non-agricultural day labor	3.76	2.97	5.71	3.09	4.29	4.05
General purpose day labor	2.13	0.69	0.85	0.76	1.52	1.16
Industrial worker	1.32	5.17	13.07	14.27	9.26	8.35
Skilled technician	1.69	1.91	1.64	1.16	1.71	1.71
Rickshaw/van puller	2.26	2.48	3.65	2.12	3.45	2.99
Vehicle (Car/bus) driver	1.25	1.91	2.33	1.35	1.65	1.80
Shop keepers and traders	21.12	25.86	27.98	30.76	30.11	27.53
Office worker-Govt. and autos. corp.	4.70	7.93	5.12	3.76	2.48	4.93
Office worker-Private office	17.42	17.56	20.72	14.95	16.56	17.68
Office worker-NGO	0.56	0.32	0.59	0.39	0.10	0.33
Others (unspecified)	18.98	15.43	15.76	16.88	16.44	16.31
Total	100	100	100	100	100	100

Source: Socio-economic survey, 2005.

Distribution of unemployed persons in the study area is as follows. Unemployment scenario in the study area appears to be high (around 11.3%). Lowest level is found in Sonargaon (around 10.3%) and highest is in Kaliganj (about 12%).

Table-2.7: Distribution of unemployed persons (in %)

Kaliganj	Gazipur	Tongi	Sonargaon	Rupganj	Total study area
12.0	10.5	11.3	10.3	11.7	11.3

Source: Socio-economic survey, 2005.

The distribution of non-labour force categories such as house keeping, student, under aged and old aged. Among those categories, house keeping and student are highest in the Pourashavas named Kaliganj, Gazipur, Tongi, Sonargaon and Rupganj. The under aged and old aged persons are dependent on the employed person in every household. Such dependency is highest in Tongi, Sonargaon and Rupganj area. The under aged persons in those three areas are related mostly with agriculture practice (as a supporting hand of parents).

Table-2.8: Distribution of the non-labour force participants (in %)

Category	Kaliganj	Gazipur	Tongi	Sonargaon	Rupganj	Total
House keeping	42.88	43.14	40.55	41.18	42.77	42.34
Student	41.13	39.61	37.99	36.67	34.34	37.50
Under aged	14.36	16.18	20.31	20.52	20.91	18.68
Old aged	1.63	1.07	1.15	1.63	1.98	1.48
Total	100	100	100	100	100	100

Source: Socio-economic survey, 2005.

f. Monthly Household Income and Expenditure Level

There is good correlation between per capita income and level of education. The lowest per capita income in the project area is earned by the illiterate and highest by technical, college and university educated. Average per capita income in the project area is around Tk 1900 per month, while per capita expenditure is around Tk.1300 as evident from Table-2.9.

Table-2.9: Average per capita income and expenditure with education

Level of Education	Sonargaon		Kaliganj		Joydevpur		Tongi		Rupganj		Total	
	PCI	PCE	PCI	PCE	PCI	PCE	PCI	PCE	PCI	PCE	PCI	PCE
Illiterate	1601	1122	1539	1029	1604	1070	1480	1184	1330	947	1456	1038
Primary & special	1577	1082	1406	1008	1725	1158	1780	1303	1522	1040	1619	1122
High school	2127	1433	1864	1200	2155	1435	2391	1715	1929	1210	2106	1404
Madrasah	2176	1396	1633	1584	1764	1235	1785	1255	1654	1045	1765	1207
Technical Institute	1900	1764	2682	1991	3463	2434	4817	2693	2319	1573	3561	2343
College	2949	1753	2215	1491	2750	1818	3072	2119	2408	1445	2719	1785
University	3514	2248	2156	1679	3148	2216	4360	3134	2616	1696	3370	2361
Total	1894	1273	1707	1151	2074	1387	2202	1593	1669	1102	1920	1306

Source: Socio-economic survey, 2005.

Note PCI=Per Capita Income, PCE=Per Capita Expenditure

Age-income profile of head of households in the study area is shown in the table 2.10. It is observed that there is a positive correlation between income and age in all Thanas of the study area. For earned income, accumulation of experience is the main reason. After certain age, around 50-55, property income serves to take over and acts as the main explanatory variable for rising income and its variations over areas.

Table-2.10: Distribution of per capita income (in Tk.)

Age Group	Sonargaon	Kaliganj	Joydevpur	Tongi	Rupganj	Total
20-24	6520.0	8476.2	6834.9	6676.1	6537.1	6790.8
25-29	6519.7	7451.9	8532.7	7175.7	6084.2	7057.4
30-34	6610.7	7942.9	7833.3	8799.1	7456.3	7841.9
35-39	8736.7	7854.9	8325.3	9245.9	7870.1	8382.1
40-44	9490.4	7759.1	8851.5	10460.4	7585.1	8744.1
45-49	8865.2	8380.2	10147.2	11083.9	8498.8	9603.7
50-54	10713.5	9902.9	10398.8	11667.0	8780.1	10104.3
55-59	12148.1	10420.4	11506.1	12762.5	9239.3	10938.0
60-64	13341.2	11126.2	11798.5	12997.8	10396.7	11587.0
65-69	11740.9	9129.4	11367.4	17286.3	10406.7	11635.8
70-74	14125.0	12233.3	11516.9	13382.8	11361.8	11979.9
75-79	9550.0	11950.0	14038.9	15883.3	13729.2	13681.0
80-84	12000.0	12588.9	12573.1	8633.3	10701.3	11748.1
85-89	0.0	5000.0	12966.7	11800.0	8250.0	9855.6
90+	0.0	8000.0	9850.0	0.	16000.0	11940.0
Total	9269.9	8920.8	9549.2	10202.0	8142.0	9144.9

Source: Socio-economic survey, 2005.

The expenditure pattern of the study area confirms general pattern as obtained through nation-wide household income and expenditure surveys. The component area expenditures also follow the general pattern of expenditures-

the more rural area the higher is the food expenditure ratio and the more urban area a relatively lower food allocation. In the study area, the food ratio is around 58% or in other words, the overall food ratio is around 58% of the total monthly household expenditures. The food ratio is highest in Rupganj (63%) and Sonargaon (60%), the two most rural areas. In Tongi on the other hand, which has the most urban areas, the food ratio is around 52%. Data on monthly expenditure and income enable us to develop distribution of per capita income and expenditure of the study area and its components which is shown in Table-2.11.

Table-2.11: Pattern of household monthly expenditure (% of total earning)

Expenditures	Kaliganj	Gazipur	Tongi	Sonargaon	Rupganj	Average
Food	57.31	57.83	52.57	60.05	63.09	58.12
Water/Elect./Fuel/Tel.	5.12	8.00	9.80	10.77	8.20	8.41
Clothing	4.71	3.54	3.06	3.49	4.09	3.69
House rent	8.59	4.66	9.63	1.59	1.29	5.10
Education	9.05	10.13	10.33	7.68	7.88	9.28
Health	3.49	3.65	3.55	3.86	2.92	3.42
Conveyance	6.38	6.60	6.45	6.31	6.36	6.46
Maintenance	2.53	2.04	1.17	2.36	2.16	1.93
Social Activities	1.61	0.63	1.72	1.83	1.88	1.86
Others	1.19	1.52	1.71	2.05	2.14	1.75
Total	100	100	100	100	100	100

Source: Socio-economic survey, 2005.

Comparison of monthly income with expenditure shows (Table 2.12) that on average monthly saving to be around 46% of monthly income, a fairly high saving propensity. The challenge would be to channelise such high saving in the development of the project area through appropriate incentives.

Table-2.12: Distribution of per capita income and expenditure

Range of per capita income or expenditure (in Tk.)	Per capita income distribution (% of total)	Per capita expenditure distribution (% of total)
0-500	0.7	1.2
500-1000	25.2	39.0
1000-1500	27.0	34.7
1500-2000	19.0	14.5
2000-2500	9.2	5.6
2500-3000	6.0	2.2
3000-3500	3.6	1.1
3500-4000	3.5	0.5
4000-4500	1.2	0.4
4500-5000	1.5	0.2
5000-5500	0.3	0.2
5500-6000	0.7	0.1
6000-6500	0.4	0.1
6500-7000	0.4	0.1
7000+	1.4	0.3
Total	100	100

Source: Socio-economic survey, 2005.

g. Source of Income

Production of agriculture crops and salary are the dominant sources of household income of the people in the study area accounting for around 40% of the total household monthly income. Income from trade and commerce accounts for around 22% of household monthly income. Agriculture as a whole, including crops, livestock and poultry and fish cultivation, accounts for around 14%, while remittances from working members abroad around 5% of the total monthly household income.

Table-2.13: Household monthly income by sources (in %)

Income source	Kaliganj	Joydevpur	Tongi	Sonargaon	Rupganj	Total
Salary	18.93	25.76	31.47	27.01	22.04	25.11
Wages (daily wage)	9.86	9.04	12.45	10.57	14.85	11.82
House Rental	1.11	8.34	16.69	7.44	5.31	8.27
Trade & Commerce	17.17	20.69	23.34	25.73	23.32	22.06
Agriculture Crops	25.85	16.98	2.07	12.43	16.87	14.49
Poultry/livestock	8.75	5.15	0.78	1.08	3.69	3.87
Fish cultivation	0.91	0.86	0.13	0.29	0.10	0.43
Cottage Industries/ Handicrafts	1.50	0.51	0.39	1.65	1.29	0.92
Remittance	9.33	4.89	3.70	5.19	4.21	4.89
Income from the Assets	6.59	7.78	8.98	8.61	8.32	8.14
Total	100	100	100	100	100	100

Source: Socio-economic survey, 2005.

Table-2.14: Income sources (in Tk. / month)

Sources	Sonargaon	Kaliganj	Joydevpur	Tongi	Rupganj	Total
Self Employed	8575.0	12385.7	14512.5	13593.8	8668.0	11007.1
Owner-farmer	8595.7	7742.0	9502.1	11227.1	8317.0	8767.4
Tenant-farmer	6416.7	5849.8	6987.0	8741.7	5840.4	6443.8
Agricultural day labor	8177.8	5512.5	5005.6	4712.5	4748.4	5247.2
Day Labor (Non-agriculture)	4259.4	5280.6	5307.2	4909.6	4856.2	4984.4
General purpose day labor	5328.6	8925.0	5370.0	5370.0	4617.0	5496.5
Industrial Worker	5866.5	6200.0	6129.2	6860.0	6072.6	6230.3
Skilled technician	5916.7	7811.1	6052.6	6531.0	5161.9	5988.2
Rickshaw/Van Puller	4605.6	4486.4	4822.7	5173.5	4830.9	4889.4
Vehicle (Car/bus) driver	8066.7	6600.0	7487.0	7256.6	6872.7	7219.9
Shop keepers and traders	11223.5	10467.0	10666.9	11980.5	9750.7	10665.9
Office worker-Govt. and autos. corp.	12248.2	10635.7	11475.6	12509.4	10550.0	11543.1
Office worker-Private office	7607.4	9016.2	9041.4	9760.6	7752.2	8722.4
Office worker-NGO	6500.0	8575.0	11280.0	11350.0	0	10008.7
Others (Household, old age, etc.)	33340.1	37468.0	34600.0	39517.5	30174.5	34581.8
Total	9269.9	8920.8	9549.2	10202.0	8142.0	9144.9

Source: Socio-economic survey, 2005.

h. Migration

In-and out migration and reasons for migration of household members in the project area are depicted in the following table. The level of out-migration of household members is important as the inflow of remittance indicates. Remittance by out-migrating household members is an important source of household income. (Table 2.13). The survey however did not investigate migration by the entire household.

Table-2.15: Migration status of household members (in %)

Thana	In Migration	Out Migration
Kaliganj	0.53	5.32
Joydevpur	1.71	1.42
Tongi	2.74	1.74
Sonargaon	1.45	1.76
Rupganj	0.54	1.66
Total	6.98	11.89

Source: Socio-economic survey, 2005.

2.1.3 Landuse

The study area (Group-A) is the part of northeastern boundary areas of the Dhaka City, which has not been developed as rapidly as the core of the Dhaka City. Development trend of the area follows along the national, regional and growth centre connected roads. Development activities have been concentrated in four areas like Tongi, Gazipur, Tarabo and Kaliganj where density of population per acre is about 80 persons, other areas are mostly rural and density of population is about 20 persons per acre.

Linear pattern of development of high density has been observed on either side of the Dhaka-Mymensingh Road, This is more prominent in Tongi-Gazipur Chowrasta Road and along the eastern side of Sitalakkhya River because of availability of comparatively high lands. Some development has been noticed in Pubail and Bhulta of Rupganj. Kaliganj shows some scattered development due to the existence of low land in north and Sitalakkhya River in the south. Excepting these, sparsely spotted development is found all over these areas. Those spotted development are available only in highland and hat / bazar areas.

The urban areas of Tongi Pourashava, Gazipur Sadar, Gazipur Pourashava and Kaliganj are the major built-up areas comprising of all kinds of urban landuses. For categorizing landuse pattern of the study area, all landuses were divided into 15 major classes. Table-2.16 and **Map 2.1** present the landuse information of the study area. It is clearly evident from the table that agricultural landuse dominates in a major part of the study area. About 61% (67330.1) of the area is presently under agriculture use. Purbachal New Town occupies substantial area of land (6,025.8 acres) and the area is excluded from the study area. Residential use also occupies a significant quantity of land which is about 23368.5 acres (21.2%). Landuse under water bodies (rivers and a large number of ponds) and road is about 6.1% and 1.5% respectively.

Table-2.16: Existing Landuse Pattern

Sl. No.	Landuse	Area in Acre	%
1.	Agriculture	67330.1	61.0
2.	Residential	23368.5	21.2
3.	Water Body	6715.6	6.1
4.	Vacant Land (With Purbachal)	6025.8	5.5
5.	Commercial Activity	3072.0	2.8
6.	Circulation Network	1617.6	1.5
7.	Community Service	912.9	0.8
8.	Restricted Area	397.6	0.4
9.	Manufacturing and Processing Activity	385.0	0.3
10.	Service Activity	242.5	0.2
11.	Mixed Use	210.7	0.2
12.	Governmental Services	50.8	0.0
13.	Transport & Communication	47.8	0.0
14.	Recreational Facilities	15.1	0.0
15.	Non-Government Services	0.8	0.0
16.	Total	110392.8	100.0

Source: Landuse Survey, 2006.

Major existing landuse patterns are described below:**a. Agriculture Areas**

Excepting Tongi Pourashava, Gazipur Sadar, Gazipur Pourashava and some part of Kaliganj and Gacha union, most of the lands of Group-A are predominantly of agriculture use. From Table-2.16, it is clearly evident that agricultural land use dominates a major portion of the study area. About 61% (67330.1) of the area is presently under agriculture use.

The agricultural land is considered as non-urbanized areas. Those areas are in the north and south of the Baria Union, north, south, east and west of the Pubail Upazila, all the lands of Nagori and Daudpur Union, south and west part of Tumulia Union, south of the Purbachal neighbourhood including Kaetpara Union, Sadipur, Jampur and Murapara Union. The Structure Plan considers some union level development areas as growth centers with urban character. Except those growth centers, rest of the areas are considered as agriculture areas in the Detailed Area Plan.

In the study area there are lowlands, beels, flood-flow and sub-flood flow zones of the Sitalakkhya, Balu and old Brahmaputra Rivers and their tributaries, where any development other than agriculture, fisheries, cause-ways, landing stations and brick fields are restricted. Plan Policy RS/1- Areas of High Agricultural Value, reasons and means of implementation clearly specify and discuss the issues (Structure Plan, page 50).

b. Residential Areas

Residential land occupied 23368.5 acres (21.2%). The survey indicates residential category as the second major dominated landuse. As per area-wise statistics, Tongi Pourashava, Gazipur Pourashava, Gazipur Sadar, Kaliganj and Rupganj occupied 12%, 14%, 37%, 3% and 31% land respectively for residential purposes. Baidyer Bazar (in Sonargaon) area covered only 3% of total residential land.

Residential use includes urban housing, rural homestead, flats or apartments, mess / boarding houses and informal housing (comprising thatched, katcha and semi-pucca structures) areas. Most residential areas are informal type i.e. not developed in a planned way.

Residential developments in the Study Area have been developed sparsely following some degree of uniformity. High concentration has been found in Tongi Pourashava, Gazipur Pourashava and in Baidyer Bazar (in Sonargaon) Thana along the highways and railway track. Very low concentration was identified in Bakterpur, Nagori, Tumulia, Kayetpara, Jampur and Sadipur Unions of Rupganj, Sonargaon and Kaliganj Thana

Some narrow canals in the northern part of the Study Area in Gazipur, Tongi-Gazipur Fringe (Gacha and Pubail) and Tongi provides some low lands to preserve surface water.

Residential establishments are seen along such low lands with linear buildings in high lands in Baria, Nagori, Daudpur and Rupganj.

The Sitalakkhya River in the south of the Study Area, divides residential establishments in its western and eastern side. Very low concentration is found in the western side and very high concentration in eastern side of the River. Moreover the contour of the Study Area from high level land to low level land influences residential establishments as high concentration in high level lands and low concentration in low level lands.

Bangladesh Population Census 2001 indicates 73% of the housing as katcha or semi-pucca in the study area. Most of those housing has been provided by the private sector. Government's role is in the provision of housing for government employees and in case of service plots for middle to upper income groups through different authorities are not present. Only the National Housing Authority provides housing for low-income group.

c. Water body

Such type of landuse is found all over the study area. Water body like river, pond, ditch and canal encompass almost 6715.6 acres of the study area where 39% and 23% are under Rupganj and Gazipur Thanas respectively. Beside these, coverage of this type of landuse for Tongi Pourashava, Kaliganj and Gazipur Pourashava are 13%, 12% and 10% respectively.

d. Industrial Areas

Industrial use is one kind of dominating landuse in Tongi and Gazipur area, but a small quantity of land (385 acres or 0.55%) of the study area is covered by this category. This category includes different types of industries such as large scale, medium scale and small-scale. Various categories of industries include Metal Industries, Garments, Jute, Textile, Spinning, Pharmaceutical, Drugs and Medicine, Food manufacturing industry, Leather industry, etc.

About 92% of the total industrial use of the area is found in the Tongi Pourashava. Tongi-Gazipur corridor is the major industrial hub. Rupganj area covers only 6% industrial land where medium and small-scale industries exist. From the physical feature survey, it is revealed that the total number of buildings for industrial use is 1,538. Out of these, heavy, medium and light industries are 407, 491 and 640 respectively. In Gazipur Sadar, only 2% land is under industrial use. The industrial landuse is not prominent in other parts of the study area.

e. Commercial Areas

Commercial landuse is not significant in this area. Only 3072 acres (2.8%) commercial land is found in the Study Area. Prominent landuse under this category are retail and wholesale shopping which is found along the major roads. Most of retail shops, shopping centers, bazars and wholesale markets are existing in two Pourashavas named Tongi and Gazipur. Extent of commercial landuse depends on the size of consumers. As the largest industrial area, Tongi conceived more urban population than Gazipur Sadar; most of the commercial activities are agglomerated in Tongi Pourashava area where 59% of total commercial landuse of the project area is existing. Gazipur Pourashava covers only 18% land for commercial purposes.

Different types of commercial structures such as pucca, semi-pucca and katcha have been identified by the physical feature survey. Commercial structures vary in dimension, size and shape and storey heights. Total number of pucca, semi-pucca and katcha commercial structures are 682, 6815 and 48 respectively.

f. Education and Research

Total area under this use is 904.33 acres (0.82%) of the study area. Education and research institutions are mainly found in Gazipur Pourashava and Gazipur Sadar Thana areas. Only Gazipur Pourashava accounts for 88% of total land under this category. Major education facilities in the area include primary school, high school and college. Besides, government institutions like BARI, BRRI, DUET, T&T Staff College, CERDI, Agriculture College of Salna and some other training centers exist in the study area. In other areas such as Kaliganj and Sonargaon, the landuse under educational facilities are not prominent.

g. Amenities and Urban facilities

Amenities include post office, T&T Exchange, fire service, electricity sub-station, bus terminal, truck terminal, water supply, launch / boat ghat, ferry ghat, container port, waste treatment plant, dumping site, all kinds of assembly hall, etc. This category constitutes about 15.1 acres of land in the study area.

Different type of service facilities like bank, tubewell, police station, powerhouse, godown and fire service are worth mentioning. About 17 banks and 13 post offices have been found in the study area. There exist a total of 7 police stations in the study area of which 3 are in Tongi Pourashava area and 4 are in Gazipur Pourashava area. About 58 acres of land of this category is observed in the study area. Major power supply stations are being spread all over the study area and total numbers are 32.

The figure shows that the service facilities in the study area are very poor. In Tongi and Gazipur there are some urban facilities which are mentionable but not sufficient. In Kaliganj, Rupganj and Sonargaon urban service facilities are very meager.

h. Mixed-use

Mixed-use areas are those areas where, either commerce is mixed with residence or residence with commerce or residence with office or admixture of all the three. Sometimes small processing plants are also found to co-exist with any one or all of the above landuses. However, other admixture of diverse landuses is also found. Mixed landuse is a common character of all unplanned urban centers in the country. Degree of such admixture depends on the specific location of the area. If the area is closer to the city centre than more profitable landuse takes over the less profitable ones and co-existence of diverse landuses prevail for long till one fully takes over the other. In such areas usually commerce gradually takes over residential use. In the study area, Mixed use (Residential + commercial + light industry) areas are 14.89 acres and Mixed use (Residential + commercial) 3.02 acres. About 96% mixed-use areas are found in the Tongi Pourashava and 3% in Gazipur Pourashava.

i. Historic

There are two eminent historic sites of heritage and archaeological value located in the study area. Bhawal Rajbari is located in Gazipur Sadar and occupy 3.2 acres of land. This is presently being used as D.C. office complex. Another historic place is located at Murapara known as Murapara Zamindar Bari. This is presently used as Murapara Degree College. Murapara college occupies an area of 7.38 acres of land. Both of them are aesthetically beautiful with good communication network.

j. Forest areas

This category includes National Park, botanical garden, urban forest, roadside forestry and orchard garden. About 31.77 acres (0.03%) of land is covered by this category. Major part of this landuse is found in Ward no 02 of the Gazipur Pourashava. Bhawalgarh forest is the largest forest area and included in the forest landuse category. No other important forest is found in the study area.

k. Public Gathering

Public gathering places are where public congregates occasionally or for many other purposes like Eid festival, political meeting, annual fair, etc. Tongi Biswa Estema is a big public gathering place for religious purpose. World's second largest assembly of Muslim devotees is held in Tongi area next to Cabla Moydan every year for religious purpose. Biswa Estema occupies an area of about 60 acres. Another public gathering place is located in Gazipur Sadar area named Mukta Mancha. Several cultural meetings are regularly held in this place a number of times in a year. Public meetings and political rallies are also held in this place.

L. Vacant Land

Vacant or Un-used land is an important characteristic feature of urban area. This category includes fallow land, low land areas, char land, etc. The un-used land within the study area is about 6025 acres. Purbachal Housing of RAJUK dominates the most part in this vacant land.

2.1.4 Infrastructure

a. Circulation Network

In order to plan the transport network as part of the Detailed Area Plan of Group-A, a brief assessment of the strategic network of existing road, rail and water transport was conducted. An extensive review was also undertaken of the higher level-planning framework provided by the 1959 Master Plan for Dhaka City, Dhaka Metropolitan Development Plan (DMDP) of 1995-2015 as well as the Strategic Transport Plan (STP) of 2006 for greater Dhaka.

Road network

A number of roads of different categories namely national highway, regional highway, Zilla roads pass through the area covered by Group – A. A number of associated facilities such as bus and truck terminals, railway stations etc. are also located within the study area.

All categories of roads including tertiary and access roads cover an area of 2045 acres (1.86%).

Out of 2076 km. of road network in Group-A, 393 km. is pucca (bituminous roads), 442 km. semi-pucca (Herring Bone Bond) and 1241 km. katcha (earthen road). Major part of the pucca roads (132 km) is in Gazipur Pourashava followed by Rupganj Thana where 120 km. pucca roads exist. Condition of those roads varies widely in different locations. Gazipur and Tongi Pourashavas together has 347 km. of semi-pucca roads, remaining katcha roads are earthen. Gazipur area has highest concentration of katcha roads (524 km). Most of the roads in urban areas are pucca and in the rural areas of Sonargaon, Rupganj and Kaliganj the roads are katcha. Further details of different categories of roads are indicated below.

National Roads: Several national highways such as Dhaka – Chittagong (NH1), Dhaka – Sylhet (NH2) and Dhaka – Mymensingh (NH3) pass through the study area in different directions (north, south, east and west). All national highways are in good condition and maintained by the Roads and Highways Department (RHD).

While NH1 (Dhaka – Chittagong highway) is already under up-gradation to 4-lane highway, the NH2 (Dhaka – Sylhet highway) was recently reconstructed as 7.3-metre wide paved road with hard shoulders on both sides. The NH3 (Dhaka – Mymensingh highway) has also been improved to a 4-lane highway from Dhaka to Gazipur and beyond.

Regional/Zila Road Network: One of the major regional highways (R-301) from Tongi to Ghorashal via Kaliganj passes through the heart of the study area. The road was improved to 5.5m wide paved roads excepting around 8 km. at Tongi end. A 7 km. long new Kaliganj by-pass road was also constructed as an approach road to the new Shahid Maizuddin Bridge at Ghorashal as a part of the regional road. This regional road provides a short-cut alternative to the traditional entry point to Dhaka through Kanchpur, particularly for destinations in the northern part of Dhaka city (comprising Gulshan, Banani, Baridhara and Uttara).

Another important regional highway which passes through the study area, is the Dhaka By-pass road which is under construction. This new by-pass road would provide a short-cut link between Dhaka-Chittagong highway and Jamuna Bridge. The Kanchan Bridge was constructed on this Dhaka By-pass road. The Dhaka By-pass road passing through the Purbachal Residential Area crosses Tongi-Kaliganj regional road before meeting Dhaka-Mymensingh Road at Board Bazar. Width of the Dhaka By-pass Road is 7.3 meters and it is provided with hard shoulders. Around 56 km. of regional roads serve the study area.

Rural Katcha Road: All earthen roads in the category of Upazila and Union roads are being accounted for as rural roads and the total length of those rural roads in the study area is 1241 km.

Railways

Railway-related physical facilities and services in the study area are provided, operated and maintained by the Bangladesh Railways (BR) under the Ministry of Communication. Within greater Dhaka, the railway passes in a north-south direction from its southern most terminus point in Narayanganj, northward to Tongi where the railway branches eastward and another line continues northward and also branches off westward after Gazipur (Joydevpur). All of the rail stations, within Dhaka, are generally well served by a variety of transport modes including buses, taxis, auto-rickshaws and rickshaws. A modern large capacity ICD at Dhirasram, located between Joydevpur and Tongi, within Gazipur district, has been planned for construction.

Two major railway lines namely Dhaka-Chittagong and Dhaka-Mymensingh pass through the northern part of the study area, and there are two important railway junctions in the study area, namely Tongi and Joydevpur. Just north of Tongi station, a fly over is under construction along regional highway (R-301). Once this fly over is completed, traffic congestion across railway level crossing there would drastically reduce. Work related to double tracking of

Tongi-Bhairab Bazar section has also been taken in hand under ADB financing, with a long term plan in keeping provision for conversion of the new Tongi-Bhairab Bazar section into dual-gage in the near future.

There was a great demand for a flyover on Joydevpur Rail Crossing from the local agencies, primarily the Pourashava. But based on a traffic study of the intersection, a flyover could not be justified because most of the users were rickshaws. Recently with the extension of dual-gage track from Joydevpur to Kamlapur, intensity of rail traffic at Joydevpur has reduced drastically. As such justification for a flyover has further reduced for the time being

Waterways

A number of rivers namely Sitalakkhya, Balu, old Brahmaputra and Tongi surround the study area. A large number of canals also pass through the study area. Due to heavy rate of siltation, most of the rivers and canals have lost their navigability. They are also polluted by the discharges of industrial wastes. Rivers and canals are encroached by permanent and temporary structures at several points. Total length of rivers and canals in this study area is 31 km. and 259 km. respectively. The main river in the study area is Sitalakkhya which provides 22 km water ways.

Rivers are extensively used by various water transports to carry goods and passengers. A major road ferry maintained by RHD across the Sitalakhya River at Murapara in Rugganj Upazila, exists with pontoons providing the landing facilities on both sides. There is only one ferry, which is operating between the two sides of the river. It can carry about 5-6 vehicles, and it provides services in both directions. It operates during the entire day (from morning to evening) and on average carries about 130-150 minibuses, 30-40 cars, 2-3 trucks and occasionally a bus. Passengers also use this ferry for crossing the river. The ferry makes around 60 trips (both ways) daily and carries around 1500-1700 passengers per day.

b. Drainage

Drainage and Irrigation Projects:

Narayanganj-Narsingdi Irrigation Project - Demonstration Unit

The Demonstration unit is located in Group-A planning area. The area of demonstration unit is 1300 Hectare or 3250 acres situated mainly in Tarabo union of Rugganj Thana. It is a Flood Control Drainage and Irrigation project of Bangladesh Water Development Board (BWDB). Although the area is under DMDP but demarcated as agricultural land, and conversion of these land to other than agriculture is restricted. The project has a pump station at Jatramura on Turkir khal. Also it has drainage khals, irrigation canal, bridges, culverts, sluice gates, irrigation in-lets, embankments, etc.

Narayanganj-Narsingdi Irrigation Project - Block-I

Block-I is also located in Murapara and Bhulta unions and north of demonstration unit. Its area is 3000 hectare or about 7500 acres and is a flood control drainage and irrigation type project of BWDB. The area is under DMDP but demarcated as agricultural land and conversion of these lands to other than agriculture is restricted. The project has a pump station at Baniadi and has all kinds of infrastructures related to drainage and irrigation.

North Rugganj Flood Protection Drainage and Irrigation Project

North Rugganj flood Protection Drainage and Irrigation project of BWDB is located in Tumulia Union of Kaliganj Thana. It is a flood control drainage and irrigation type project of BWDB. It is similar in size and type as Narayanganj-Narsingdi Irrigation Project – Block-I and its pump station is located at Tumulia on the other bank of Sitalakkhya River. The project has all kinds of drainage and irrigation related infrastructures. Physical features survey, field survey and database and maps prepared from these surveys present the details of infrastructures existing in the project. The area is within DMDP but demarcated as agricultural land and its conversion to other than agriculture use is restricted. Policy RS/2-FCDI Project Areas shows reason, means of implementation etc. (ref. Structure Plan, page 50).

Flood Protection: Group-A planning area is just adjacent and outside the proposed flood embankment of FAP-8A. Implementation of FAP-8A embankment will cause adverse hydraulic effects in Balu and Sitalakkhya Rivers. Flood flow, water levels and flood flow zone will increase and erosion, sedimentation and flood frequency will also increase.

These issues are carefully examined and addressed with necessary structural measures. The unprotected side of the Balu River, Tongi khal and both sides of the Sitalakkhya River within the study area may require embankments to keep the proposed planning area flood free. Otherwise this area can not be brought under development and are to be left as it is now as flood flow, sub flood flow zone or as wetland zone.

C. Utility Services

Water supply: According to the population of the Gazipur Pourashava core area, 1,87,500 people are enjoying piped supply water facilities from 7 pump houses (DTW). Daily water production (considering 10 hr. in average pumping hours) is 1.6 MLD per Deep Tubewell. Hence, total production for the area is 11.2 MLD. At present, 5 tubewells are in operation and water production stands at 8 MLD. According to the projected population, 28 MLD (considering average consumption @150 L/P) is needed. Additional 20 MLD water production is required per day, which will be fulfilled through further installing of 13 nos. of DTW.

For the Tongi Pourashava area, 22 nos. of DTWs are in operation and 2 nos. of DTWs are to be installed immediately. Beside this, industrial, commercial, educational and other private organizations have their own arrangement for water supply through DTWs installed at their own premises. Other than Gazipur and Tongi Pourashava, the rural areas such as Gazipur Sadar, Kaliganj, Rupganj and Sonargaon deep-set hand tubewell is the main source of water for drinking and cooking purposes. People of those areas use natural surface water from ponds, khals and rivers for bathing, washing and agricultural purposes. No arsenic contamination water has been detected in those areas.

In Gazipur Sadar, Kaliganj, Rupganj and Sonargaon area, deep-set hand tubewell is common source of water. About 7,418 nos. of hand tubewells are found in the study area provided by the Department of Public Health Engineering (DPHE), NGOs and private initiatives. In rural areas of the Group-A, most of the people are using the natural water from well (Kua), ponds, khals and rivers other than drinking water. They collect drinking water from the community deep-set hand tubewells provided by the different organizations and NGOs. Almost 36% of the people use self-owned tubewells and rest 64% use community shared tubewells.

Water supply (Gazipur Pourashava)

Problems of water supply in the Gazipur Pourashava are:

- Shortage of Deep Tubewells in operation with respect to the requirement of water supply for the households of the area.
- Water distribution pipelines do not cover all the holdings within the area.
- Many Deep-set hand tubewells, private owned or on community basis, are out of order due to drop in underground water layer.
- Pump houses and deep tubewells and water distribution pipelines are not maintaining properly.

Water supply (Tongi Pourashava)

Problems of water supply in the Tongi Pourashava are:

- Shortage of DTW in operation with respect to the requirement of water supply for the households of the area.
- Many deep-set hand tubewells are private owned or on community basis, most of them are out of order due to downage of water layer.
- Some Deep tubewells of pump houses are not in operation or in partial operation due to downage of underground water layer.
- Pump houses and deep tubewells and distribution pipeline are not maintained properly.

Water supply (Rupganj, Kaliganj and Baidyer Bazar)

Problems of water supply in the Rupganj, Kaliganj and Baidyer Bazar Upazila are:

- Absence of water supply by DTWs and water supply distribution network in these areas.
- Deep-set hand tubewells are private owned or on community basis, most of them are out of order due to downage of underground water layer.
- Natural water of ponds / canals / khals and rivers are not drinkable due to heavy pollution.

Electricity: All urban areas are enjoying electricity facility. For lighting, more than 90% of the households use electricity, while less than 10% are using kerosene burners as source of light. Electricity mainly supplied in the study area by DESA/ DESCO/ PGCB/ REB / PBS through 132/33 kv grid sub-station and 33/11 kv sub-station, grid-towers and distribution poles are located at different places in the study area. Consumption of electricity in the study area has increased rapidly due to rapid increase of residential buildings and commercial and industrial plants in Tongi and Joydevpur area. The electricity supply in this area is less in respect to the load demand.

Taking survey data from Gazipur Pourashava PBS, the total electrical load required for Gazipur Pourashava area is about 120 MW, whereas, at present, electricity supply is 40/45 MW. So, about 66% to 75% load is covered by load shedding in different areas. For Tongi Pourashava area, required electrical load 106 MW but present electricity supply is 30/ 35 MW. So, about 66% load is covered by load shedding in the areas. Due to presence of frequent load shedding in this area, the household dweller and commercial and industrial sector suffers badly and it causes great economic fall to the industrial sector. In the urban area, deep tubewells in the pump houses can not supply water up to the mark, which causes shortage of water supply and bring sufferings to the people.

Telecommunication: Telecommunication system of the study area is provided and maintained by BTCL (formerly BTTB), through telephone exchanges located at different places. There are 7 (seven) telephone exchanges with large capacities. Instead of telephone, now a day, mobile phone network has developed in the area by some private mobile organization like Grameen Phone, City Cell, Aktel(Robi), Banglalink and Teletalk of BTCL. With the rapid increase of population in the study area, demand of telephone services increased rapidly. Now-a-days demand of telephone connection from BTCL decreased due to the use of mobile phone among the people.

Natural Gas: Gas supply is available in almost entire urban locations within the study area. In Tongi and Gazipur Pourashava area, gas supply is provided by TITAS Gas Transmission and Distribution Co Ltd. (shown in the map enclosed). In Tongi and Gazipur Pourashava area, gas source is from Joydevpur CGS (City Gate Station). There are two DRS (District Regulation Station) in Joydevpur and Tongi. The gas transmission and distribution through feeder lines to consumers is by different sizes of pipelines and of different pressure ratings. Beside Tongi and Gazipur Pourashava area including commercial area, urban area of Gazipur Sadar, Kaliganj, Rupganj and Sonargaon area is partly provided with gas connection by TITAS Gas Transmission and distribution Co. Ltd. There are 1,41,323 structures in the study area connected with gas connection, composed of pucca, semi-pucca and katcha structures and they are 8608, 1,24,358 and 8357 in numbers respectively. Most of the buildings in the industrial, educational institution, CNG refueling station are provided with gas connection.

2.1.1 Land Ownership and Land Value

A mouza based table of Land Value of the Study Area is presented in the Table-2.17 collected from sub-registry office of Tongi and Gazipur. Land value varies from area to area on the basis of land's location, population density, land level, neighboring establishments, and such other factors. Such factors are categorized into *viti*, *chala*, *shail*, *baid*, *aman*, *nal*, *bor*, *khama*, *pukur*, *doba*, *tek*, *aush*, *bagan*, etc. land types. Land value of *viti* type land is identified as the costliest land in most cases in the Study Area. *Chala* and *Shail* type land are also of significant cost in comparison to *viti* type land. *Doba*, *khama*, *bor* and *tek* type land are in the line of lowest value land in the Study Area.

In Tongi, land value of *viti* type land is identified as the highest. Land value of Tongi mouza is the highest among all mouzas in Tongi. The value of *viti* type land is about BDT four lacs per decimal in Tongi mouza and even land value of *aman* type land is also about BDT three lacs which is higher than most *viti* lands in the Study Area. Average land value in Andarul mouza in Tongi is the lowest among the mouzas enlisted in the Table-2.17.

In Tongi-Gazipur Fringe, land value of *viti* type land is identified as the highest. Land value of Pubail, Kunia and Gachha mouza is the highest among all mouzas in Tongi-Gazipur Fringe. The value of *viti* type land is about BDT one lac per decimal in Pubail mouza. *Chala* and *shail* type land is of higher value than *viti* type land in Kunia and Gachha. *Chala* and *shail* type land in Kunia mouza is about BDT 80,000 per decimal, which is significantly higher than *viti* (BDT 61,538) type in the same mouza. Land value for *doba*, *bor* and *pukur* type lands are of lowest value in Tongi-Gazipur Fringe.

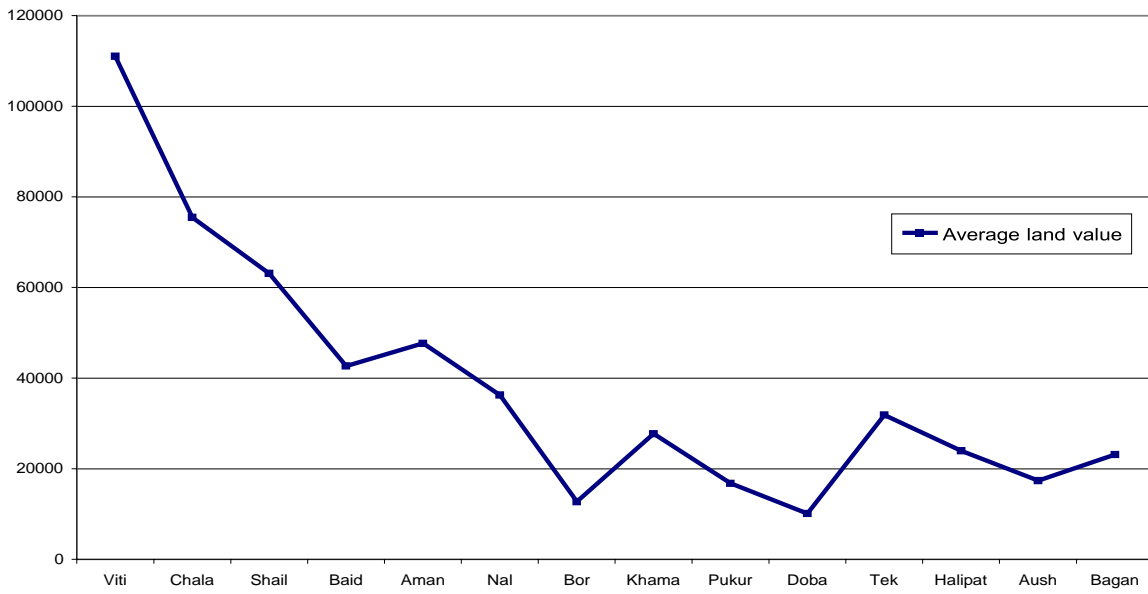


Fig 2.2: Average land value for different types of Land in the Study Area (Group A)

In Gazipur, land value of Joydevpur mouza is identified as the highest among all mouzas in Gazipur. The value of *viti* type land is more than BDT one lac twenty thousand per decimal in Joydevpur mouza. *Chala* and *pukur* type land is also more than BDT one lac per decimal in Joydevpur. Land value of Vurulia and Chapulia mouza are almost similar for all types of land. Land value for *doba*, *bor* and *khama* type lands are of lowest value in Gazipur.