

A STUDY ON THE IMPACT OF THE 2ND BURIGANGA BRIDGE
ON THE PHYSICAL AND SOCIO-ECONOMIC CONDITION OF
KERANIGANJ UPAZILA



MASTER OF URBAN & REGIONAL PLANNING



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CERTIFICATE

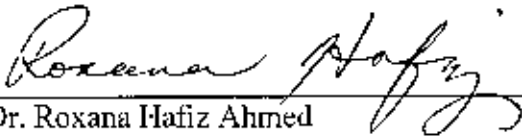
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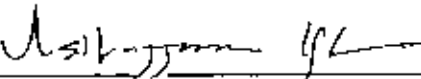
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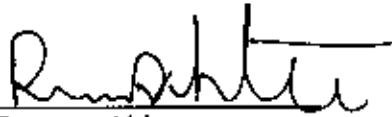
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Abstract

Keraniganj is located very close to the central part of Dhaka city. But its development was hindered due to presence of the river Buriganga as it disconnected Keraniganj from Dhaka. The opening of first Buriganga Bridge in the 90's was the earliest step to connect Dhaka with Keraniganj. But it was not sufficient to reduce commuting time and meet the demand of faster accessibility with Keraniganj.

The 2nd Buriganga Bridge, opened in 2001 created a quick link between Dhaka city and the Keraniganj. After the opening of this bridge, demand for land and price of land, both have been increased in Keraniganj. In addition, basic infrastructural development and increased economic activities instigated by improved communication network through the bridge has provided income opportunities for local people of Keraniganj. This resulted in a rapid change of land use and socio economic strata of Keraniganj specially in the adjacent areas of the bridge. People from old Dhaka and other parts of the country are migrating there for increased business opportunities and low cost accommodation facilities. Land developers and real estate agencies are rushing there to make profit utilizing the increased demand of plot and flat. But the situation is not same for all parts of Keraniganj. Areas far from the Bridge are not directly benefited by this changing agent. Again, the bridge has brought negative consequences in the commercial centers located at the Dhaka end of the Bridge. It has reduced income and employment opportunities of the *ghat* workers. Most of them have shifted to other professions.

The rapid development which is now occurring in Keraniganj is mostly haphazard and without considering planning or environmental requirements. If the situation continues, potential areas of Keraniganj like Suvadda, Chunkutiya, Golam Bazar, Aganagar, Kaliganj will turn to densely populated unplanned areas like other parts of Dhaka.

The study focuses on the existing trend of development of Keraniganj specially after the opening of the 2nd Buriganga Bridge. The bridge has opened a greater scope for using the full potential of Keraniganj. The study identified the major impacts of the bridge on the overall socio economic condition of Keraniganj and also some opportunities for guided development. The study findings and recommendation may guide the future work for further development of the area and guide the existing unplanned ones.

ABBREVIATIONS

BIWTA	Bangladesh Inland Water Transportation Authority
BWDB	Bangladesh Water Development Board
C.S.	Cadastral Survey
DAP	Detail Area Plan
DCC	Dhaka City Corporation
DPHE	Department of Public Health Engineering
DoE	Department of Environment
DDC	Development Design Consultants Ltd.
DMDP	Dhaka Metropolitan Development Plan
ECNEC	Executive Committee of National Economic Council
FAP	Flood Action Plan
FAP-8A	Flood Action Plan Component 8 A
FAP-8B	Flood Action Plan Component 8 B
GIS	Geographical Information System
GPS	Global Positioning System
HH	Household
JICA	Japan International Cooperation Agency
LGED	Local Government Engineering Department
PDB	Power Development Board
RAJUK	Rajdhani Ummayan Katripakkha
RAB	Rapid Action Battalion
RHD	Roads and Highways Department
RMG	Readymade Garments

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Chapter 1: Introduction

1.1 Background

The growth of Dhaka is historically related with water way. Buriganga has played a vital role for the successive development of the city. From the very beginning, the southern bank of Buriganga, Keraniganj, has been acting as a service zone for Dhaka City. Though it is located near the capital and large industrial town Narayanganj, it has always been under their shadows and not a fully-self contained town. Its land use organization and town structure have remained under direct influence of Dhaka City.

To meet the extensive pressure on capital, Dhaka started to expand gradually specially after the Mid 80's. In northern side, expansion occurred faster than the southern side. In southern fringe, the river Buriganga was acting as a strong barrier between Dhaka city and Keraniganj. Before the year 2000, people of Keraniganj had to use traditional boat to communicate with greater Dhaka which was an obstacle to realize its potential for development of trade, commerce, industries in the area. Due to close proximity of Dhaka and Narayanganj, Keraniganj had a greater potentiality to develop township. But the area lagged behind much than these highly commercial areas. Another obstacle of development in Keraniganj was the high vulnerability to flood which restrained industrialization, commercialization and high valued residential development. Gradually the area became a centre for low and middle income people.

The second bridge on the Buriganga was opened on 20 May, 2001. It created opportunities for economic, commercial, industrial and residential growth. The bridge has created multidimensional effect on the people of Keraniganj and their livelihoods. In one side new employment opportunities have been created due to trade, industrialization and commercialization. On the other side most of the people depending on boat and ferry ghat lost their jobs. Land value increased many times and developers, real estate businessmen started to expand their business there. Shop rent, house rent increased a lot. People of Keraniganj felt the 2nd bridge as blessing on the area as it has radically changed the urbanization and communication status of the area. But this change is not equal in all parts of the Upazila. The areas which are far from the bridge and its approach roads, are still lagging behind to keep pace with this new trend.

A spate of development has started in Keraniganj without much consideration of the structure plan and proposals provided by RAJUK for the area after the bridge. Land filling for housing projects and encroachment of water bodies are the outcome of this unplanned urbanization. This has created a new threat for pressure on existing utility, services and facilities. Besides this, haphazard land filling and development have increased water stagnation and vulnerability of flood

The development of Keraniganj should be guided right now without further delay. Planned and guided development can ensure using of high potential of the area. When policy makers concentrates on reducing pressure of Dhaka city, Keraniganj can be a ideal place for substituting many of the uses to relocate there.

1.2 Literature Review and Conceptualization

There are very few scholarly articles on Keraniganj but host of work is done of Keraniganj. This research tried to cover all these reports.

The Engineers Ltd. (1985) conducted the feasibility study on the construction of the 2nd bridge over the Buriganga. They acknowledge absence of bridge as the major barrier for the development of Keraniganj. They identified that the major barriers in without bridge situation and also projected the improved scenario with it. BCL Ltd (1995) conducted a comprehensive study to assess the institutional, technical, environmental and economic viability of a bridge on the Bhairab river. Their study also covers sociological and other changes that may come for a bridge construction in an area.

Hasan (2009) in his M.Sc thesis entitled "Location Analysis of Manufacturing Industries in Keraniganj" have identified the industrialization process of Keraniganj. He has pointed out the trend and factors of industrialization in Keraniganj. The study has also mentioned that improved accessibility after the opening of 2nd Buriganga Bridge has accelerated the industrialization process of Keraniganj. Haque's (1977) work acted as useful guide for comparing the physical status of Keraniganj three decades back with the present scenario. The author made an attempt to develop a planning guideline for Keraniganj. Ahmad (1993) has identified the critical issues of flood prevention measures of Greater Dhaka, implementation status and the impacts of it on the adjoining areas where Keraniganj has also been included. Khan (1991) has included the findings from topographic and geological survey and existing landuse status in 1991.

DDC Ltd. (2000) carefully reviewed the actual status of Keraniganj in physical, social and economic aspects in the year 2000 which was just before the opening of 2nd Buriganga Bridge. They completed this assessment through landuse, physical features and GPS survey. They have also identified critical issues of the area through detail socio economic and institutional analysis.

BWDB (2002) initiated to evict undue possessions around the Bunganga and to enhance overall environmental consideration of the adjoining area. The report was reviewed as part of assessing flood vulnerability of the area and preventing measures. BWDB (2004) enhanced this work through a further study on rehabilitation of the Bunganga-Turag-Shitalakhya river system and augmentation of dry season flow in the Buriganga.

1.3 Objectives of the Study

This research is an attempt to evaluate the land use and socio-economic impact of the bridge on Keraniganj Upazila and formulating a framework for planned development of that area

However, to attain this aim, the following specific objectives have been drawn up:

- a. To investigate the land use and socio economic condition of the surrounding area that existed before the construction of the bridge.
- b. To identify the current status of land use and socio-economic parameters of the area after the construction of bridge.
- c. To provide a set of planning recommendations to improve the area using its potentials.

1.4 Significance of the Study

There have been some studies focused on land use and planning guidelines for Keraniganj but none to assess the impact of the bridge on urbanization and socio-economic condition of the area. The study is an attempt to address the potential and problem of the area which should be guided in an organized manner.

There are several reasons to take the issues seriously. According to the Flood Action Plan 8A, Keraniganj has been treated as the potential Urban Development Area in post 2000. The construction of 2nd Bunganga has enhanced this potentiality as communication with greater Dhaka has been improved. There is no specific guideline for the area considering the present implausible unplanned development in most of the study area. So this research can be a useful support for preparing a planning guide for the development of the area following the Dhaka Metropolitan Development Plan. According to Urban Area

Plan, within 2005 a Detail Area Plan was scheduled to prepare to guide the development of Keraniganj. A draft plan has been prepared by 2008, but meantime bulk development has been occurred in the study area without planning consideration. So this research tried to find out the gap between the formulation and implementation of plans and the resulting scenario.

Providing a detail analysis of the area in context of existing land use, land value, industrial structure and characteristics of agglomeration and socio economic condition of the people, which is the objective of Details Area Planning, has been considered importance of the study at selected location. Hence, taken together analysis of impact of a urban development activity, (i.e. construction of a bridge) and planning for guided development of the area is important enough to justify this study.

1.5 Organization of the Study

The study is organized in to nine chapters as described below:

The first chapter deals with the general description of the topic, objectives and significance of the study.

Chapter two discusses the details of the methodology starting from a brief literature review, data collection to findings analysis, scope and limitation of the study.

Chapter three includes description, historical background, existing policies and plan regarding the study area.

Chapter four has included brief of the 2nd Buriganga Bridge. The issues identified in the feasibility study by the developer, i.e. project background, economic analysis, possible impact have been included in this chapter.

Chapter five analyzes the major impacts of the bridge on Keraniganj Upazila. Besides, physical, social and economic impacts, it has included the environmental issues of the study area.

Chapter six identifies the potentiality and constraints of the study area.

Chapter seven deals with the key findings of the study and a summary of feedbacks received from the residents of Keraniganj area on their livelihood pattern after the bridge.

Chapter eight is an attempt to pull together the findings and discussions in the preceding chapters. Some suggestions for future research and recommendations for possible development of the area have been given.

Chapter nine concludes the study with a brief final comment.

To end with, references and annexation have been incorporated.

Chapter 2: Methodology

Appropriate methodology is the key prerequisite of a quality research work. Any research design must make enough provision for protection against bias and must maximize reliability, with due concern for the economical completion of the research study. The design in such studies generally focuses on the following steps: literature review and conceptualization, research design, formulation of the objective, designing the methods of data collection, selection of the sample, collecting the data, processing and analyzing the data and reporting the findings. The study on the 'Impact of the 2nd Buriganga Bridge on Keraniganj Upazila' has been started with fixing some objectives. Before that, some preliminary assessments were done as ground work. For example, literature review and discussion with resources persons for conceptualization and assessing the possible outcome of the proposed research work. Then a layout was fixed to formulate the research in a systematic way and bring out the appropriate findings. Schematic diagram of methodology has been given in figure-2.1

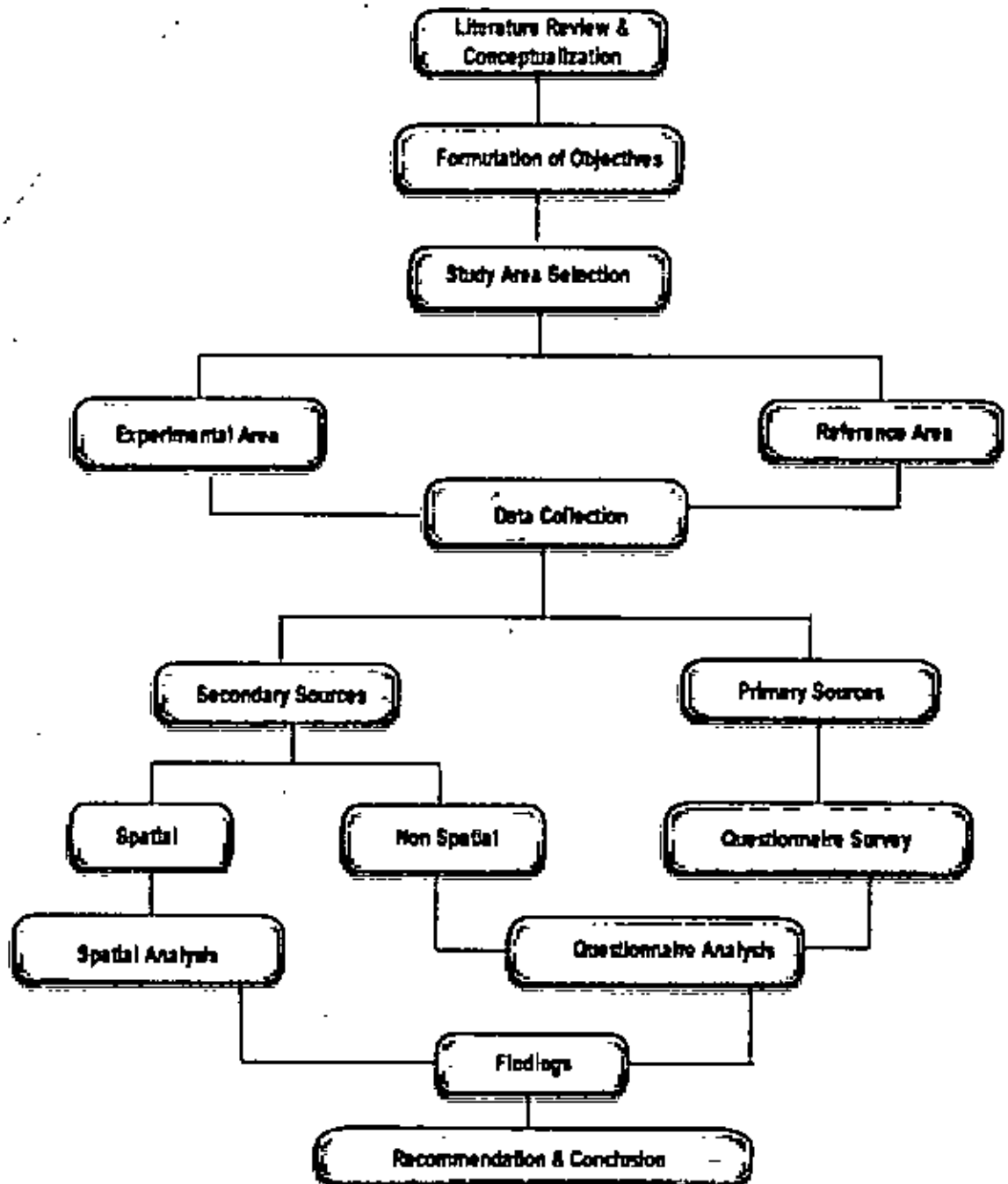
Discussion on literature review and objective formulation have been included in chapter one. Other parts of the methodology are briefed below:

2.1 Selection of the Study Area

To conduct the research, a buffer zone of the bridge has been identified where major emphasis is given to Keraniganj. In this regard, 'After-only with control design' design method was followed. Here, two groups or areas (test/experimental area and control/reference area) were selected. Treatment impact is assessed by subtracting the value of the dependent variable in the reference area from its value in the experimental area. This can be exhibited in the following form:

Experimental area	Treatment introduced	Level of phenomenon after treatment (Y)
Reference area	→	Level of phenomenon without treatment (Z)
Treatment Effect = (Y)-(Z)		

Figure-2.1: Schematic Diagram of Methodology



The basic assumption of this method is that, the two areas are identical with respect to their behavior towards the phenomenon considered. If this assumption is not true, there is the possibility of extraneous variation entering into the treatment effect

To conduct this study, Zinjira *mouza*, which is adjacent area to the bridge, has been taken as **experimental area**. To compare the change which has been occurring due to the bridge, a reference area has also been studied. Atasur *mouza* under Kalindi Union, about five kilometers away from the bridge, has been taken as the **reference area** where there is no significant change due to bridge construction. To identify the impact of the bridge on the northern area (Dhaka end), Badamtoli Ghat area has been studied.

2.2 Data Collection

2.2.1 Primary Sources: Primary data has been collected by physical and socio economic survey. Physical survey included study on existing landuse, commercialization, industrialization, infrastructure pattern, condition of drainage channels and low lands. It also included investigation of the advantages and limitations of the site and probable planning guidelines to use the full potentiality of the area. The survey was guided by a base map received from the engineering section of Upazila Parishad Office.

Questionnaire Survey: A detail questionnaire survey was conducted to find out the possible impact of the bridge construction. To reach into each target group, **stratified random sampling** process was followed for respondent selection. Generally, stratified sampling technique is applied to obtain a representative sample. In this technique, the population is stratified into a number of non-overlapping subpopulations or strata and sample items are selected from each stratum. Here, first stratification and then simple random sampling were done. Three different types of questionnaire were prepared for this survey; one for residents of experimental area and reference area, another for the commercial centers of both areas and the third one is for the commercial centers of northern end of the bridge at Badamtoli ghat, Babubazar. Socio-economic survey was carried out through a questionnaire survey among the different socio-economic strata of Zinjira, Atasur and Badamtoli ghat area. About 300 questionnaires were distributed to the existing household, commercial units and other

relevant parts. Three different types of questionnaires were used for this: one for households, another for commercial units of Zinjira and Atasur and third one is for commercial centres, ghat workers of Badamtoli *ghat*. Land value, shop rent, house rent, occupational pattern and income level of people were investigated and during the analysis phase it was compared to the relevant data before the bridge construction. Details of sampling technique are given below:

Table: 2.1 Sampling Details

Selection Criteria	Percent	No. of Questionnaire Surveyed
Residents (Zinjira)	20	60
Residents (Atasur)	20	60
Commercial Centers (Zinjira)	20	60
Commercial Centers (Atasur)	10	30
Badamtoli Ghat Worker	10	30
Commercial Centers of Babubazar and Ghat Workers (Northern End of the Bridge)	10	30
Local Administration	10	30
Total	100	300

2.2.2 Secondary Sources: Secondary data means data that are already available i.e. data which have been collected and analyzed by someone else. Secondary data may either be published or unpublished. For this study, the secondary sources were the bridge construction company (The Engineers Ltd.), relevant government departments i.e. RAJUK, Geological Survey of Bangladesh, Bangladesh Water Development Board, BCL Ltd., CEGIS, Local Government Engineering Department. Some organizations in Keraniganj were also visited i.e. Upazila Pansad, Thana, Sajeda Hospital etc. Relevant maps e.g. Dhaka District Map, Upazila Map, Mouza Maps, Road Map and useful literature like Census Reports, District Gazettes, Annual Brief Reports of Keraniganj Upazila Pansad, FAP 8A and 8B, DMDP Structure Plan, Urban Area Plan were collected for a thorough study of the project. During research design, it has been checked by caution that, the collected secondary data have the following characteristics. reliability, suitability and adequacy of data.

2.3 Data Processing and Analysis

All the collected data and information have been analyzed to achieve the objectives of the study. Spatial and aspatial analysis have been conducted to assess the changed land use pattern and trend of rapid urbanization of the area. Some statistical software and tools have been used to analyze the data received from field survey.

2.4 Findings

Some specific findings came out through the systematic detail analysis. The findings have analyzed further and compared with the objectives of the study. The findings were analyzed further to bring some key points of the study.

2.5 Recommendation

A set of recommendations has been submitted at the end of the study as ultimate output.

2.6 Limitation of the Study

One of the major limitations of the study area is the unavailability of data. There were some previous studies on the future development of Dhaka District but there Keraniganj has been shadowed down under Dhaka city. Very few similar studies included southern part of Buriganga. It was very difficult to get data of small areas like Atasur and Zinjira, the two *mouzas* of Keraniganj which were taken as the reference and experimental area in this study. An attempt was taken to collect old photos on the physical status of Badamtoli ghat and Zinjira areas to compare with the present scenario. Though, some literature was found, but no similar pictorial presentation was found. The author had to depend on the primary data collected by field survey and discussion with the local people who has long observation on the changes of Keraniganj specially after the opening of the bridges or directly effected by the bridge. A list of entrepreneurs and institutions were collected by the personal initiative throughout the field survey.

Secondly, even the local government authority does not have sufficient data on socio-economic parameters. They couldn't provide updated data on important issues like population, migration scenario, land price, social and economic institutions, industrialization

etc. During data collection, many personnel of the relevant organization were reluctant to provide information.

Again, during data collection phase, an attempt was taken to collect impact of similar projects in and outside the country. Similar local projects were found which has been included in the literature review part. Though some foreign projects were found, but socio economic situation of those countries are so different that these couldn't be used as reference of this study. Among the local projects, feasibility study done by the bridge developing company (The Engineers Ltd., 1985) was important. But another limitation comes from the point that, it covered only the technical and economic aspects related to investigation of bridge construction. No detail assessment on physical, social and environmental status of the area was done which could be compared with the findings of the present study.

Chapter 3: Location and Description of the Study Area

3.1 Background:

With respect of population, Keraniganj is the second largest Upazila of Dhaka district. It came into existence in 1817 as thana and upgraded to Upazila in 1983. Nothing is definitely known about the origin of the Upazila name. It is learnt that there lived an influential man who served as a clerk means *Kerani in* Bengali. He was very kind hearted and friendly. After his death, a trading centre was developed around his graveyard which was popularly known as Keraniganj. Upazila headquarters of Keraniganj is located at Sakta *Mouza* (BBS, 2004).

3.2 Location & Area:

The area occupies an area of 166.87 sq km including 1.4 sq. km. water body and 10.5 sq. km river area. It is at a distance of 15 km from the district headquarters as well as the capital of the country. It lies between 23° 37' and 23° 47' north latitude and 90° 13' and 90° 29' east longitudes (BBS, 2004). It is bounded in the north by Savar, Lalbagh, Kotwali, Sutrapur and Shyampur thanas, on the east by Fatullah thana of Narayanganj Zila, on the south by Serajdikhan thana of Munshiganj Zila, and on the west by Nowabganj Upazila. Keraniganj town stands on the bank of the river Buriganga at the southwest side of Dhaka City. **Map-3.1** and **Map-3.2** shows location of Keraniganj in the context of surrounding Upazilas and in Dhaka Zila boundary.

3.3 Population and Household Characteristics:

The Upazila has a population of 603114 of which 322732 are males and 280382 are females. The average population size of each union, mouza and village are 50259, 5026 and 1429 respectively. The Upazila has 124605 households where 96.29% are dwelling units, 0.77% institutional and 2.94% other units. Density of population is 3614 per sq. Km. The decadal growth rate of Upazila is 13.76% and annual growth rate is 1.30% (BBS, 2004)

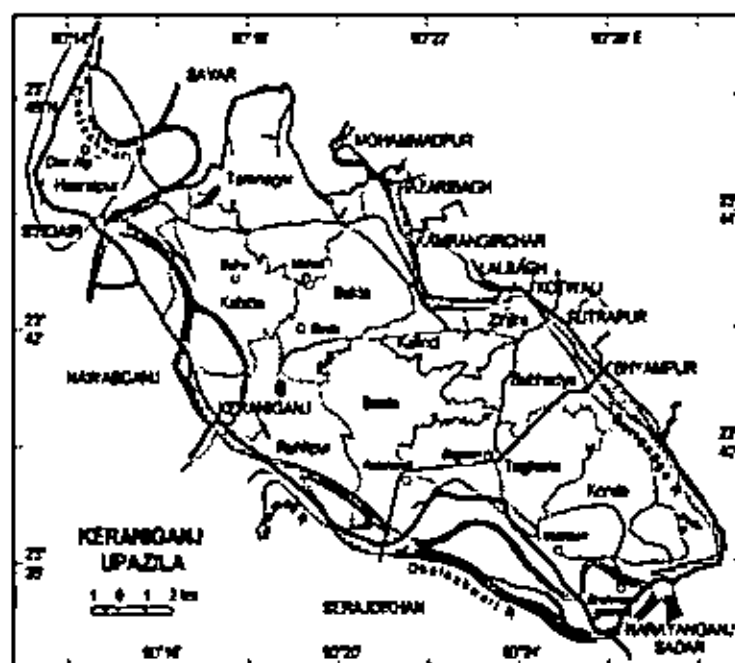
3.4 Union-Ward and Village Characteristics:

Among 19 Upazilas of Dhaka Zila Keraniganj is in fourth position in respect of the area in acre, union and *mouza*. In 2000, the Zinjira union of Keraniganj was divided into two and another new union Aganagar was created. Now the Upazila consists of 12 unions, 122 *mouzas*, and 422 villages which was as follows in 1991: union 11, mouza 122, village 399. Table-3.1 shows administrative units of Keraniganj and the population distribution.

Table-3.1 Administrative Units and Population Distribution of Keraniganj

Unions	Mouza	Population	
		1991	2001
Kalindi	6	30705	35363
Zinjira	4	116886	88572
Suvadda	5	134438	146522
Teghuria	8	28290	31919
Ruhitpur	6	24612	28377
Hazratpur	6	25401	26278
Kalata	17	29913	31180
Taranagar	19	31218	33574
Sakta	12	32764	42807
Konda	23	42215	48866
Basta	13	27741	28721
Aganagar	3	Not declared as Separate Union	59034
Total		5,30,174	6,03,114

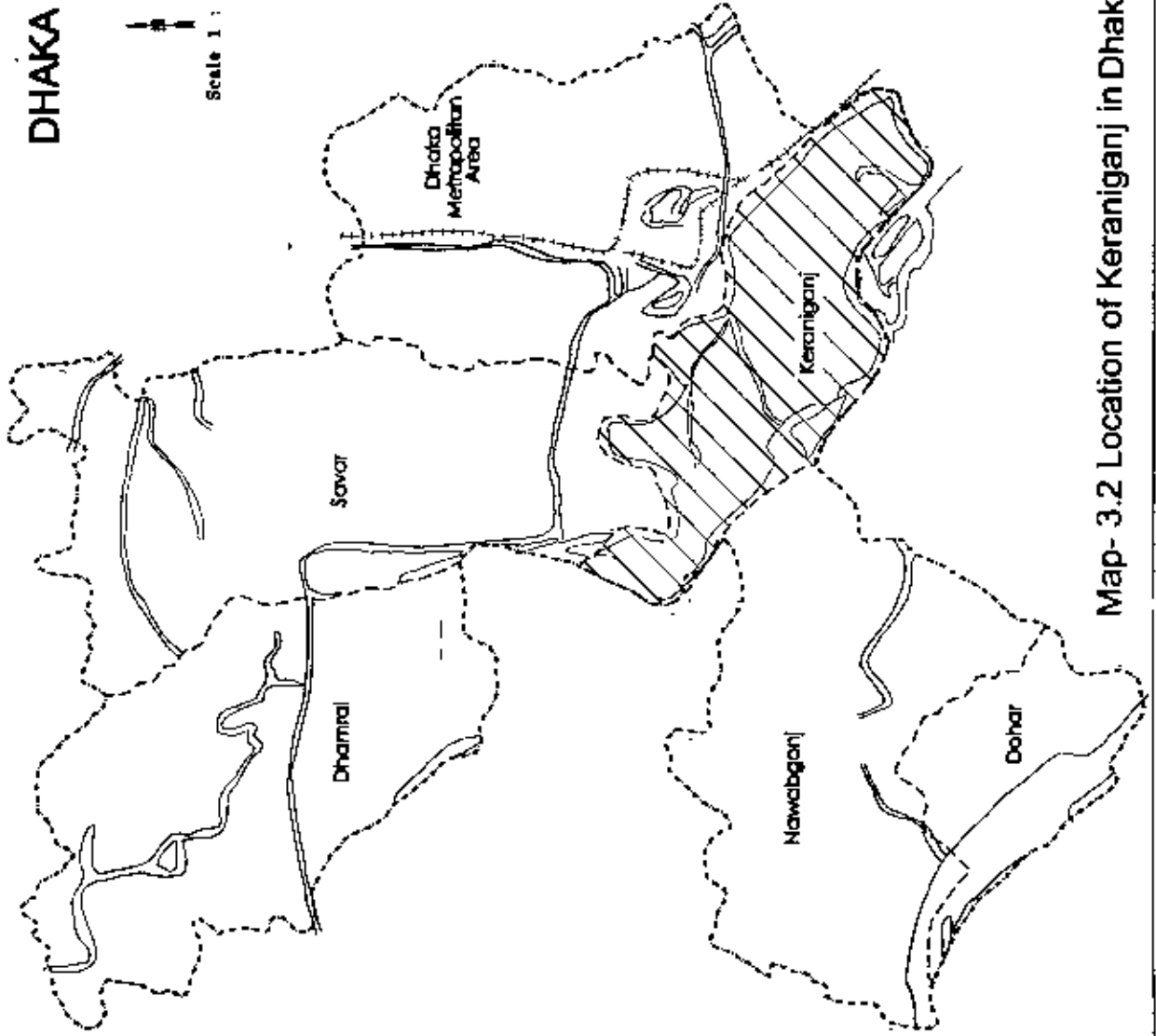
Source: Bangladesh Population Census, 1991, Upazila Series, BBS and Community Series: Dhaka, BBS 2004



Map 3.1 Location of Keraniganj in the Context of Surrounding Upazilas

DHAKA ZILA

Scale 1 : 350000



Map- 3.2 Location of Keraniganj in Dhaka Zila

BANGLADESH



Legend	
Zila Boundary	-----
Thana Boundary	-----
Project Boundary	▨▨▨▨
Metalled Road	====
Railway Line	+++++
River	~~~~~

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47, Ichchabak Commerciale Area
Dhaka - 1212

Map-3.3 shows mouza wise administrative division and **Map-3.4** shows population density of Keraniganj

3.5 Ownership of Agricultural Land:

In Keraniganj Upazila, 35.46% of the dwelling households own agricultural land and 64.54% do not own it (BBS, 2004)

3.6 Main Source of Household Income:

In the Upazila, 11.31% of the dwelling households depend on agriculture as the main source of income with 6.90% on cropping, livestock, forestry and fishery and 4.41% as agricultural labor. Other sources of household income are non-agricultural labour 3.73%, weaving 0.59%, industry 3.03%, business 28.25%, employment 16.94%, construction 3.66%, religious service 0.19%, hawker 0.89%, rent and remittance 4.65%, transportation and communication 7.37% and others 19.38%.

3.7 Site Analysis of the Study Area:

3.7.1 Physiographic Study: In the physiographic divisions of Bangladesh, Keraniganj falls in the Young Brahmaputra floodplain. The area slopes regionally towards the south with gentle and low relief. Levees are found in the elevated parts of the area. The study area is composed of alluvial terraces and low lying areas. (Khan, 1991)

3.7.2 Rivers and Canals: Two principal rivers, the Dhaleswari and Buriganga, with their numerous interconnecting small channels have formed the drainage system of the study area. The Buriganga is notable distributary of the Dhaleswari and flows a zig-zag course for about 26 miles before joining the larger stream (Sumi, 2004) around Dhaka. In addition, three *khal*s were found there: *Kaliganj khal*, *Zinjira khal* and *Buriganga Mirerbagh khal*.

3.7.3 Topographic Survey: According to the Geological Survey of Bangladesh, most of the land of Keraniganj is 5 to 10 feet high from the mean sea level. Some of the areas of Gadarbagh, Chunkutia, Konakhola and Zinjira *mouzas* fall in 15 to 20 feet high (Khan, 1991). The area slopes regionally towards the south with gentle and low relief. Soil forming process is still continuing in the area.

3.8 Transportation: Keraniganj Upazila is well connected with the Dhaka Metropolitan area through a transportation network provided by boats and roads. Though the road transportation linkage with Dhaka City was backward, after 1989 it has been improved due to the construction of 1st Buriganga Bridge near Postogola and construction of the 2nd

Buriganga Bridge on 2001 near the Mitford Hospital. A ferry *Ghat* is also located near the 2nd Buriganga Bridge

3.9 Basic Information on Experimental and Reference Area

The study has considered Zinjira *mouza* as experimental area and Atasur *mouzas* as reference area. There are four *mouzas* in Zinjira union where Zinjira itself is one of them. C. S Plot No. of the area is 580 (J.L. No. 429 in Map 3.3). It is surrounded by homestead in all sides and Buriganga at north side. Again, the reference area Atasur is one of the six *mouzas* of Kalindi union. Its C.S Plot No. is 190 (J.L. No. 422 in Map 3.3). It is surrounded by agricultural land in east, west and south sides and *khal* at north side (DDC, 2000). Again, the northern end of the bridge is located at Badamtoli *ghat* of Babubazar area. As the area is located within the buffer zone of the bridge, survey and following analysis have been done within the stakeholders of this area. In administrative jurisdiction, the area falls under ward no. 66 (part), Kotwali Thana of Old Dhaka. Total household and population of Babubazar area is 87 and 266 respectively (BBS, 2004). Following are more information about the experimental and reference areas:

Table-3.2: Area, Household, Population and Literacy Rate

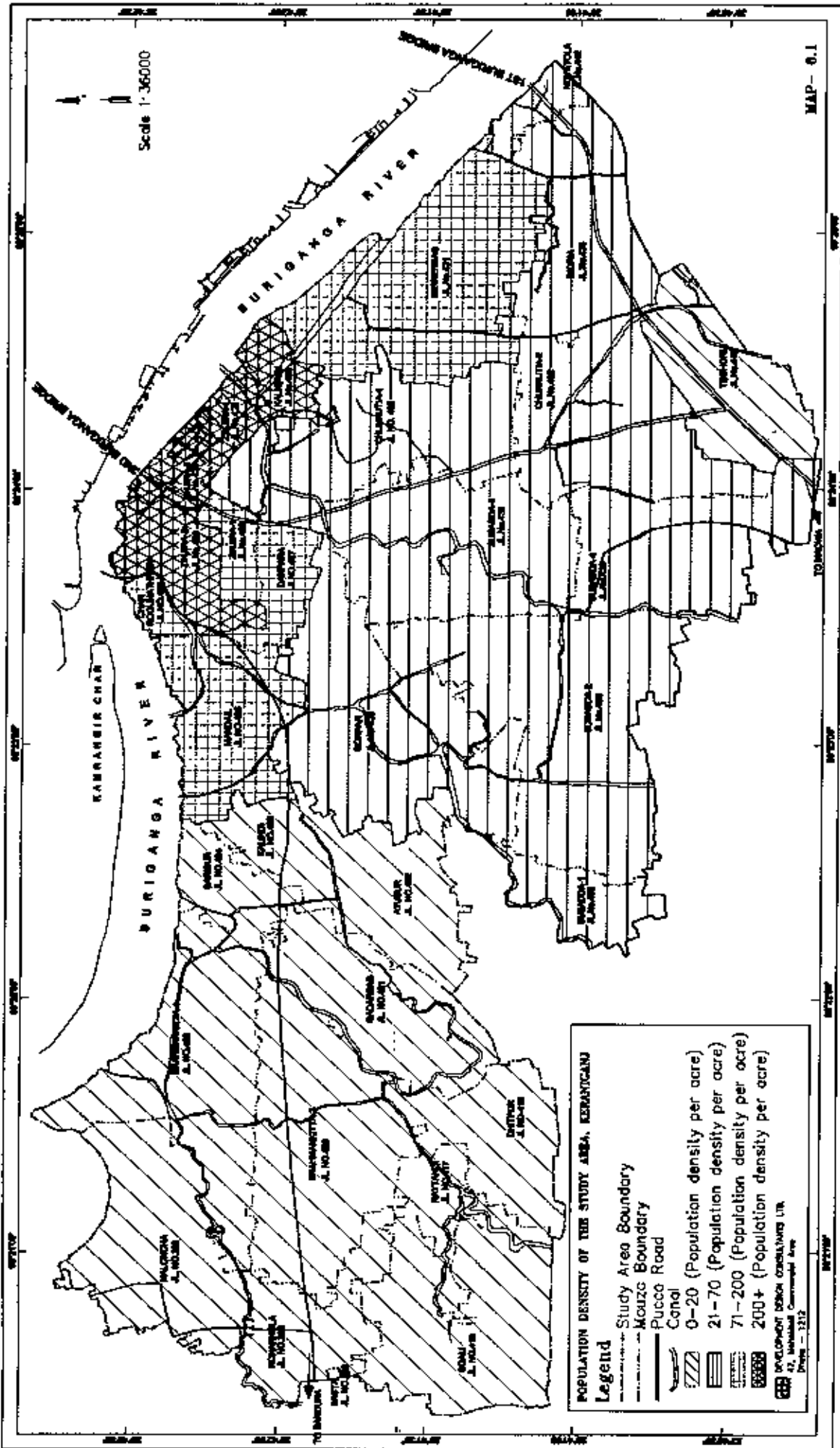
Mouza Name	Area in Acres	Households	Population			Literacy Rate (7+ years)
			Total	Male	Female	
Zinjira	230	331	1793	1082	711	39.83
Atasur	179	96	522	273	249	50.91

Source: BBS, 2004

Table-3.3: Household in Dwelling Unit by Source of Drinking Water, Toilet Facility

Mouza Name	Households	Sources of Drinking Water					Toilet Facility			Electricity Connection
		Tap	Tube Well	Well	Pond	Other	Sanitary	Other	None	
Zinjira	331	3	320	2	0	6	218	111	2	301
Atasur	96	0	96	0	0	0	35	61	0	82

Source: B.B.S, 2004



Map- 3.4 Population Density of Keraniganj in 2001

Table-3.4: Household in Dwelling Unit by Main Source of Income

Source of Income	Mouza Name	
	Zinjira	Atasur
Agri./Forestry/Livestock	2	4
Fishery	0	0
Agriculture Labor	0	8
Non Agri. Labor	2	15
Handloom	0	0
Industry	1	0
Business	107	25
Hawker	2	0
Transport	8	11
Construction	3	20
Religious	1	0
Service	47	10
Rent	2	0
Remittance	2	0
Other Main Income	154	3
Total Households	331	96

Source: B.B.S, 2004

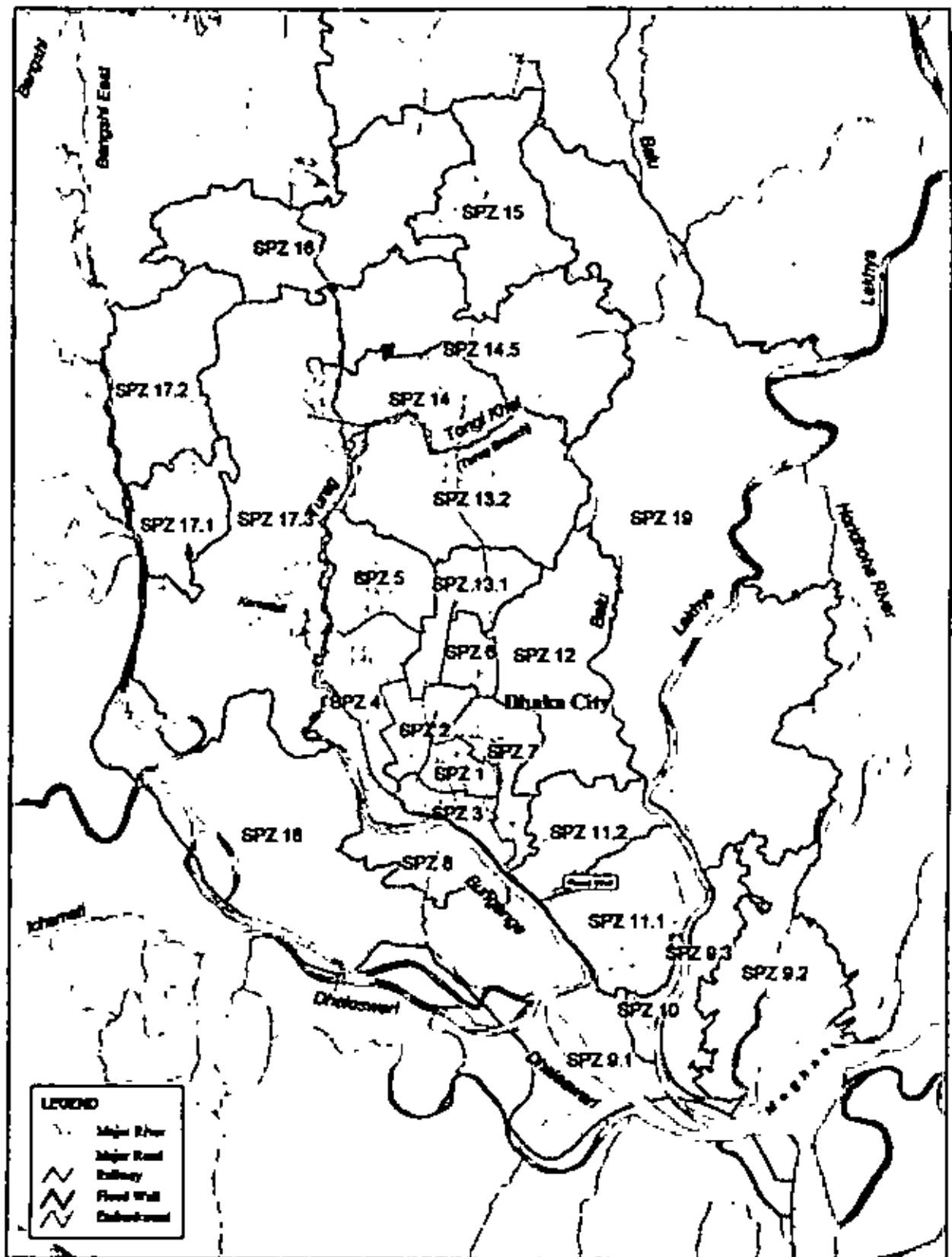
However, besides these census data source, some more information have been collected from the local authority of Keraniganj which have been described in the analysis part.

3.10 Existing Policies and Plan regarding Keraniganj Upazila:

3.10.1 Dhaka Metropolitan Development Plan: The DMDP is a set of three hierarchical plans: Structure Plan, Urban Area Plan and Detailed Area Plan. The Urban Area Plan provides a mid term strategy to the year 2025 for the development of the existing urban area and those areas likely to come under urbanization pressure over the next decade. The study area Keraniganj falls under Strategic Planning Zone 8 of UAP. **Map-3.5** shows Special Planning Zones under Urban Area Plan. Following are the details of Keraniganj described in UAP:

Major issues of Keraniganj identified in UAP:

- Development in the flood flow zone, given the direct flood hazards and the indirect impact on the river currents, should be discouraged. However the size of the existing population may force some government action. The second Buriganga Bridge, which



Map- 3.5 SPZs Under Urban Area Plan

is under construction, is an example. It will provide much needed access to the city for Zinjira, but it will also boost development

- The area is urban in character, but mostly developed in an unplanned manner. Houses are mostly single story with maximum plot coverage.
- Though the area has achieved an urban identity, it has not yet been made a municipality; as such it suffers from the lack of a local administration
- Its proximity with old Dhaka and easy access by boat and now by the second bridge, has made it attractive to low income people and small investors. As demand on such a small piece of land is high, it becomes very difficult to secure space for utility provision
- The area is **low lying and flood prone** and development requires substantial landfill. Roads are generally narrow, insufficient and unsuitable for vehicular movement. Moreover, some of the outlying areas of greater Dhaka are connected by road through Zinjira which further complicates the circulation system.
- The area encompasses substantial commercial and manufacturing activities which complement the Old Dhaka market and result in a high demand for land. The new bridge provides direct connection with the old city further boosts its economy and promotes development.
- Supply of many essential infrastructure and utility services is poor and contribute to the misery of people

Actions Recommended:

- The area urgently needs flood protection, basic infrastructure and access for its large number of inhabitants. The protected and development prone area should however, remain as reduced as possible. A detailed plan working out the minimal protection option of the FAP-8A study, coupled with an assessment of the access and utilities requirements is urgently needed.
- Given its strong orientation to Dhaka and its already large population, the area should be given municipal status or be included in the Dhaka City Corporation, since municipal administration is presently lacking.
- A development plan needs to be worked out with the local community to determine how the government may contribute/participate in the communal development in what way the whole community may promote and accommodate new developments. These could be residential, commercial or institutional; without hampering the upgrading process of the zone, nor polluting or endangering the environment (e.g. noxious/polluting activities).
- Immediate steps to manage and steer development through the mechanism of a Detailed Area Plans is required

- FAP-8A designed areas should either be reduced, or the plan to protect the area from flooding be abandoned, in order to maintain an unhindered flow of flood water. Large forms of development should be discouraged.
- Vertical expansion and the setting up of noxious industries should be prohibited to protect the environment of old Dhaka as the dominant wind flow is south is north.

3.10.2 Detailed Area Plan, 2008 (Draft): The Dhaka Metropolitan Planning project was closed down in 1995 without preparing the Detailed Area Plan component. RAJUK initiated a project in 2008 to accomplish the unfinished task of DMDP through preparation of Detailed Area Plan for the entire RAJUK area. To conduct this, the entire RAJUK area was divided into five groups where Keraniganj falls under Group-D. Though four areas were awarded to four different firms for preparation of the detailed area plan but no decision could be reached about Group-D area. (RAJUK, 2008) And therefore, it was divided among the four firms which created obstacle for integrated planning of the area. Though after reviewing the drafts DAP, it was found that, it has emphasized the following issues for future development of Keraniganj: about 60% of the area has been marked as agricultural lands that are subject to flooding during monsoon marked as a flood zone. The area serves as the hinterland of core Dhaka. So, the DAP proposes keeping existing characteristics as recommended by the Structure Plan. Restrictions will also be applied for the drainage channels and water bodies against any non-agricultural uses. Apart from residential, small scale industrial, commercial and mixed use developments will be allowed in existing settlement/areas marked as semi flood flow zone. Opening of the area through the proposed primary and access roads will encourage further new investors into the area. Particularly the land speculators and real estate developers will rush to the area allured by its low land price. It would be extremely difficult for RAJUK to control any development contrary to the DAP proposal with its existing strength and resources.

3.10.3 Flood Action Plan (FAP): Following the serious floods of 1987 and 1988, a National Flood Action Plan (FAP) was formulated under DMDP. The Greater Dhaka Protection Project (FAP-8A), formulated a framework for comprehensive flood control and storm water drainage in the Dhaka Metropolitan Area, covering an area of 850 Sq Km. The area consists of the Greater Dhaka and parts of Tongi, Savar, Keraniganj and Narayanganj districts. Proposed facilities for Keraniganj under FAP-8A are listed below:

Table-3.5: Proposed facilities proposed under FAP to Protect Keraniganj Area

Area	Flood Mitigation		Stormwater Drainage	
	Keraniganj	a) Embankment	23.3 Km	a) Pump Station (No.)
	b) Flood Wall	3.7 Km	b) Khal Improvement	22.5 km
	c) Sluice Gate	10 plcs	c) Retarding Pond	292.0 ha
	d) Land Acquisition	163.7 ha	d) Land Acquisition	50.6 ha
	e) Evacuation Facilities	1 L S		

Source: JICA, 1991

Phased Implementation Program:

Phase I: 1991-1999: No Implementation Program for Keraniganj

Phase II: 2000-2004: Flood Mitigation Facility

Phase III: 2005-2010, 2005-2009: Storm water Drainage Facility and Evacuation Facility

Review of Existing Measures: In order to protect the Greater Dhaka from flooding, the Greater Dhaka Flood Control Committee was established immediately after the 1988 flood. The Committee's proposal included flood mitigation facilities for the nearby towns of Savar, Tongi and Narayanganj. However **no flood mitigation plan for Keraniganj was prepared.** The Committee's plan was scheduled into two phases, i.e. Phase I and Phase II. Most of the proposed works for the Phase-I were commenced immediately after their approval. The flood protection plans proposed for Phase II have no implementation program yet, except for the two pump stations in Dhaka City. For the other urban areas, i.e. Tongi, Savar, Narayanganj and **Keraniganj, no major flood prevention facility exists yet** (JICA, 1991).

3.10.4 Buriganga River Bank Protection and Development Project:

The project was initiated by BWDB as an outcome of a unified social campaign entitled as '*Save the Buriganga*' duly participated by different social elites, activists, NGOs etc. Meanwhile Bangladesh Environmental Lawyers Association (BELA) proceeded for legal initiative in order to evict undue possessions around the river. Also the issue was duly emphasized in the national policy frame.

The project includes part of Keraniganj thana, from 1st Buriganga Bridge to Kholamora area. The main objective of the project is to enhance overall environmental consideration of the adjoining area. The long term target of the project is to accelerate convenient river transportation as well as to provide availability of the sweet potable surface water in adjacent area keeping optimum conveyance capacity of the river. The project was scheduled to be commenced in 2000-2001 and proposed to be completed in 2003-2004. The project works necessitated for the acquisition of lands of 20.07 ha. from Mandail

Mosque to 1st Bunganga Bridge. Estimated cost for the project was 7014.61 Lakh Taka (BWDB, 2002)

Present Status of Project: BWDB had already undertaken the construction works of 2.20 km flood wall in the left bank of the Buriganga River from Lalbagh Kellermour to Midford Hospital under ongoing programme of Greater Dhaka Integrated Flood Protection Project (FAP-8B). All the illegal establishments in the said area were evicted. The ongoing programme also included R.C.C. block protection works at the river side, feeder road construction works from Satmosjid to Mitford Hospital and construction of pucca ghat (Jetty) for convenient transportation of passengers as well as tradable commodities. The protection work from 1st bridge to Kholamora has been completed which were scheduled to conduct within phase-1 but road construction is yet to be completed. Though it was scheduled to be completed within 2001 to 2004, but it was finally completed in 2006. Major **obstacles** were: All of the illegal establishments alongside the shore line of BIWTA could not be removed, protection work could not be done in many places removing big industries and dockyards and lack of adequate fund. The 2nd phase has scheduled protection work from Kholamora to Dhaleswari Mouth. Proposal for this development work has been submitted to ECNEC but it is still under processing. **BIWTA Shore Line Protection Act 1960** was developed to protect the river flow but it could not be enacted properly. Because they have defined the shore line but did not change the government land record accordingly. So, the previous owners claimed the river bank which is also proved by their records (BIWTA, 2008).

3.10.5 Rehabilitating the Buriganga-Turag-Shitalakhya River System & Augmentation of Dry Season Flow in the Buriganga River:

Dhaka Metropolitan City, covering about 380 Sq. km. is the concerned area for the study. The area is bounded by the Buriganga-Dhaleswari on the south, Turag on the west, Tongi Khal on the north and Balu-Lakhya on the east. A part of the Keraniganj located on the south of the Buriganga and Kamrangir Char is also included in the study area. To rejuvenate the Buriganga-Turag-Balu-Lakhya river systems, the project was scheduled by the BWDB with the following objectives:

1. To rehabilitate river system around the Dhaka Metropolitan area and provide round the year flow through augmentation from the Jamuna River.
2. To protect the Bunganga-Turag and Shitalakhya river system from pollution and to ensure navigation through the rivers round the year for preservation of natural environment of the Dhaka City.
3. To explore possibility of Low Lift Pump (LLP) irrigation and fishery development.

The project has considered several issues for augmentation requirement. The Jamuna River is the main natural source of water for augmentation in the Buriganga. Major offtakes on the left bank of the Jamuna have been considered to identify possible routes for augmentation. Accordingly, major four offtakes of the Jamuna i.e. Old Brahmaputra, Dhaleswari North, New Dhaleswari spill channel and Dhaleswari South have been considered and four routes have been identified as options. The comparison reveals that, option-3 (New Dhaleswari offtake-Pungli-Bangshi Turag-Buriganga: length 180 k.m.) will be the preferred option in comparison to other options. Economic analysis revealed that the economic benefit cost ratio and EIRR of the project are 1.9 and 23% respectively, which indicates the project to be highly attractive (BWDB, 2004). Appendix 4 shows proposed flow through augmentation. A possible negative impact lies with the project. After the construction of Jamuna Bridge, the spill channel is shifting since last years. Proposal on 'Buriganga Augmentation project will also be implemented on this same spill channel. Huge investment and structural requirement have been included in the project proposal. If shifting trend of Jamuna bridge spill channel increases, all these investments and structures will be useless. This point should be considered by the relevant implementing agencies.

Present Status of the Project: The project has been designed to be implemented from 2005-06 FY to 2010-11 FY. Accordingly it has been submitted to External Resource Division (ERD) of Planning Commission of Government. 610 crore taka has been asked for the project which might be sourced from internal and external source. No significant feedback is yet found from ERD to implement this project.

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Chapter 4: The Second Buriganga Bridge

4.1 History of Development

The 2nd Buriganga Bridge is the main way of road transportation between Dhaka and Keraniganj Upazila. Northern end of the bridge is located adjacent to Badamtoli *Ghat*, Babubazar, of Old Dhaka and the southern end is at Aganagar union of Keraniganj Upazila. The Bridge was opened for all on 20 May, 2001. Construction period was from June, 1994 to June, 2000. It was constructed by a private consulting firm **The Engineers Ltd.**, under the supervision of Roads and Highways Department (RHD), Ministry of Communication of Bangladesh Government. The firm prepared a feasibility report prior to the construction work on November, 1985 in association with the Development Design Consultants Limited.

4.2 Project Background and Economic Analysis (as Feasibility Report)

The requirement of a bridge at the proposed site on the Buriganga was felt long ago. Dhaka city developed first after the partition of the sub-continent of in 1947, and even faster after liberation. The development of the Keraniganj area on the right bank, in spite of its great potential, is protracted, due to a lack in public sector development efforts and natural factors including annual flooding. Unplanned development of the area is however going on. The proposed bridge has facilitated urban industrial development of Keraniganj Upazila, and also opened up vast areas of the south-west and south by providing un-interrupted road transport link with the capital city. Considering the gap between Dhaka and Keraniganj, a feasibility study was conducted under RHD supervision for the construction of the Bridge. The study showed that, construction of the bridge would be economically viable and it would not create any adverse impact on the physical and environmental status of the study area. Rather, it would ensure better accessibility between two parts of Dhaka which would have a long term positive impact. Therefore, it suggested implementing the 'Bridge' as soon as resource available.

4.3 Location and Significance of the Bridge

On Bengal partition in 1905, Dhaka became the capital of Bengal-Assam Province of British India, which was subsequently annulled in 1911. Then Dhaka became the Capital City of Bangladesh. On the left bank of the Buriganga river, Dhaka city is virtually the nerve centre of the national road and other modal transport network. Unfortunately, the other side of the river is a vast under-developed agricultural region and is annually

flooded. Although situated so close to the capital city, no planned industrial-urban development took place therein. The Bangladesh China Bridge over the Bunganga is located near Postogola at downstream position. This provides a direct and shortest link for the Zinjira area with the capital city. Keraniganj has the potential for suburban development since it has access to electricity, gas and telephone. The bridge over Buriganga at Babubazar is expected to accelerate urban-industrial development of Keraniganj area and facilitate removal of the growing congestion of Dhaka city by the low income group. The Bridge links up the Dhaka Mawa road to open up the vast areas of the interior. **Map-4.1** shows location of 2nd Buriganga Bridge as drafted by the Engineers Ltd.

4.4 Major Features of Bridge: The Bridge is located just on Babu Bazaar *Ghat* near Badamtoli. Length of the main bridge is 304 m and total width is 14.00 m. It is built with pre stressed concrete simply and the girder is simply supported by Y-pier. Here, approach road length is total 573 m and total spans are 6 nos., 44 each.

4.5 Transport Modes

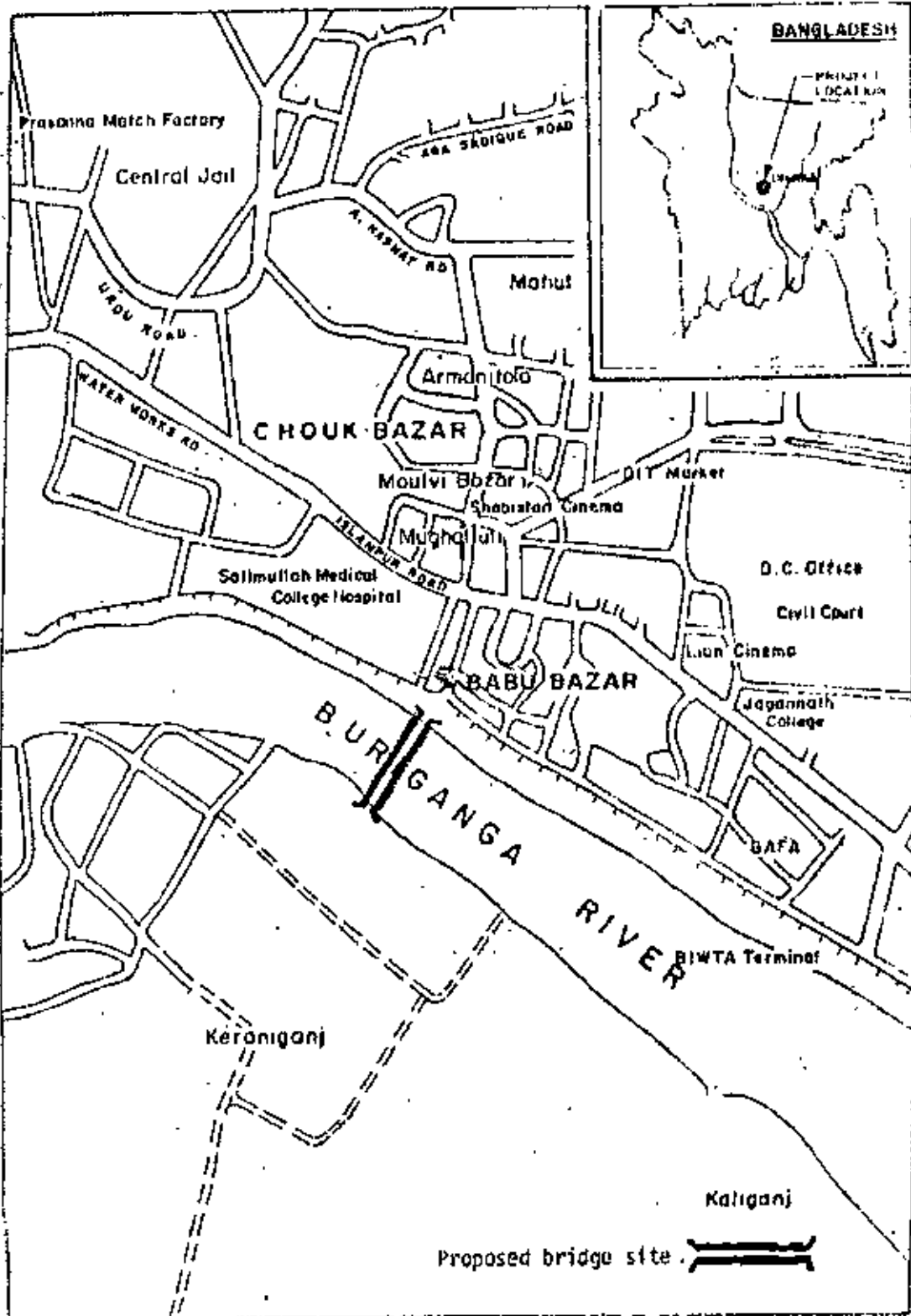
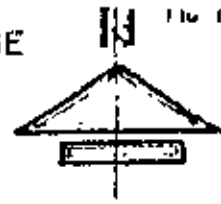
The transport link of Keraniganj with the Metropolitan city was provided mostly by manually operated numerous small country crafts connecting the right and left bank *ghats*. No road other than few strips where plying of two rickshaws side by side is difficult exists in and around Zinjira area. The only road leads to the south-west opposite Sayeedpur on the Dhaleswari bank, and extends with a gap of about a mile up to Dohar on the Ganges-Padma bank. Buses ply up to the bank along brick soled narrow strip. Zinjira is planned to be connected by a new road with the Dhaka-Mawa road off the other end of the proposed Bangladesh-China Friendship Bridge. Without flood control and drainage, and planned urbanization including land development, all around including road development in and around the area will be protected.

4.6 Sources of Traffic

The 2nd Buriganga Bridge attracts a considerable flow of traffic to pass over it on its construction and opening to traffic. Potential traffic for the proposed bridge will primarily consist of the following components:

- a) **Normal Traffic:** Traffic flow goes across the river daily from bank to bank is normal traffic. The bank-to-bank traffic is now compelled to avail the service of water transport (country boats) in absence of the bridge.
- b) **Diverted Traffic:** diverted traffic for the proposed bridge will arise mainly from the following two sources. Firstly: Traffic in movement by water transport

PROPOSED SECOND BURIGANGA BRIDGE
PROJECT LOCATION MAP
DHAKA CITY (PART)



Map- 4.1 Location of the 2nd Burigonga Bridge.

between Dhaka city and various points of origins/destinations in the zone of influence of the proposed bridge; Secondly: Traffic in movement by road between Dhaka city and various points of origins/destinations in the zone of influence of the proposed bridge.

- c) **Generated Traffic:** Experience suggests that, the bridge will result in substantial generation of traffic for various reasons i.e. On its construction, the bridge will enable expansion of the metropolis towards the southern part which has so far been under-developed due to the river barrier.

Traffic survey and following observation showed that, estimated passenger and freight traffic going across the river by country boats from bank to bank were about 1,69,000 persons and 1,03,000 maunds respectively as in mid 1985. Field survey in 2007 shows that, presently about 20% more traffic is using the bridge which has been occurred due to increased trade and commercialization of Keraniganj and in other areas of influence of the bridge.

4.7 Toll Collection

The Bridge is a source of revenue income for the government through collection of toll Table-3.1 shows present rate of 'Toll' of the bridge.

Table-4.1: Rate of Toll in the 2nd Buriganga Bridge

Sl No.	Vehicle Type	Amount (Tk)
1.	Truck	132
2.	Bus	84
3.	Mimbus	47
4.	Microbus	38
5.	Private Car	20
6.	Motor Cycle	5
7.	C.N.G Auto rickshaw	12
8.	Rickshaw/Van (with good/passenger)	5
9.	Rickshaw/Van (empty)	3
10.	Bicycle	3

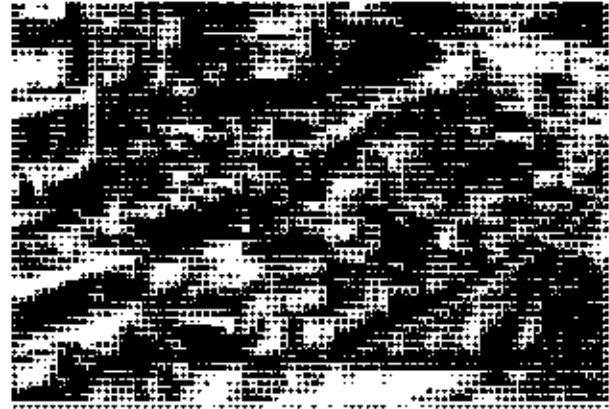
Source: Questionnaire Survey with Toll collector, 19 April, 2008

4.8 Present Status of the Bridge

The Bridge has two link roads, i.e. one is connected with Dhaka-Mawa Highway and another is through Chunkutia intersection towards Munshiganj. Now, it is acting as a communicator between the southern part of the country and Dhaka. Most of the traffic of Keraniganj and surrounding areas (which were using the waterway) has shifted to roadway through this bridge. Within nine years, the bridge has taken the main role for socio-economic development of the area. Field survey reveals that, the bridge is causing traffic congestion in Babubazar and surrounding areas.



*Phot-4.1: The 2nd Buriganga Bridge
(Photo: 26 May, 2008)*



*Photo-4.2: Heavy traffic congestion on the bridge
congestion (Photo:23 February,2008)*



Photo-4.3: A single light set by the toll collector is not enough to reduce the darkness over the bridge as of Hijacking; accidents were increasing due to this. (Source: The Daily Prothom Alo, 29October, 2008)

Unauthorized parking of buses and CNG auto rickshaws on the bridge is reducing the width of the road for free movement of vehicles. It accelerates traffic congestion. Again, link road of the bridge is in a deteriorated condition. The link roads are not completed fully as per the original plan with exact width. Physical condition of the bridge is not. The bridge is being used by heavy traffic. So it needs regular and proper maintenance. Two girders of the link road of the bridge are partially broken by goods carrying vehicle which needs reconstruction. Again, street lights over the bridge are not maintained properly.

In many points these are missing. Toll collection process and free movement of vehicle are hampered specially at night due to these problems. Again, Concrete barrier and iron fencing were built surrounding the main pillars of the bridge to ensure better safety of the structure. But this fencing has been damaged by collision with big water vessels like cargo, trawler and launch. This has caused the main piers of the bridge unprotected and at the same time, water vessels are moving with risk when these passes under the bridge. This problem becomes acute during monsoon when water level is high and at night when the broken fences are not visible properly.



Photo-4.4: Some holes in the link roads of 2nd Buriganga Bridge are causing accident of traffic and pedestrians of user (Source: The Daily Prothom Alo, 13 July, 2006)



Photo-4.5: Pillar protection fence of 2nd Buriganga Bridge has been damaged by heavy water vehicles which has increased risk of accident (Source: The Daily Prothom Alo, 21 June, 2008)

Chapter 5: Analysis

This chapter focuses on the major findings on the physical and socio-economic changes of Keraniganj area which has occurred after the construction of the bridge. It has done based on the observation of the field survey in the study area and discussion with relevant people. It has also included the environmental issues of the study area and the changing scenario after the opening of the bridge.

5.1 Impact of the Bridge on Physical Condition of Keraniganj

5.1.1 Road way Transportation:

The opening of 2nd Buriganga Bridge has developed the road communication with Keraniganj area which was started from the opening of 1st Bridge at Postogola. Easy and quick communication with greater Dhaka had a resulting effect on the accelerated development in trade, commercialization and industrialization of the area. Better communication with rest of the country led a better road network within the Upazila boundary. In last eight years, after the opening of the bridge, construction of new roads is as follows: 50 km *pucca* road, 70 Km *semi-pucca* and 50 km *kutchha* roads. Most of these roads are connected to Buriganga Bridge approach roads and also the national highways. As low lying areas and khals are pre dominant in the area, there were new bridges and culverts to maintain smooth road communication. New constructions in last eight years in this regard are: 8 bridges of 480 meter length, 22 footbridges, 30 culverts, 6 sluice gates. (Source: Upazila Parishad Office, Keraniganj)

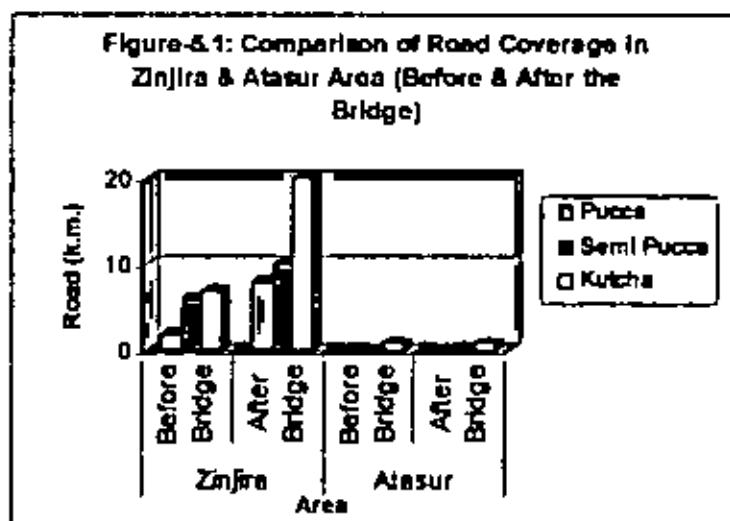
Table-5.1: Existing Road Coverage in the Study Area

Area	Before Bridge (1995-96)			After Bridge (2007-08)		
	<i>Pucca</i>	<i>Semi-pucca</i>	<i>Kutchha</i>	<i>Pucca</i>	<i>Semi-Pucca</i>	<i>Kutchha</i>
Zinjira <i>Mouza</i>	2 km	6 km	7 km	8 km	10 km	16 km
Atasur <i>Mouza</i>	-	-	0.92 km	-	0.5	0.92 km
Keraniganj Upazila	57 km	65 km	416 km	210 km	115 km	520 km

Source: Keraniganj Upazila Parishad Office

But no road construction occurred in Atasur *mouza* during this time. A *kutcha* road was developed in this *mouza* to communicate with Kalindi Union 15/20 years back which is the only road here. In monsoon period, traditional boats are the only way of communication for the inhabitants to move within their village and also to the Keraniganj sadar. Status of road coverage of Keraniganj has been described in Table-5.1

This infrastructure development activity has ensured income generation for local people of Keraniganj. In FY 2005-06, 761 metric ton rice was allocated in 286 road projects of Test Relief (TR) program for construction of roads. Again, altogether, 10,241,000 taka was spent under 'Work for Money' program of Infrastructure development works in Keraniganj Upazila. These amounts were increased in FY 2006-07 also (Engineering Section, Keraniganj Upazila Parishad).



Source: Keraniganj Upazila Parishad Office

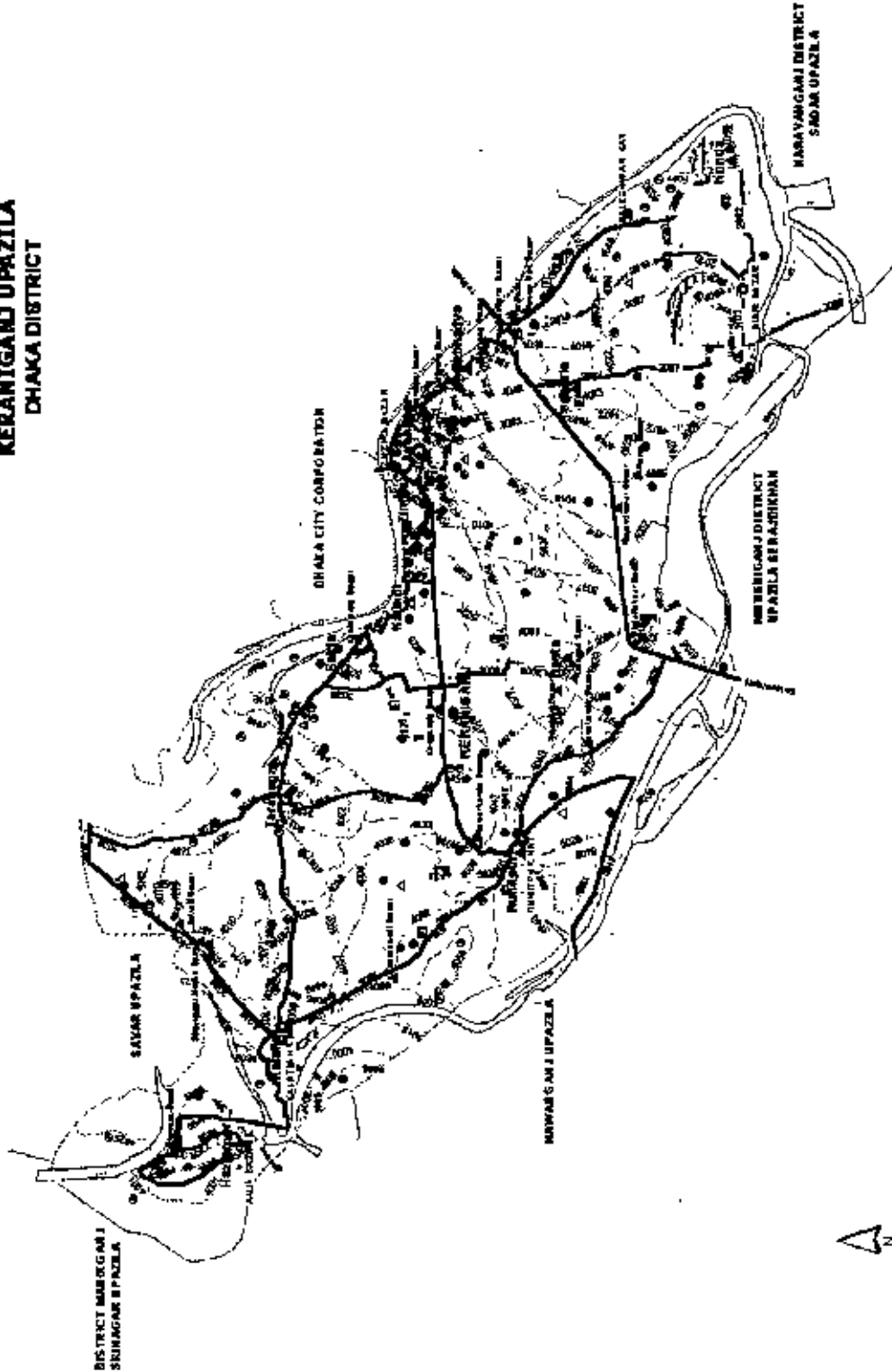
After the construction of bridge, two approach roads have been created along side it:

- (i) Bandura Sank which is connected with Nawabganj Regional Highway (towards Munshiganj)
- (ii) Zinjira Bridge Road connected with Dhaka Mawa National Highway.

Map-5.1 shows Road Map of Keraniganj Upazila where two approach roads and other roads have been identified.

Dhaka-Mawa highway passes through the western part of the study area; crossing Subhadda, Teghroia and Basta unions. Another *pucca* road is from Zinjira ferry *ghat* to Upazila Parishad in Konakhola *mouza*. Road width varies from 2 to 4 meters only. Among the 12 unions of the Upazila, Keraniganj Sadar has *pucca* or semi *pucca* roadway

**ROAD MAP
KERANIGANJ UPAZILA
CHAKA DISTRICT**



LEGEND	
—	Administrative Boundary
—	National Boundary
—	District Boundary
—	Upazila Boundary
—	Union Boundary
—	Water Boundary
—	Administrative IDN
●	Upazila HQ
●	Union HQ
—	Physical Infrastructure
—	National Highway
—	Regional Highway
—	All Road
—	Upazila Road/Track
—	Union Road/Track
—	Village Road/Track
—	Village Road/A Track
—	Village Road/B Track
—	Village Road/C Mobile
—	Power Can (Government)
—	Railway (Broad Gauge)
—	Railway (Narrow Gauge)
—	National Road/Track
—	Water River
—	Water Canal
—	Other
●	Scale
●	Barometer
●	Green Landmark
●	Forest/High Forest
●	Police Station
●	Upazila Health Center/Police
●	Roadside Water Center
●	Post Office
●	College
●	High School
●	Primary School
●	Market
●	Region
●	Community Clinic
●	Subpost-Office

Map-5.1 Road Map of Keraniganj Upazila



DISTRICT MAMURGANJ
SUNAMGAR UPAZILA

SAVAR UPAZILA

DHAKA CITY CORPORATION

MAMURGANJ UPAZILA

MAMURGANJ DISTRICT
UPAZILA BERAZHMAN

KARAYANGANJ DISTRICT
SADAR UPAZILA

connection in all over the years with Ruhitpur, Kalindi, Aganagar, Zinjira, Sakta, Taranagar and Kalatia unions. But the other five unions have to connect with the Sadar Upazila through *pucca* road communication

Other than public bus service provider BRTC, many private bus companies have established their counter in Keraniganj. The bridge has opened 3-way communication with Keraniganj. Now any part of the country can be visited from Keraniganj which was a dream of five years back. From several points of Dhaka city including Gulistan, Gabtoli, Mirpur, New Market bus communication to Keraniganj exists. Presently within 15 minutes, anyone can reach Dhaka city from Keraniganj previously which was a matter of 1/1.5 hours matter. Again, 8-10 hours were required to reach Dhaka from Dohar-Nawabganj by river which has been reduced to 2-3 hours through the bridge. During questionnaire survey, it was viewed that, for some respondents, the distance between workplace and residence was only 2 km and he had to spend 30-45 minutes by boat, river which has reduced to only 10 minutes through *beribandh*.

The bridge has facilitated communication in stormy weather when boat services were stop for an uncertain period. Lost of lives from drawn of boats was a regular phenomenon in rainy season and in stormy weather. Previously working people had to face this problem severely when they had to go back home after day long work in Dhaka and surrounding areas.

5.1.2 River way Transportation:

In Keraniganj area, Buriganga River provides the inland water transportation route mainly for the country boats and mechanized boats. Before the year 2001, river transportation was the main way of communication for the area. But after the opening of 2nd Bridge, road transportation has become the main way of communication for the inhabitants. Still there are 15-20 river *Ghats* on both sides of the Buriganga which are mainly used for transportation of vegetables, rice|bags, garment products and people. The prominent *Ghats* on the Keraniganj side are, Syedpur Ferry *Ghat*, Kholamura *Ghat*, Aganagar *Ghat*, Zinjira *Ghat*, Ruhitpur *Ghat*. In north side of Buriganga, the major *Ghats* are Sadar *Ghat*, Wise *Ghat*, Mashjid *Ghat*, Badamtoli *Ghat* and BIWTA launch terminal. But 75% of their load has shifted to bridge. For example, previously Babubazar *ghat* was one of the important river *ghats* of old Dhaka but now its only function is to load and unload rice bags in a limited scale. Again, Badamtoli river *ghat* was the centre of river way transportation to Dhaka city. 400-500 river boats were engaged to carry goods here before bridge which has been reduced to 30-40 boats. Again, previously this route was closed during stormy weather but now improved roadway communication has reduced this risk. Presently major use of this river way is to carry vegetable and other goods from

Keraniganj and southern parts of the country to Dhaka city. Another cause for reducing dependency on the river way is encroachment and filling of canals. Important canals like Zinjira-Syedpur canals, Shuvadda canal, Buriganga Mirerbagh canals were playing a major role for connecting Southern part of the country to greater Dhaka. Encroachment, construction of illegal settlements and dumping of waste has filled up most of the canals. But these canals were playing a very significant role for the internal communication of Keraniganj and due to their absence most of these uses have been shifted to roadway.

5.1.3 Chronological Change in Land Use Pattern:

After the construction of 2nd Buriganga Bridge, demand for both vacant land and price of land, both have been increased repeatedly. So, the vacant lands are being filled up to use it as residential/commercial use. Land filling work is not being done without considering structure plan and environmental reservation. In the same way, agricultural lands are being turned to non-agricultural use rapidly. In many cases ownership of land is also changed. Table 5.2 and Table 5.3 are showing existing land type and landuse of Keraniganj area.

Table-5.2 Land Type of Keraniganj Upazila in 2007

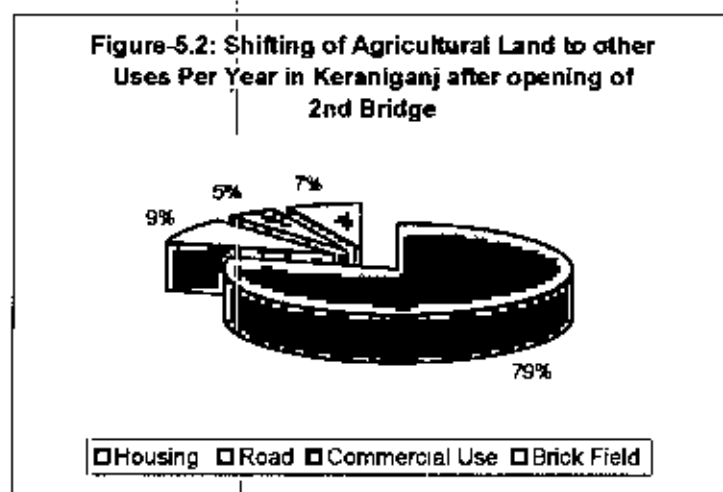
Type of Land	Quantity (Hectare)
High Land	2642
Medium High Land	4311
Medium Low Land	6470
Low Land	2924
High Low Land	210
Ponds and Ditches	140
Total Land	16697

Table-5.3 Land Use Category of Keraniganj Upazila in 2007

Type of Land	Quantity (Hectare)
Total Productive Land	9785
Forest	07
Marshy Land	140
Barren Land	-
Temporary Vacant Land	3500
Permanent Vacant Land	50

Source: Agricultural Section, Keraniganj Upazila Parishad

Low income/poor inhabitants are shifting to inward places after selling their lands to developers. But this scenario is different in Zinjira area which is the main commercial area of Keraniganj. Low income people who have land/houses in this area, they are renting them to tenant/business people as economic activities are increasing day by day. This trend is also causing shift from agricultural use to mixed/commercial uses. This trend is so acute that, presently there is no agricultural land in Zinjira area. Figure-5.2 shows shifting trend of land use in Keraniganj Upazila



Source Agricultural Section, Keraniganj Upazila Parishad, 2008

Again, there is a significant change in the land use pattern all over the Upazila specially the areas adjacent to bridge. For example, the area of Zinjira union is 244 hectares where in 2000 there were 512.35 acres of agricultural land; in 2006 it became zero acres. Again, in 2004, total agricultural land of Kalindi union was 741 acres which has reduced to 494 acres. So, on an average, per year 247 acres of lands are being shifted from agricultural to other uses. (Agricultural Section, Keraniganj Upazila Parishad). Table-5.4 shows comparison of land use pattern of Keraniganj Upazila and Map-5.2 shows land use pattern of Keraniganj Upazila.

Table-5.4: Comparison of Land use Pattern of Keraniganj Upazila

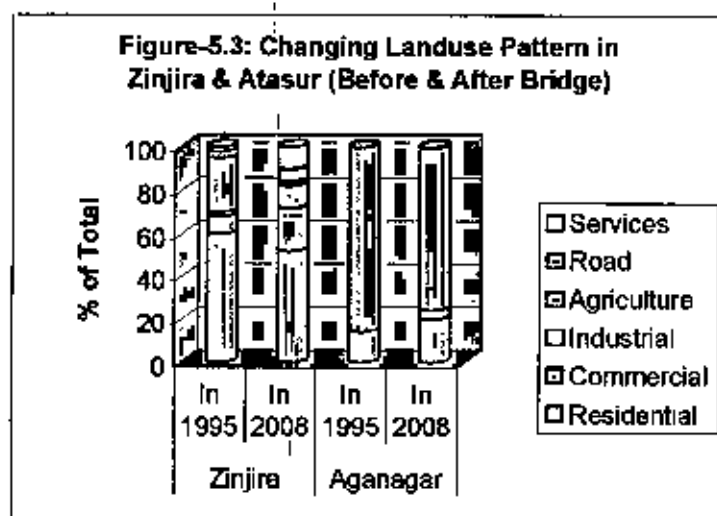
Categories of Use	In 2000		In 2008	
	Areas in Acres	% of total	Areas in Acres	% of total
Residential	1194.94	20.72	1566.72	27.20
Commercial	47.13	0.82	347.83	6.04
Industrial	46.09	0.8	152.64	2.65
Educational Facilities	4.37	0.08	132.48	2.30
Health Facilities	6.31	0.11	69	1.20
Administrative	11.48	0.2	63.36	1.10
Urban Services	3.88	0.07	57.62	1.00
Socio-cultural	17.2	0.3	34	0.59
Recreational(In door)	2.12	0.04	3.46	0.06
Pucca Road	43.57	0.76	118.03	2.05
Semi-pucca Road	55.68	0.97	161.28	2.80
Kutchra Road	25.14	0.44	299.52	5.20

Water Bodies	322.75	5.6	126.5	2.20
Agriculture	3979.34	69.09	2627.56	45.62
Total	5760	100	5760	100

Source: DDC Survey, 2000 and Keraniganj Upazila Parishad, 2008

Changing Land use Pattern in Experimental and Reference Area:

But such impact of land use is not so prominent in the areas far from bridge. For example, Agricultural land is prominent in *Atasur Mouza*. The area of *Atasur* is 4 acres where 80% was agricultural in 2000. The scenario is almost unchanged even in 2008. Land filling has been started there just now. Agricultural land is shifting to residential use in a little pace, but no trend of commercial or industrial development is visible there. There is no mixed land use pattern in *Atasur*. Before the construction of the 2nd Buriganga Bridge, in 2000, main occupation of *Atasur* was agriculture, service and small business based on agriculture. As there is no commercial or industrial development in this area in last 5-6 years, so occupation pattern is almost unchanged. There is no positive change in the living standard and urban facilities after the construction of the bridge. Figure-5.3 presents information on the changing of land use pattern of *Zinjira* and *Atasur Mouza*.



Source: DDC Field Survey, 2000 & Keraniganj Upazila Parishad, 2008

Table 5.6 shows that, there is no change in road and related infrastructure development of *Atasur* before and after construction of bridge. Low lands are being filled up and agricultural lands are just now shifted to convert residential uses. There is no other use in *Atasur* so far. And most of the utility facilities and services are absent there.



Photo-5.6: Haphazard growth in Zinjira

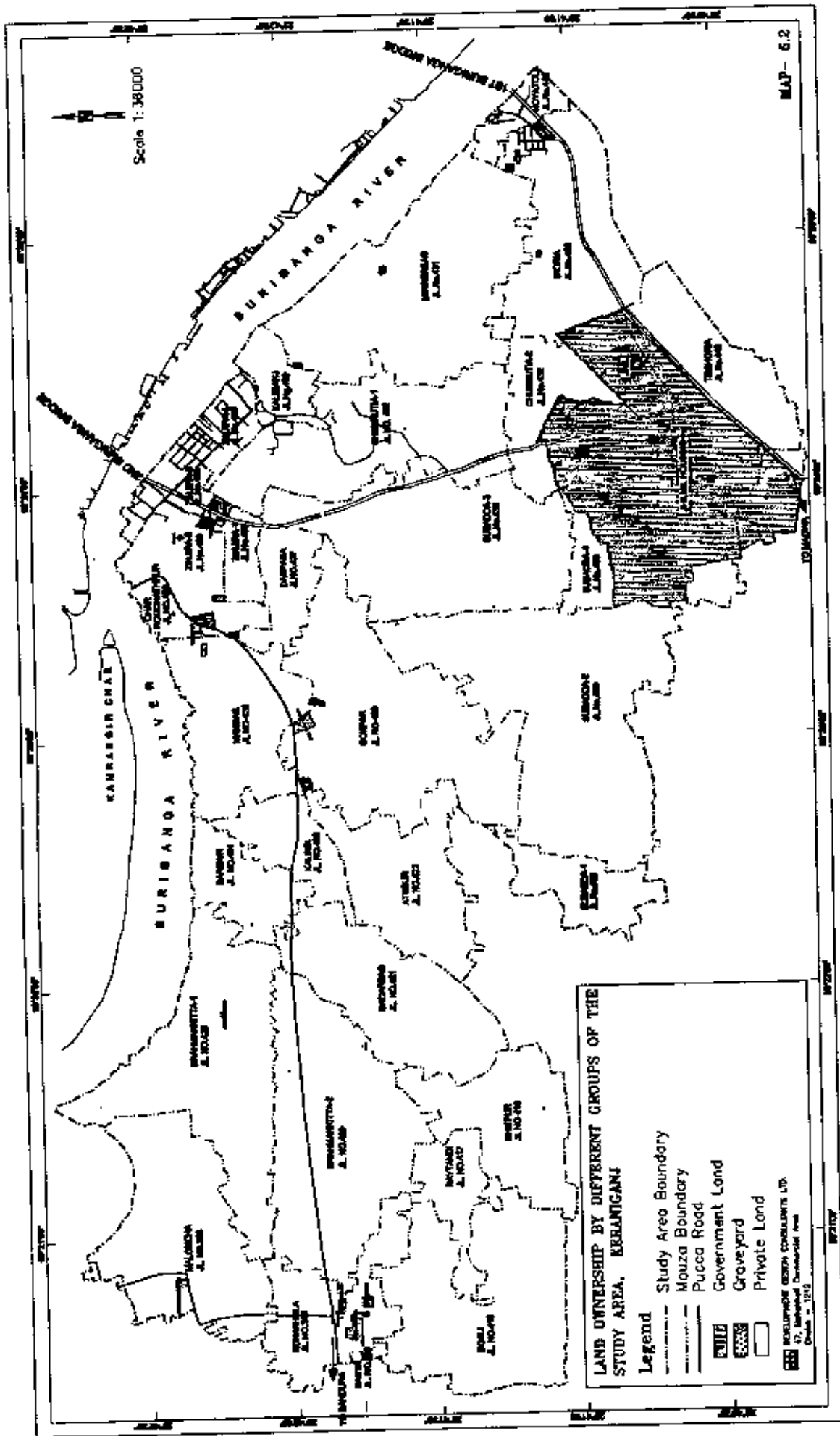


Photo-5.7 Vast agricultural and low lands in Atasur

During field survey it was seen that Zinjira is already a dense populated area. The area is growing in a haphazard manner without considering legal or administrative requirements. There is no agricultural land or significant greenery in Zinjira whereas vast agricultural and low land is the predominant phenomenon in Atasur. Pace of urbanization is not same everywhere of Keraniganj Upazila rather access to bridge and improved communication pattern are the major factors here. As Atasur is far from the bridge, change of land use pattern and haphazard urbanization is slower in the area. Whereas, increased land value and rapid commercialization have changed the Zinjira totally within 5-6 years after the bridge construction. **Map-5.2** shows land use pattern of Keraniganj in the year 2000

5.1.4 Change of Land Ownership Pattern:

The majority of the people of Keraniganj live in their own houses inherently. Among the surveyed households, 60 percent live in their own houses inherently while 25% have their own land as they purchased. Those who have their own land among the rest live either on *khash* land or in rented houses. About 0.4% of the households live in government quarters and 13% and 4% of the family live respectively in rented house and on *khash* land. This scenario is commonly viewed in most part of the Upazila. **Map-5.3** shows land ownership pattern of Keraniganj in 2000. Recent trend of increased commercialization has changed the land ownership pattern of Zinjira area. But the scenario is quite different in areas like Atasur. Here 94 percent people lives in their own houses. The reason behind this difference between Zinjira and Atasur is that new developments and changes are happening alongside the major thoroughfares and adjacent to the bridge. Development trend has not reached the more remote areas yet. Though there is significant change in land ownership pattern in Aganagar and Zinjira areas, it has not happened in Atasur. About 20% old residents of Aganagar and Zinjira areas have shifted further away after



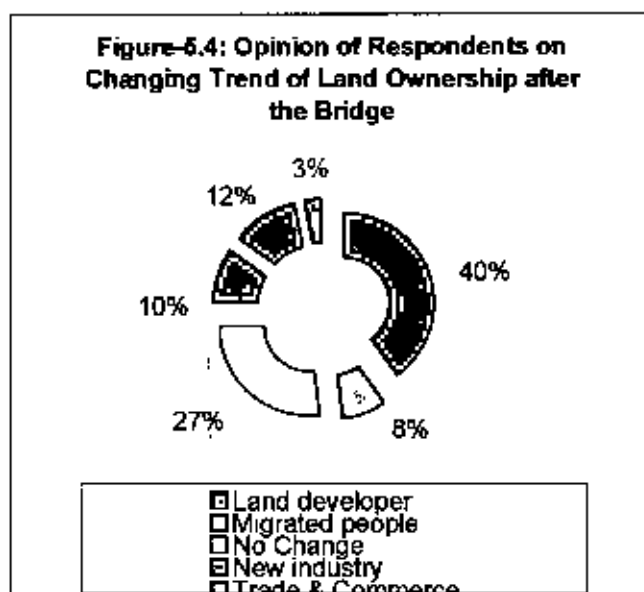
selling their land at high price to migrants from Dhaka or to land developers. Table 5.7 shows land ownership pattern of Zinjira and Atasur *Mouzas*.

Table-5.5: Land Ownership pattern of Zinjira and Atasur areas

Type	Zinjira		Atasur	
	(% of resident)		(% of resident)	
	In 2000	In 2007	In 2000	In 2008
Inherited/Paternal	67.1	45.75	97.15	94
Purchased	19.65	35.25	2.85	3.12
Rented	13	18.75	0	2.88
Govt quarter	0.25	0.25	0	0
Total	100	100	100	100

Source: DDC Field Survey, 2000 & Keraniganj Upazila Parishad, 2008

The table shows that, there is a significant trend is found in Zinjira area which is just adjacent to the bridge. Here inherited lands are being shifted to the new hands coming to this area. Increased scope of commercialization is demanding prominent locations for establishing business centers and trade house. Again, in Atasur area, no such significant change was found.



Source: Questionnaire survey, 2008

Figure-5.4 shows the opinion of respondents regarding changing trend of land ownership pattern after the construction of Bridge. Majority of the respondents thinks that, **land developers are purchasing land in high price** which is alluring the low and middle income group for getting big amount of money in a single chance. Another part of the

respondents did not agree with this trend. They are building new construction on their land and renting to business centers or to new inhabitants coming to this area. Majority of people fall under high income group of Zinjira area. Again, feedback from most of the respondents of Atasur was in the same line. As there is no significant development after the bridge, so demand was not created for shifting agricultural land or residential uses to other uses. Most of the land owners are old in age and they got it from predecessors.

5.1.5 Existing Settlement and Household Pattern:

Rapid urbanization and increased income opportunities have changed living standards of the people of Zinjira area. The 2nd Buriganga Bridge has initiated significant impact on its adjacent areas. Zinjira is the prominent example of this. But areas far from bridge like Atasur are lagging behind from this change. This issue has created a basic difference between the building structure and household pattern of Zinjira and Atasur areas. In Zinjira, new buildings, multistoried residences and market places along with modern household pattern of people are the most visible changes. On the other hand, *kutcha* or semi *pucca* buildings, traditional household pattern, lack of commercial and industrial activities remind that, the area was less effected by development in the last years after the construction of the bridge. Zinjira *mouza* has the highest amount of land under *pucca* settlement. Most of these *pucca* settlements are performing dual role like residential cum commercial (Resicom). Besides, the new housing projects, there is a staff quarter of Dhaka Mitford Hospital occupying 0.19 acres. About 27.64 acre slum areas remain in five densely populated *mouzas* including Zinjira. On the other hand, in Atasur area, most of the residents are local. Few new developments are seen there which are also residential. There is no slum or mixed use of land and settlement pattern. Figure-4.2 shows changing trend in use of building in Keraniganj area since last years. In 1995, the area was completely dominated by residential uses. Some other uses like commercial and industrial came following this. In following years, specially after 2001, mixed uses of buildings became significant. This scenario was visibility found specially in Zinjira after the construction of the bridge. Presently Zinjira and Aganagar *mouzas* have the highest amount of land under *pucca* settlement. Most of these *pucca* settlements are performing dual role like residential cum commercial (Resicom). Besides, the new housing projects, there is a staff quarter of Dhaka Mitford Hospital occupying 0.19 acres. About 27.64 acre slum areas remain in five densely populated *mouzas* including Aganagar and Zinjira.



Photo-5.8: New buildings and modern household pattern in Zinjira



Photo-5.9: Traditional accommodation and household pattern in Atasur

On the other hand, in Atasur area, most of the residents are local. Few new developments are seen there which are also residential. There is no slum or mixed use of land and settlement pattern. Figure-4.2 shows changing trend in use of building in Keraniganj area since last years. In 1995, the area was completely dominated by residential uses. Some other uses like commercial and industrial came following this. In following years, specially after 2001, mixed uses of buildings became significant. This scenario was visibility found specially in Zinjira area.

Figure-5.8: Changing Trend in Use of Buildings, Zinjira

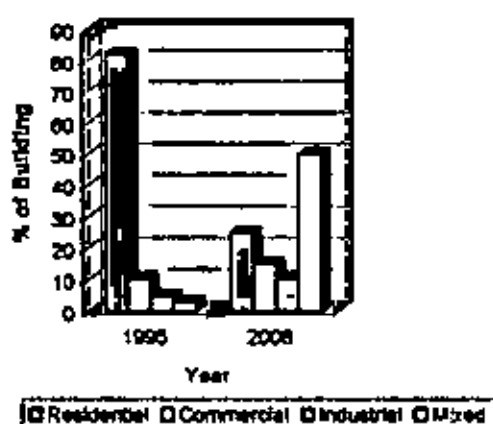
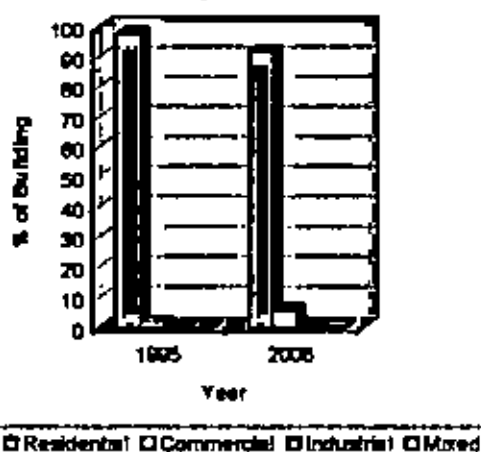


Figure-5.8: Chaning Trend in Use of Buildings, Atasur



Source: Questionnaire Survey, 2008

These areas are adjacent to the bridge. New spate of commercialization first touched here. Then landlords started to rent their part of their houses or buildings to business centers after some modification. This seems much more profitable to them than using it as a pure residential use. Significant trend is also found for developing commercial and industrial structures to meet the demand of time. In the same time, the reference area Atasur still carries the traditional pattern in accommodation pattern and use of buildings.

5.1.6 Changing Pattern of Land Value:

Land value in the study area has been classified into four categories according to their price and use. Land value was collected from the sub-register office of Keraniganj Upazila. But during the questionnaire survey, a difference was found between the actual land value and government records. This is because of the government procedure. To maintain an easy way for collecting revenue through land deeds, the government has prescribed that, minimum land value will be treated as the standard land value of all mouzas of any area.

According to the survey, highest land value was found in the Kaliganj, Aganagar, Zinjira and Mirerbagh *mouzas* where over crowded mixed uses exist and the land is suitable for residential, commercial and industrial purposes. Characteristics of this type of land are flood free and located on roadside. As the *mouzas* are well linked with road or waterways, the value becomes high. Map-5.4 shows land value of the study area in 2000.

While, the lowest land value was found in those *mouzas* which are far from communication linkages and the areas which have no proximity with the developed areas. For example, the reference area, Atasur which is not so well connected, generally fall into minimum value category. Low lands also exist in those areas which are not buildable or requires huge land filling for reclamation. Usually the agricultural land and ditches that go under water during monsoon fall in this group.

During questionnaire survey, Hazi Alimullah, a businessman in Keraniganj told that, the bridge has changed Keraniganj. Before the opening of the bridge, even in 2000, the land value was 1-2 lakh per *bigha* (30 decimal) but it has reached 16-18 lakh taka. Previously, that land which was valued at 70-80 thousand taka has been reached 10-12 lakh taka per *bigha* (30 decimal) within 6-7 years. In his opinion, there is no poor person in Keraniganj, people who had even a small piece of land in Keraniganj has become solvent through proper utilization of this land.

Residential Land: DDC Survey in 2000 in Keraniganj revealed that the highest value of residential land was in Zinjira *mouza* (Tk 94,194 per decimal) and lowest was in

Rayatandi *mouza* of Basta Union (Tk 2,717 per decimal). Generally, residential land value is high in Suvadda and Zinjira unions among all the unions in the Upazila. This is because both the unions are near the Dhaka Metropolitan Area and are easily accessible by road and water. The lands are also flood free and located near the core areas where commercial activities dominate.

Table-5.6 Mouza wise Land Value in the Study Area (Residential)

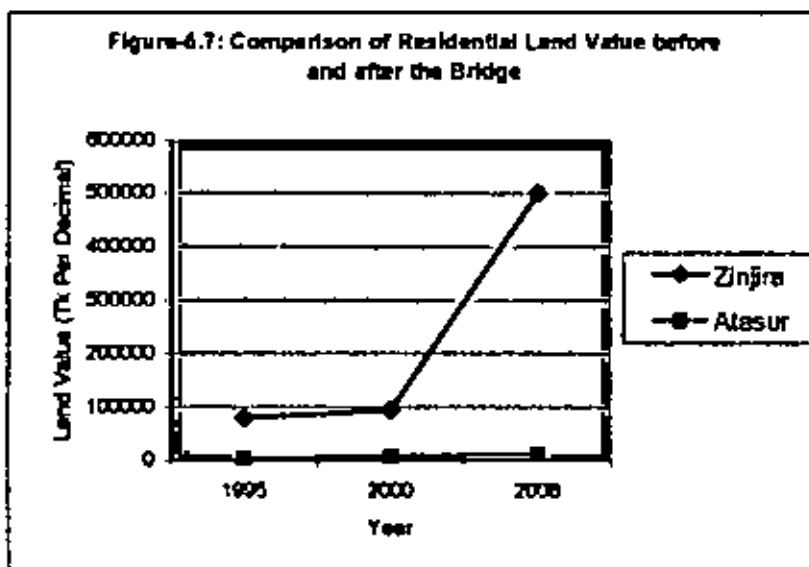
J. L. No.	Name of Union/Mouza	Minimum Land Value (Tk./Decimal)	
		In 2000	In 2008
Suvadda Union			
430	Kaliganj	74,425	5,00000-6,00000
431	Mirerbag	77,666	3,00000-4,00000
432	Chunkutiya	48,841	3,00000-4,00000
433	Suvadda	28,571	1,50000-2,00000
441	Ikuria (Part)	73,443	1,00000-1,50000
442	Naiatola	27,380	75,000
Zinjira Union			
425	Mandail	62,567	3,00000-4,00000
427	Dakpara	49,696	2,00000-2,50000
428	Char Ragonathpur	70,171	3,00000-4,00000
429	Zinjira (Experimental Area)	94,197	4,00000-5,00000
Kalindi Union			
420	Brahmankita	13,958	50,000-1,00000
421	Gadarbagh	8,307	15,000
422	Atasur (Reference Area)	8,842	12,000
423	Kalindi	38,536	50,000
424	Barisur	48,459	70,000
425	Gokpur	45,333	80,000-90,000
Sakta Union			
398	Malancha	14,552	18,400
Basta Union			
416	Dhitpur (Part)	4,000	6,000
417	Rayatandi	2,717	5,500
418	Boali (Part)	11,931	15,000
419	Konakhola	21,025	30,000

Source: Sub-registry Office, Keraniganj, N.B: 30decimal=1 *bigha* & 3 *bigha*=1 acre

Again, after the construction of the 2nd Buriganga Bridge, road communication has

become faster and smoother. This has increased the land value specially in the adjacent areas like Aganagar and Zinjira. In many cases residential land or buildings have turned to commercial use as it brings increased income opportunity.

Table 5.6, table 5.7 and table 5.8 show different categories of land values in Keraniganj. It should be mentioned that land value can vary even within same category considering location and accessibility of other facilities. Table-5.6 shows residential land value of Keraniganj in compare to changing context for the construction of bridge. The residential land which lie in less connected areas has drastically lower value is drastically lower than the land located near the core areas. *Mouzas* in the Kalindi, Sakta, Basta and Teghuria unions are in the same group, though some areas of the *mouzas* are moderately high in comparison with the highest value of land. On the other hand, increased accessibility after the 2nd Buriganga Bridge construction has accelerated increased trend of residential land value in the unions adjacent to bridge. *Mouzas* in Suvadda, Kalindi union fall under this category. Land values were comparatively higher in these areas and increased accessibility with greater Dhaka has drawn the attention of land developer and high income groups to fuel further residential development there. This trend has increased land value there. Figure-5.7 shows comparison of residential land value in the study area before and after the bridge.



Source: Questionnaire Survey, 2008

In Zinjira area, residential land value was 94,197 Tk per decimal which is increased to nearly 5, 00000 Tk in 2008. On the other hand, in Atasur area, per decimal land price was 8,842 Tk which has increased to 12,000 Tk. Increase of land price in Atasur was only

because of the change of time, whether it Zinjira, it is largely forced by the increased demand of land after the construction of 2nd Buriganga Bridge.

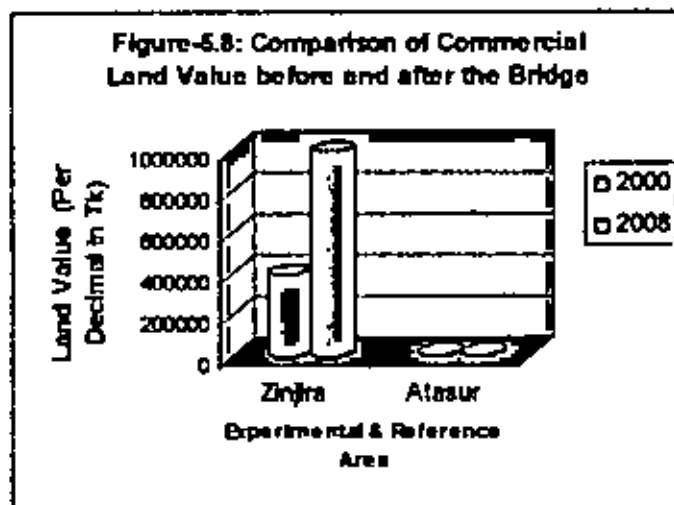
Commercial Land: Commercial use is concentrated in Kaliganj, Mirerbagh, Zinjira, Aganagar and Kalindi *mouzas*. Because these areas were comparatively better communicated than any other parts of the Upazila from very first and these have improved more after the construction of the bridge.

Table-5.7: Mouza wise Land Value in the Study Area (Commercial)

J. L. No.	Name of Union/Mouza	Minimum Land Value (Per Decimal in Tk.)	
		In 2000	In 2008
Suvadda Union			
430	Kaliganj	5,00000	10,00000-12,00000
431	Mirerbag	2,00000-3,00000	10,00000-11,00000
432	Chankutiya	60,000	3,00000
433	Suvadda	20,000-1,00000	1,00000-3,00000
441	Ikuria (Part)	1,20,000	3,00000-4,00000
442	Naiatola	1,00000	4,00000-5,00000
Zinjira Union			
425	Mandail	25,000	6,00000
427	Dakpara	3,00000	10,00000
428	Char Ragunathpur	2,50,000	6,00000
429	Zinjira (Experimental Area)	4,00000	10,00000
Kalindi Union			
420	Brahmankita	1,00000	3,00000
421	Gadarbagh	6,000	10,000
422	Atasur (Reference Area)	12,000	15,000
423	Kalindi	4,00000	7,00000
424	Barisur	50,000	1,00000
425	Gokpur	40,000	75,000
Sakta Union			
398	Malancha	15,000	30,000
Basta Union			
416	Dhitpur (Part)	6,000	10,000
417	Rayatandi	6,000	9,000
418	Boali (Part)	6,000	11,000
419	Konakhola	50,000	3,00,000

Source: Sub-registry Office, Keraniganj, N.B: 30decimal=1 *bigha* & 3 *bigha*=1 acre

Two highways are connected through these areas. So, for development of trade and commerce, there are highest prioritized areas. Among this type of land, highest land value was found in Kaliganj and Mirerbagh *mouzas*. Before the construction of the 2nd bridge, land value was 2-5 Lakh Tk per decimal and now it has increased up to 10-12 lakh Tk per decimal. All the areas adjacent to Dhaka-Mawa highway which are flood free, this trend of increased land value is a common scenario. For this reason, new business, shopping centres are being concentrated alongside this road. Again, conversion trend of residential or agricultural land to commercial use is highest here. Table-5.7 shows commercial land value of the study area. But the scenario is different for the areas far from this commercial arena. For example, in Atasur, Saktia and Basta *mouzas*, there is no significant trend for lands for commercial development. So, land price has increased there only with the natural trend of time, no significant effect is found there for commercial or industrial development which cause increased land value.



Source: Sub-registry Office, Keraniganj

Figure-5.8 shows comparison of land price in experimental and reference area before and after the bridge. Zinjira area is one of the most prominent locations of Keraniganj. So, land price of these *mouzas* are much higher than many other parts of Keraniganj. Land price has increased keeping this consistency after the bridge also. In 2000, per decimal land value was 4,00,000 Tk in Zinjira. But in 2008, increasing about 150 percent, it has reached to 1,00,000 Tk per decimal. On the other hand, in 2000, commercial land value was 12,000 Tk per decimal in Atasur where it has reached to 15,000 Tk decimal in 2008 increasing only 25 percent.

Atasur is a remote area of Keraniganj and land price is comparatively lower here from early days. After the construction of the bridge, no significant change was visible there

which is also found in the changing scenario of land price in compare to other prominent locations

Agricultural and Low Land: In the study area, the yearly flood frequently submerges all agricultural land and low land. According to the use, low land is also considered as agriculture land.

Table- 5.8 : Mouza wise land value in the study area (agriculture and low land)

J.L. No.	Name of Union/Mouza	Minimum Land Value (Per Decimal in Tk.)	
		In 2000	In 2008
Suvadda Union			
430	Kaliganj	46,617	2,00000-3,00000
431	Mirerbag	21,101	90,000-1,00000
432	Chunkutiya	13,833	52,000
433	Suvadda	16,917	60,000
441	Ikuria (Part)	45,135	1,00000
442	Naiatola	12,652	30,000-35,000
Zinjira Union			
425	Mandail	32,222	70,000
427	Dakpara	33,138	65,000
428	Char Rangunathpur	40,000	55,000
429	Zinjira (Experimental Area)	41,068	2,00000-3,00000
Kalindi Union			
420	Brahmankita	2,814	10,500
421	Gadarbagh	4,904	12,200
422	Atasur (Reference Area)	4,373	8,000
423	Kalindi	3,661	7,050
424	Barisur	11,142	15,400
425	Gokpur	22,884	50,000
Sakta Union			
398	Malancha	6,391	12,000
Basta Union			
416	Dhitpur (Part)	3,361	6,000
417	Rayatandi	1,369	4,000
418	Boali (Part)	3,009	6,000
419	Konakhola	3,855	10,000

Source: Sub-registry Office, Keraniganj, N.B: 30 decimal=1 *bigha* & 3 *bigha*=1 acre

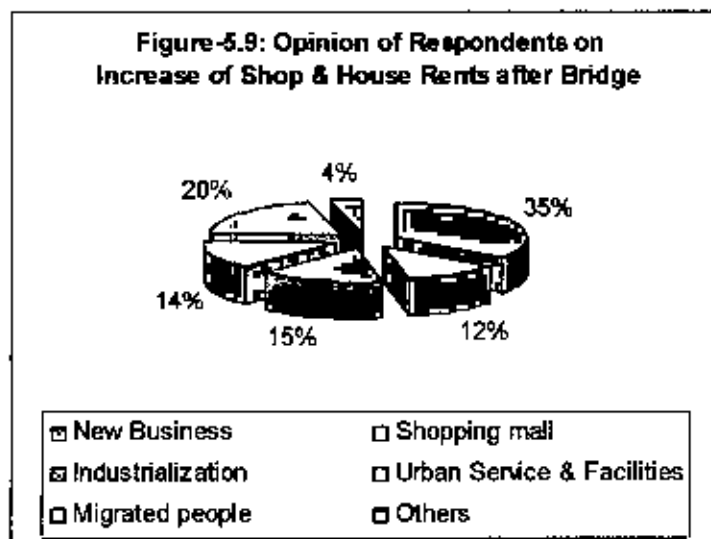
Most of the agriculture land is single cropped in the study area. **Agricultural land value is also high in the Zinjira and Kaliganj unions** because the lands are being filled for commercial or industrial purpose. Table-5.8 shows comparison of agricultural and low lands of the study area before and after the bridge. Minimum value of agricultural land was found in Kaliganja Mouza (Tk 46,617 per decimal) which was the highest among all the *mouzas* in the study area. This trend increased tremendously next to the time of seven-eight years when opening of the '2nd bridge has initiated trade and commercialization mostly in Kaliganj, Aganagar and Zinjira area. There is few very agricultural lands are available in these 3 *mouzas* as most of those have been shifted to other uses. Lowest land value of agricultural land was found in Rayatandi mouza (Tk 1,360 per decimal). Gradually land value is increased in Kalindi, Sakta and Basta unions which are located in comparatively odd communicated areas. Poor residents of Aganagar, Zinjira, Kaliganj and other proper areas are shifting to these parts after selling their lands at higher price to land developers. Some high income group who have started living in the housing societies of Aganagar and Zinjira areas, are also purchasing agricultural lands for expanding business in this line. This trend is also causing gradual increase of agricultural land value.

Industrial Land: Industrial development mainly occurred in the mouzas named Barisur, Mandail, Char Raghunathpur, Zinjira and Kaliganj. Most of the industries are located within one kilometer from the riverbank of Buriganga. Land value of those industrial areas was as same as residential land of those areas described by the Sub-registry office even in 2001. But improved communication pattern through Dhaka-Mawa highway and Dhaka-Nawabganaj highway has initiated industrialization. This recent development has increased the land value of areas adjacent to road and river bank. Some of the industries occupied low land of the riverbank. Small factories located sparsely in the study fall within the land value range of residential land.

Ponds: A large number of ponds are available in the study area but land value was not prescribed by the government for all the areas of Keraniganj Upazila because the ponds in the agriculture land did not hold water throughout the year. In dry season, these are used as agricultural or low land. The pond, which contains water throughout the year, considered in this category. Minimum rate fixed by government for these ponds was Tk 1200 per decimal in Atasur mouza and Tk 28,571 in Zinjira mouza in 2000. This value gradually increased with the increased demand of vacant land all over the Upzaila in last 5-6 years. Recent study shows that there is no significant change of land value of ponds in Atasur mouza but most of the ponds are being filled up in Zinjira and Aganagar areas. Land value is almost double of these ponds now.

5.1.7 Changing Pattern of Shop Rent & House Rent

The 2nd Buriganga Bridge has initiated rapid growth rate of shop rent varied depending on its possession. Accordingly, house rent increased considering to accessibility, building standard, utility and other facilities. So, it is difficult to define any general standard for shop rent and house rent like in the study area. During the questionnaire survey, it was found that, in Zinjira and Kaliganj bazaar, a 30 feet (by 10 feet) shop (without utility) was rented at Tk 500-600 per month in 2000, but after the bridge it has increased up to Tk 1200-Tk 1500. Again, different scenario was viewed for houses with utility. In Zinjira area, a one room semi *pucca* building used to be rented at Tk 500-600 five years ago which has risen to Tk 1000. Similarly, the rent of a one-room *pucca* building was Tk 1000 which has increased to Tk 1500 in 2007. Again, adjacent to bridge and near Zinjira bazaar, a one-room *pucca* building had a rent of (without utility) Tk 750-800 which has risen to Tk 1500. Again, with utility, a one-room full *pucca* house rent adjacent to bridge was Tk 1000-1500 which has increased to Tk 1800-2000. Possession of a shop was sold at Tk 4-5 Lakh before the bridge in 2000 in Zinjira and Kaliganj bazar, but opening of new trade and commerce has driven it up to Tk 20 lakh.



Source: Questionnaire Survey, 2008

Figure-5.9 shows opinion of respondents in Zinjira regarding increase of shop and house rents with the changing context after the bridge. New business and urban facilities are creating demand for shops and houses near commercial centers which is causing the shop and house rent to escalate. This has changed the socio economic condition of local residents and their accommodation pattern. Landowners have changed their economic status through proper utilization of lands. Again, residents have changed accommodation

pattern, i.e. semi-pucca buildings have turned to multistoried residential apartment blocks. Instead of pure residential use, mixed uses are becoming predominant in the areas adjacent to bridge and other better communicated areas.

On the other hand, the condition is different in areas far from the bridge and without improved road network. In *Atasur mouza*, there was no pucca or semi-pucca road in 5-6 years back and still it is in same condition. Gas and other pre-conditions for posh residential and commercial development are absent here even after the bridge in 2008. So no opportunity for business and commercial development raised here which caused augmentation of shop rent in Zinjira area. Most of the residents of Atasur are local and so there is no significant trend of house rent also.

5.1.8 Urban Services and Facilities

Existence of urban services represents that the concerned area is affluent and developed. But Keraniganj is not like that same despite being situated within close proximity to the city centre. It is because of various reasons, like the river Buriganga, location outside from the Dhaka Metropolitan Area, lack of attention of the development agency etc. and as there is no central urban service provider i.e. city corporation or Paurashava. In table-5.9, available urban services of the area are listed.

Table-5.9: Status of Urban Services and Facilities in Zinjira Area

Sl.	Services/Facilities	Before Bridge (in 1999)	After Bridge (in 2007)
1.	Road Network	Poor	Moderate
2.	Communication with Dhaka & other parts of the country	Launch	Bus
3.	Gas Supply	Available	Available, Low Pressure
4.	Public Water Supply	N/A	N/A
5.	Electricity	Available in smaller part of the area	Coverage expanded but Acute Load shedding
6.	Solid Waste Management	N/A	N/A
7.	Drainage System	N/A	Available only in Zinjira-Aganagar Market but condition is very poor
8.	Sanitation	N/A	Available
9.	Health Facilities	Available	Available, facilities increased
10.	Telephone	Available in limited	Coverage expanded,

		area, Analog system	digital system
11.	Postal System	Available	Available
12.	Launch <i>Ghat</i> /Ferry <i>Ghat</i>	Available	Available
13.	Open Space	Available	Available, most of the areas are already covered under development work
14.	Other Recreational Facilities	N/A	N/A

Source: Questionnaire Survey, 2008

In compare to Zinjira area, Atasur is much behind in the standard of urban services and facilities Table-5.10 shows the available urban services and facilities in Atasur area.

Table-5.10: Status of Urban Services and Facilities in Atasur Area

Sl.	Services/Facilities	Before Bridge (in 1999)	After Bridge (in 2007)
1.	Road Network	One <i>pucca</i> road was constructed 15-20 years back	Condition remain unchanged
2.	Communication with Dhaka & other parts of the country	Launch	Bus
3.	Gas Supply	N/A	N/A
4.	Public Water Supply	N/A	N/A
5.	Electricity	Limited Coverage under DESA	Expanded Coverage under Rural Electrification Board
6.	Solid Waste Management	N/A	N/A
7.	Drainage System	N/A	N/A
8.	Sanitation	N/A	N/A
9.	Health Facilities	N/A	Available
10.	Telephone	N/A	N/A
11.	Postal System	Available	Available
12.	Launch <i>Ghat</i> /Ferry <i>Ghat</i>	N/A	N/A
13.	Open Space	Available	Available
14.	Other Recreational Facilities	N/A	N/A

Source: Questionnaire Survey, 2008

The study reveals that, only seven *mouzas* of the whole upazila is involved with most of the urban services. The *mouzas* are Aganagar, Zinjira, Konakhola, Basta, Sakta, Suvadda, Kalindi union. Most of the services are absent in Atasur *mouza*. Among the services, launch/boat *ghat* is prominent according to the total number. It means that, water transportation and communication linkages with Dhaka Metropolitan Areas basically depended on the waterways through launch and boats.

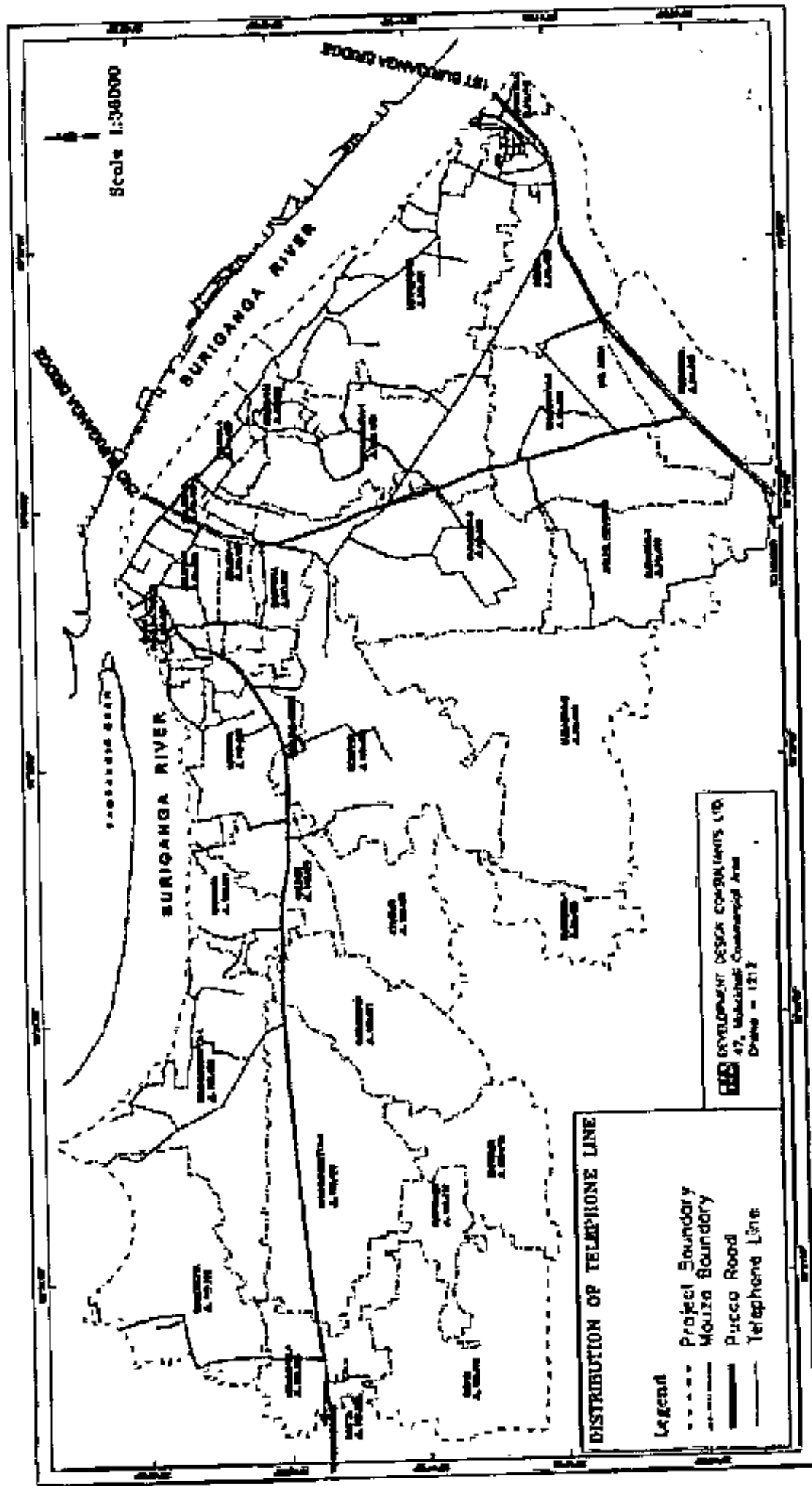
Gas: There is a Titas Gas Transmission and Distribution office in the central area of Zinjira *mouza*. Existing network coverage does not include Atasur *mouza*. Because, the network followed *pucca* roads and semi *pucca* roads. As there is no *pucca* road in Atasur *mouza*, local people are deprived of gas service. But low pressure of supplied gas in many times of the day is hampering the speed of industrialization in Zinjira. **Map-5.5** shows the gas distribution network of Keraniganj.

Electricity: In the area, Rural Electrification Board is performing the role of electrification. There is an electric sub-station in the Gokpur *mouza*. Most of the area is under electrification facility but acute load shedding is hampering the day to day life and growing industrialization. **Map-5.6** shows electricity distribution system of Keraniganj Upazila.

Telephone: Earlier there was analog telephone service in the area but coverage was poor. In 2001, after the opening of the bridge, rapid urbanization demanded faster telecommunication service. In the early 2006, two telephone exchanges were opened and digital system was introduced. Coverage of the service is extending day by day. **Map-5.7** shows distribution of telephone line of Keraniganj Upazila.

Water Supply: There is no central water supply system in the study area. Individual pumping with hand tube well is the major source of drinking water. Perhaps all the settlements have their own hand tube well within the residential premises. People who are nearer to the rivers are using river water for their daily necessities other than drinking. Due to high pollution, using of river water is becoming impossible.

Drainage and Sanitation: Underground drainage system is absent in the study area. Existing canals are performing the major role of natural drainage. All the settlements have their own sanitation system in the premises and most of them are septic tank and pit latrine system. The septic tanks are cleaned once in a year dumping the night soil into the river or canal whichever is nearer. In 2006, an initiative was taken to cover the Aganagar and Zinjira areas under drainage network. The work was not fully completed and the built up portions are not properly used. Again, most of the canals have been filled up by solid



Map- 5.7 Distribution of Telephono Line Keraniganj Upazila.

waste or land developers which create water stagnation during monsoon. In Atatur area, there is no drainage and waste disposal system. People are using pit latrines and nearby low lands for defecating and solid waste disposal.

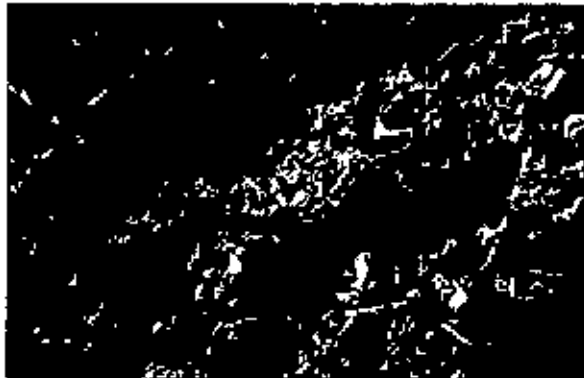


Photo-5.10: Drainage condition in Zinjira Bazar



Photo-5.11: Dumping of solid waste to fill low lands and canals in Zinjira

Post Office: One post office is located in the Mirerbagh *mouza*. The Sadar Post office in the Sadar *Ghat* area of Dhaka city is near the locality. People of Zinjira and Atatur are using both as per their convenience.

Fire Service: One fire service station is in the Konakhola *mouza* near the Upazila Headquarters. It is about six km from the densely populated central area and the fire service station is connected by a single road. It was opened after the construction of the 2nd Buriganga Bridge.

Launch/Boat *Ghat*: There are some formal launch/boat *ghats* in Zinjira, Brahmanakata and Barisur *mouzas* of Keraniganj. Besides, a large number of non-formal boat *ghats* are there in the study area. i.e. Godara *ghat*, Aganagar *ghat*, Golam Bazar *ghat*, Wise *ghat*, Masjid *ghat* etc. Launch *ghat* in Malancha *mouza* is more prominent than others but there is no specific official recognition of these *ghats*, rather launches and boats are using the riverside of a market place as the *ghat*.

Ferry *Ghat*: One ferry *ghat* is found in the Char Ragonathpur *mouza* on the Buriganga River with the covered area of 0.10 acres. Before opening of the 2nd Buriganga Bridge, this ferry *ghat* was the only road transportation linkage between Dhaka City and Keraniganj.

Other services: Except electricity, all other urban service can be rated as below poor level. But improved road communication has ensured better bus service after the opening of the 2nd Buriganga Bridge. But some other facilities like drainage, sanitation, gas are still in a degraded condition. Hospital, clinics and educational facilities have increased after 2001, but still these are insufficient in comparison to increased demand.

5.1.9 Housing Projects

After the opening of the 2nd Buriganga Bridge, Dhaka city is at 15 minutes' distance from Keraniganj. Though land value in Keraniganj has increased rapidly in recent times, still it is lower than other neighboring areas i.e. Savar, Ashulia, Gazipur and Narayanganj. As a result, land developers and real estate agencies have identified Keraniganj as a potential area for future urbanization and residential development. During the questionnaire survey, most of the respondents said that, land filling and new housing projects are the most visible impact of the 2nd bridge.

Private Sector Housing: Presently altogether 40-50 housing companies are working in the whole Upazila. Rapid land development is increasing demand for vacant land and population density. Most of the low land adjacent to major communication network is already filled up. Currently the following major housing companies are working in the Upazila:

- Anowar City (Co.)
- Mawlana Real Estate (Co.)
- Amirabagh Model Town Project
- Mohammadi Developers (Co.)
- Espahani Housing Project
- Basundhara River View Project
- Prime City (Co.)
- Dhaka Housing Project
- South Town Project
- Bhuiyan Nagar (Co.)
- Ramjan Nagar (Co.)
- Keraniganj Model Town (A K. Trading Corporation.)

Public Sector Housing: All of the housing companies in Keraniganj are private except the Jhilmil project. RAJUK took up this project considering the demand for residential areas after the construction of the 2nd Buriganga Bridge. But even after six-seven years there is no significant development for completion of this work. RAJUK acquired the land



Photo- 5.12: Dredging pipe line for land filling in Zinjira

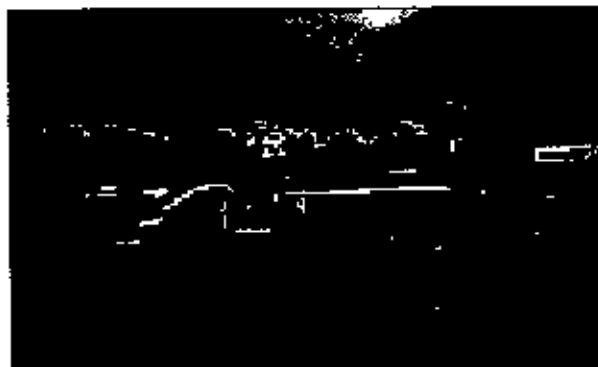


Photo-5.13: Ready plots for housing project in Zinjira



Photo- 5.14: Dredging pipe line has just started to grab the agricultural lands in Atasur

and some extent of land development has been conducted so far. In 1999, RAJUK acquired 381.19 acres of land in Chunkutia and Suvadda *mouzas* for “**Jhilmil Residential Project**” project. It is adjacent to 1st Bridge to Mawa Road in Subadda union. Already more than three thousands of plot seekers have invested their money to obtain developed land. But Due to some procedural complexities like land acquisition, mismanagement, court cases, even after eight years there is no significant development yet. As this is the only government sector housing project in Keraniganj area, many people from middle income level deposited their money for getting low cost housing who are frustrated now. Altogether three thousand plot seekers applied for land and now they are losing their interest. Rather, as private sector housing groups are presenting attractive offers, they are willing to shift towards those new housing companies. RAJUK informed that, they lost

some time for court cases against this project during land acquisition phase. But very soon they will start the land development work.

Housing Projects in Relation to Study Areas: Housing projects are not developing in same pace all over the study area. Areas far from major roadway are naturally lagging behind in pace. But rapid urbanization is going on in areas adjacent to the 2nd Bridge and highway. No planning rules and restrictions are followed there to fill up the low lands and housing developments. Though there is huge potential for planned urbanization and residential development, due to lack of proper planning and regulatory control on development activities, potential areas of Keraniganj like Suvadda, Chunkutiya, Golan Bazar, Aganagar, Kathuria, Kaliganj are turning to densely populated unplanned areas like Zurain, Hazaribagh, Postogola, Lalbagh of old Dhaka. The situation is deteriorating day by day and environmental pollution, crimes are coming up as associated problems. This change has also touched the existing accommodation pattern of residents in areas like Zinjira. Semi-pucca buildings are being turned to pucca or multistoried buildings to get higher rent. But, the situation is different in areas beyond this rapid growth. In reference area Atasur, most of the residents are local. Only few people have just started to buy low land for further development. Inhabitants still depend on agriculture and there is no change of accommodation pattern or living standard of local people.



Photo-5.15: Multistoried buildings for high income group have already started to come up in Aganagar-Zinjira area



Photo-5 16 : Atasur village is still untouched from the activities of developers

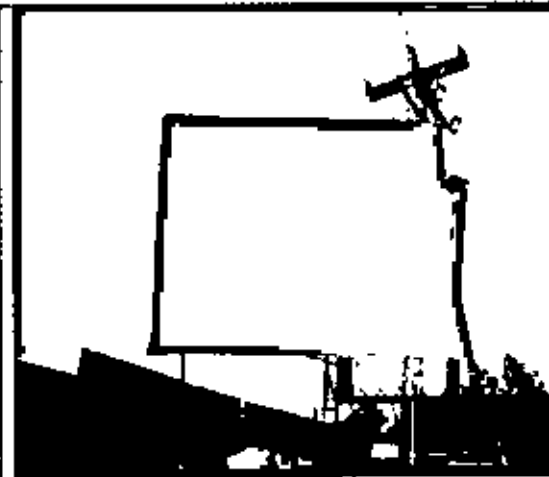
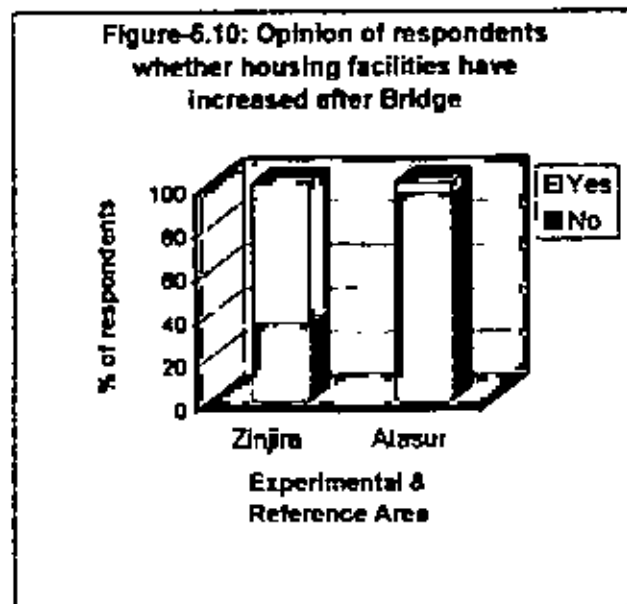


Photo-5.17: Large billboard for advertisement of real estate business is a common scenario in Zinjira area



Photo-5.18: Housing project in Zinjira-Aganagar area



Source: Questionnaire Survey, 2008

Figure-5.10 shows opinion of respondents whether they see any change on the increased housing facilities after the bridge. About 65 percent respondents of Zinjira showed positive response. In their opinion, new opportunities are coming with the improved accessibility after the bridge. So, new residential buildings are developing to fill up the increased demand of migrants and local residents. Some of the residents have different opinion. They think that, no significant facility is visible except some multistoried building of housing companies targeting high income groups. Again, most people of

Atasur also said 'no' as there is no such development after the bridge due to lack of significant demand and following steps.

Impact of Unplanned Development:

Unplanned land development is covering low lands and agricultural lands. For example: in Kalindi Union, there was 741 acres of agricultural land in 2004 which has reduced to 494 hectares in 2006. In Aganagar, there is no agricultural land now as most of those have already turned to other uses. It is assumed that, if this trend is continued, most of the agricultural lands will turn to residential or commercial use within the next five-seven years. Again, Encroachment of low lands and canals are causing water stagnation. Naturally Keraniganj is a highly flood prone area. Unauthorized land development has deteriorated the situation further. Besides, Development of multistoried buildings and markets are creating pressure on ground water facilities. Most of the housing projects are continuing their activities without prior approval from RAJUK. They conduct their activities by 'managing' local administration. The structure plan does not permit high rise in Keraniganj area; the prescribed use for the area is development maintaining original characteristics. So, utility supplying agencies are unable to keep pace with increased demand. Haphazard growth is causing traffic jam and congestion on bridge and adjacent areas. This trend is dampening the potential of Keraniganj area.

5.2 Impact of the Bridge on Social Status of Keraniganj

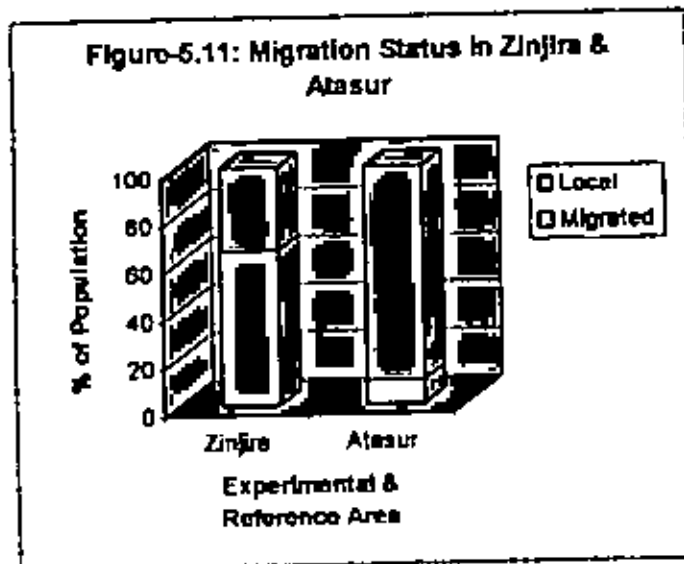
In Keraniganj, social bondage is very strong. As the locality is adjacent to old Dhaka, a great resemblance is found in the livelihood pattern of the two localities. After the construction of bridge, a spate of urbanization has started to change the old culture, social structure and living standard of the society of Keraniganj. This change is prominently observed in the Aganagar, Zinjira, Kalindi and Suvadda unions which are closely associated with the bridge. But the areas far from the bridge are still unchanged in their livelihood pattern and social structure. This scenario was found when such an area like Atasur *mouza* of Kalindi union was surveyed.

The tremendous development which has occurred in roadway communication after 2001 has ensured expediency in local life as well as change in the social life of the people. Modernization has arrived in most parts of the Upazila which has created a significant impact on the social life of the area.

5.2.1 Migration

Improved road communication has accelerated the growth of trade, commerce, industrialization and employment opportunities of Keraniganj area. People of different type and status are rushing towards Keraniganj which was previously limited to the lower income group. Many people have migrated from greater Dhaka as living is less expensive here. Some of them have made permanent residence here. Housing companies are developing multistoried buildings to accommodate high income migrants. Local people of low income are shifting to comparatively remoter parts of the area. Many small industries of Old Dhaka have shifted here like shoe, rickshaw seats, bi-cycle, ready made garments. Workers of these factories have also shifted here to reduce commuting cost and time, house rent and living expenditure. In four unions this migration rate is higher than other parts of Keraniganj.

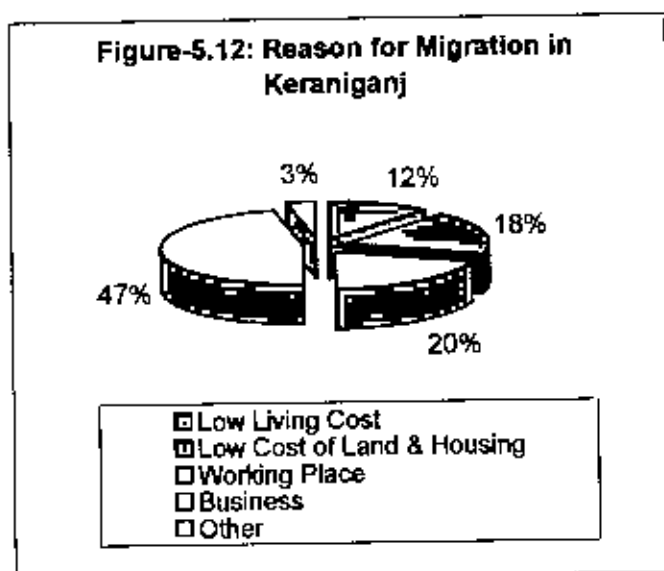
In Suvadda, Aganagar and Zinjira union, migration rate is very high and after the construction of the bridge, internal migration is also observed in Aganagar and Zinjira areas. People of different unions of Keraniganj have shifted to this area as they are employed here in different business centers and government, non-government offices. As the area has highly potential for trade, many of the working people have started business beside their jobs.



Source: Questionnaire Survey, 2008

Some of the old inhabitants have shifted to Zinjira for better educational and urban facilities which are yet to reach the other unions. Increase of land value has caused external migration in Zinjira area. Many people specially from the lower income group

have sold their land at a high price to the developers or business centers. In their opinion land price of Zinjira has increased 20 times in the last five years. So it is possible to buy 3/4 *bighas* (1 *bigha* =±26 decimals) of land in the interior part of Keraniganj (i.e. Baghor, Konda union) if they sell 5/6 decimals of land in Zinjira area. For example, Badsha Miah was a worker in a small shop in the place near where bridge has been constructed. He sold his land when its price increased after the construction of bridge and shifted to Barouhati village of Basta union (Questionnaire survey) Figure 5.12 shows that, majority of the people have shifted to Keraniganj for increased opportunity of business. But a different scenario is seen in comparatively remote areas like Atasur *mouza* of Kalindi union. This area is neither adjacent to the bridge nor the highway. Natural growth of population is the only reason for increased population here.



Source: Questionnaire Survey 2008

In 2000, the total population of Atasur was 500-600 which has increased to 1000-1200 in 2008 (Keraniganj Upazila Parishad) Recently land filling has started in the vast low lands surrounding the area which might increase 50-100 migrated people mostly from greater Dhaka.

5.2.2 Educational Facilities

In the last years tremendous development has been observed in the educational sector of Keraniganj. Increased income and employment opportunity are acting as an incentive for the poor and middle income groups to send their children to school. According to the local administration, in the last five years, six new colleges, four high schools and colleges, 34



higher secondary schools have been constructed. Technical section has been opened in three old high schools.

At the primary level, renovation work was completed in 106 schools among 108 government primary schools. Besides, five new community schools have been constructed and ten non-government primary schools are under the process of government registration. Under government allocation in FY 2005-06, two more classrooms are being constructed in 25 primary schools and more funds have been allotted for the same work in 32 schools. Including one Alim and Dakhil Madrasa, 52 new educational institutions have been constructed in Keraniganj in the last five years.

Educational environment of these schools have also changed in the last years. DDC Survey, 2000 shows that before the bridge, most of the institutions preserved a rural character on the overall environment and physical establishment. Old structures with non-availability of sunlight and natural wind, congestion and absence of sanitation facilities were the major physical components of those schools. Social condition and physical environment made the schools get lower number of students. But the scenario has changed completely in the last few years. Due to construction of the bridge, increased accessibility has ensured better employment and income opportunities. Schools have been made more spacious and the environments of those are healthier than in the previous time. This has promoted parents to send increased number of students to schools. Literacy rate and rate of educated people are increased in recent times. Now schools are getting increased number of students. Table-5.11 and Table-5.12 depicts education status of the study area

Table-5.11: Rate of Educated People in Keraniganj Upazila

Gender Type	Percentage in 1991	Percentage in 2007
Male	24	39
Female	14	42
Average	38	71

Source: Bangladesh Population Census, 1991 (Community Series), Dhaka Zila and Keraniganj Upazila Parishad

Table-5.12: Literacy Rate of Keraniganj Upazila

Gender Type	Percentage in 1991	Percentage in 2007
Male	60	55
Female	20	30
Average	80	85

Source: Bangladesh Population Census, 1991 (Community Series), Dhaka Zila and Keraniganj Upazila Parishad, 2007

Increased educational facilities and income opportunities have created a significant impact on the educational status of female groups. People have become more aware in the last five years. Statistics show that the progress of literacy rate of females is much higher than the males. Before the construction of the bridge, all students interested to get higher education had to cross the river by traditional boats and come to Dhaka. This inconvenience discouraged parents to send their daughters for education in Dhaka. This problem became acute specially in rainy season when female students had to face problem in coming back home at the end of the day. Now, due to improved communication anyone can come to Dhaka within 15 minutes which has encouraged parents to go for higher education for their daughters. Besides, NGO activities have created social awareness and women's empowerment over the last years has increased female students. All these have ensured a dynamic change in the overall education environment and special impact is perceived on the female students. But a different picture is perceived for the male students. Increased opportunities of trade, business have encouraged the males to go for easy income opportunities. They are thriving in business at an earlier age. A trend is also seen of going abroad for employment. Due to construction of the bridge, income and employment opportunities have increased. This has changed the economic structure and males are less interest to get higher education. So females are doing better in the education field. Traditionally people of old Dhaka and also Keraniganj prefer to arrange marital partners from within their area. But as girls are going for higher education more than boys it is creating a different kind of social problem. Parents are facing problems in trying to arrange marriage of their daughters as there is a scarcity of educated males.

5.2.3 Crime

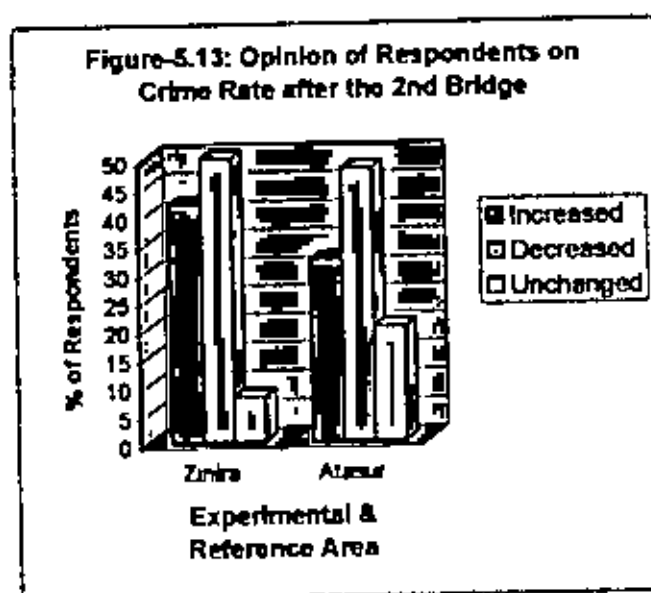
After the construction of the bridge, its impact is also found on the crime scenario of the area. Some inhabitants think that crime has decreased due to the bridge. Again different opinion is also found as some of them think it has ensured increased accessibility of the criminals. A greater portion of the residents think that many of the local outlaws have changed their life style and returned to normal life due to increased income and employment opportunities. Some of them think that the bridge has allowed outlaws from other districts, after creating an occurrence there to take shelter in Keraniganj. Some of their opinion is that through the bridge criminals from outside are coming to Keraniganj and after committing a crime in the Upazila they leave quickly. Before the bridge, it was difficult for them to go back after committing a crime here.

Table-5.13: Crime Statistics of Keraniganj Upazila in Last Years

Year	Dacoity	Robbery	Stealing	Murder	Riot	Others	No. of Court Case
2001	5	7	39	40	5	442	538
2002	22	3	67	50	10	415	567
2003	7	6	34	47	13	471	509
2004	6	5	53	44	5	420	533
2005	7	5	85	31	9	425	562
2006	10	9	90	25	8	437	579
2007	6	7	72	20	7	418	530
2008	8	5	68	18	5	412	516

Source: In-Charge, Keraniganj Thana (North)

Crime status of Keraniganj is shown in Table-5.13. Table shows that, in 1999, law and order situation was seriously deteriorated in Keraniganj area which was improved in next year. A positive scenario was visible in following years except the year 2002 and 2006. In these years, antisocial activities specially stealing, dacoity and riot were increased. It is a positive matter that, in following years after the opening of the bridge, crimes like dacoity and murder have been decreased significantly. It indicates that, better communication and improved income opportunities created a significant impact on the law and order situation also.



Source: Questionnaire Survey 2008

Figure-5.13 shows opinion of respondents in Zinjira and Atasur regarding crime status before and after the bridge. It indicates that, majority of the local residents thinks the

Bridge is acting significantly for reducing crime in the Upazila. Again, according to the local thana, the bridge is working against the outlaws. Before the construction of the bridge, it was difficult to run after a criminal as the river was creating an obstacle. Unavailability of adequate police force and other logistics support meant it was difficult to chase and catch a criminal. Sometimes captured outlaws told that his associates were at the other side of the river, but it was not easy for the police to cross the river and catch them. Sometimes it took much time and in the meantime the associates fled away. But the scenario is changed now. Now police can chase the associates by road which is less time consuming and more convenient. But sometimes the opposite scenario is also found. In many cases criminal/s waits on the bridge for their associate and to join from outside Keraniganj. Then the whole team commits a crime in Keraniganj and goes back to Dhaka or any other district. Again, many of the local residents complained that they found dead bodies on the bridge during their morning walks. These types of murders take place outside Keraniganj and the killers leave the body at night on the bridge. In this way, the bridge has become a crime spot. A special impact of the bridge is found on violence against the women. The bridge acts as a point for kidnapping female garment worker of Keraniganj. A number of antisocial wait on the bridge with microbus/private car and they kidnap the workers when they return home at Old Dhaka after their duty.

Earlier Keraniganj was under one thana to look after the laws and regulations of the Upazila. In 10 December 2006, the thana was divided into two and they are named as Keraniganj North and Keraniganj South. The creation of a new thana has ensured better logistics and other support against the crime. Local people demand to arrange police or RAB on the bridge to protect different types of crimes on bridge. Then it would not be possible to use the bridge as a point of crime and will do a lot for protecting people on the bridge at night.

5.2.4 Social Structure & Health Facilities:

Better accessibility in Keraniganj has ensured better social facilities and services as well. Increased income opportunities have increased affordability which has created demand for increased social facilities. To meet the demand of people, improved health facilities in private sector have developed. A community centre has been built for the social activities of people and two other are under construction. Previously high income people of Keraniganj went for better treatment facilities to Dhaka. Now, increased opportunities have ensured accessibility of middle and low income group to these facilities as they are available in Keraniganj. Poor people are also facilitated at Upazila and Union health complexes as the number of these institutions has increased in the last five years. Improved health facilities are helping a lot the disadvantaged people. Besides, the

government provided Upazila and Union health centers, NGOs and voluntary health centers are working for providing better health services to poor female and children Table-4.16 shows comparative analysis of health facilities in Keraniganj area before and after the bridge. Again, Table-5.14 shows comparative status of other social structures of Keraniganj area

Table-5.14: Health Facilities in Keraniganj Upazila

Sl No.	Type of Facility	Total Number	
		Before Bridge in 1991	After Bridge in 2007
1	Maternity Centre	64	77
2	Upazila health Complex	01	04
3	Union Health Centre	03	04
4	Voluntary Family Welfare Centre	08	15
5	Union Clinic	02	06
6	Private Clinic	12	30
7	NGOs working in Health Sector	03	10

Source: Keraniganj Upazila Parishad, 2008

Table-5.15: Other Social Structures in Keraniganj

Sl No.	Type of Facility	Total Number	
		Before Bridge in 1990	After Bridge in 2007
1	Religious Institutions		
	-Mosque	555	640
	-Temple	96	96
	-Eidgah	59	59
	-Graveyard	104	104
	-Cremation Ground	20	20
2	Community Centre	0	03 (Most of them are located in Aganagar-Zinjira Areas)

3	Cinema Hall	01	02
4	Bus Stoppage	01	03
5	Public Library	0	01 (Operated by a voluntary social organization)
6	Post Office	22	22
7	Telegraph Office	01	01
8	Club	01	05

Source: Keraniganj Upazila Parishad, 2008

These social institutions and increased affordability are doing a lot for improving the living standard of people. So lives are changing day by day. But unplanned land filling are occupying the open spaces and vacant lands which are decreasing the scope of outdoor games and recreation facilities. People of different groups specially the children, young and old gathered at fields in the afternoon for playing, chatting and women gathered in the open spaces near their houses. This tradition formed the social bond of people. Increased occupancy of the low lands and playfields by the developers are destroying the scope of outdoor social interaction and playing facilities. As a result, social bond is changing and interaction among the people is decreasing day by day. This is also an impact of increased urbanization in Keraniganj.

5.2.5 NGO Activities:

Before the construction of the bridge, the number of voluntary organizations working in Keraniganj was 135, now it has increased to 315 including non-governmental organizations. Some of the prominent NGOs working in that area are Sajeda Foundation, Aasha, Proshika, BRAC, SAVE and Matrimongol NGOs and the voluntary organizations are working mainly in micro-credit, agriculture, primary education, maternity welfare, family health care, forestry and awareness generation. Activities of these NGOs have done a great job in social development specially in women's empowerment of that area. Now poor women are contributing to their family income which has improved their status in the family. Before construction of the bridge, number of NGOs working in that area was less. Improved accessibility in all over the Upazila has encouraged increased number of NGOs and reach to general people in all stratus of the society. Micro-credit has accelerated small business and cottage industries. People are now capable to sell their products within very short time going to Dhaka which was not possible before the construction of the bridge. In the agricultural sector active NGOs are SAVE, BRAC and Proshika. BRAC and Proshika are also working in the micro credit sector. Proshika is working in Ruhitpur union for agricultural development (Keraniganj Upazila Parishad)



Photo-5.19: Most of the private health facilities came after the bridge

5.3 Impact of the Bridge on Economic Condition of Keraniganj

After the construction of the 2nd Bridge in Keraniganj area, rapid development in communication has accelerated the growth of business, industry and trade opportunities. Infrastructural development has started in Keraniganj in late 80's and which reached in better position when the 2nd Buriganga Bridge was constructed. Within the last five years, development has touched every corner of society. Now there is no village in Keraniganj without electricity. Education, industrialization, trade, social progress, road; in each sector there is positive change after the increased accessibility ensured by the bridge.

Rapid industrialization and business opportunities have increased average income level of local people and affordability in family maintenance. Impact of the bridge is viewed in the following aspects in the economic situation of Keraniganj:

5.3.1 Industrialization

After the construction of bridge, within the last five years, hundreds of factories, investors have rushed to Keraniganj and still new industries are coming up. Improved communication with the rest of the country, close proximity to big towns like Dhaka, Narayanganj, availability of labour force are the factors working to make Keraniganj a rising industrial area. To reduce pressure on Dhaka, the Government is also trying to use the potential of Keraniganj. So on 26 acres of Ruhitpur, Keraniganj, the BSCIC Industrial Estate is developing under the supervision of relevant authority. Table-5.16 shows status of industrialization in Keraniganj area before and after the bridge.

Table-5.16: Status of Industrialization in Keraniganj Upazila

Type	No. (Before Bridge in 1995)	No. (After Bridge in 2005)	Remark
Jute Mill	02	03	The third one was constructed in 1998
Textile Mill	02	01	
Handloom	500	200	
Dockyard	45	60	
Brick Field	200	150	8/10 Brickfields have acquired by Bashundhara Housing Group in Keraniganj. Some of those could not fulfill the new chimney instructed by Government which requires Tk 50,000.00
Cold Storage	8	4	-
RMG units	300-400	1500-2000	-
Re-rolling & Steel Mill	0	10-12	-
Melamine	0	4-5	Diamond Melamine, Bangladesh Melamine.
Plastic Seat Cover (Rickshaw, Bi-Cycle)	4-5	20-25	Most of them are shifted from the old Dhaka.
Workshop (Construction Material, i.e. Grill, steel frame of door, window)	10-12	30-40	Construction work of housing companies and new residents have increased the demand of these materials.
Shoe making	4-5	25-30	Most of them are shifted from old Dhaka.

Source: Keraniganj Upazila Parishad Office

Readymade Garments Industry

In the last five years, there is tremendous development in the Ready Made Garments (RMG) sector of the Upazila. Several thousands of small garment production units are located in south Keraniganj. The production units are small and concentrated in Aganagar, Char Kalinganj, Khejurbagan areas. Their main items of production are pant, shirt, t-shirt,

polo shirt, salwar-kamiz, *borkha*, *fatua*, panjabi, children's dresses, warm clothes which are meeting the demand of local market. Garments produced in these factories are not only meeting the demand of the local market but also are being exported to countries of the Middle East, Europe and America. During this period, many production units of Old Dhaka have shifted to Keraniganj. According to Upazila Parishad office, garments of Keraniganj are exported to seven countries of the world. Foreign buyers and visitors go to Keraniganj to visit the factories and select samples to order. Low priced garment products of Bangladesh are thus shipped to different parts of the country. Previously garment items of Keraniganj were supplied to the local market only. Poor communication network was a major obstacle to transporting raw materials, movement of workers and interaction with foreign buyers. The construction of the bridge has ensured better accessibility for buyers, supply of raw materials to the factories and also delivery of the produced items.



Photo-5.20. Garments production and sales centre at Zinjira



Photo-5.21: New garments market under construction

The evolution of garment industry in Keraniganj began after the liberation war. Some local entrepreneurs started to make garments from old cloth. This became popular in the local market and to meet the increased demand from all levels of society, they started to make garments from new cloth. As the numbers of garments manufacturers increased day by day, the numbers of shops increased. After the construction of the bridge, increased accessibility has accelerated this growth. Now, in two unions of Keraniganj, Aganagar and Zinjira there are thousands of small-medium and large garment production units, multistoried garment markets are under construction. In the existing markets of Aganagar and Zinjira there are thousands of shops. Zila Parishad market, Alam Tower, Bikrampur

107275

Plaza, Century Market, Stone Plaza are under this category. Nowhere else in Bangladesh such big garments markets exist. The main production items of these garments are: shirts, pants, jackers, blouses, borkhas, ladies frocks etc. About two and a half lakh workers are engaged in this sector. Strong potential exists in the garments sector of Keraniganj. But in most of the garments production units' workplace safety and healthy environment are not ensured as the area is meeting most of the local market demand and also exporting a lot, planned development for a "RMG Production and Sales Centre" will ensure effective utilization of the potentiality of the area.

Other Industrialization

Besides garments production centres, there are some industries located specially in Teghoria union adjacent to Dhaka-Mawa highway. Re-rolling and steel mills, melamine factories are of special importance here. Hundreds of workers are employed here. In the dockyard industry of Keraniganj there are 55 thousands of workers.

During questionnaire survey, some renowned industrialists of Keraniganj say that if Planned industrialization takes place, it would create employment opportunity for 20 lakh people. To use this potential the Government has taken the initiative to establish 'BSCIC Industrial Area' in Sonakanda area of Ruhitpur union. The area is being constructed above flood level. It is hoped that this Industrial area will help tapping the huge potential of Keraniganj area.

Areawise Industrial Development

According to RAJUK Survey in 2000 the union wise land area under industrial use in Keraniganj is as shown in the table-5.17.

Table-5.17: Existing Areas of Industrial Establishment According to the *Mouzas*

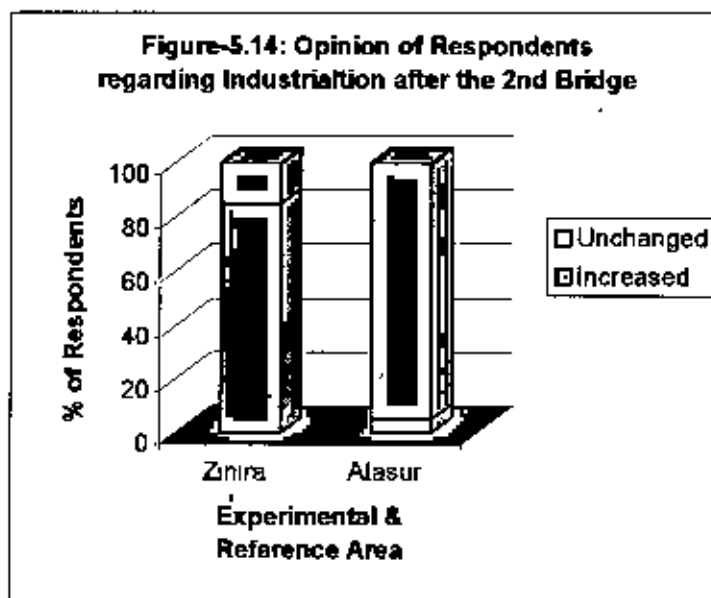
JL No	Name of <i>Mouza</i>	Area in Acre						Total
		Fact ory	Mill	Industry	Dock yard	Brick field	Poultry	
Zinjira Union								
425	Mandail	0.36	0.79					
427	Dakpara			0.42				
428	Char Raghunathpur	0.07						
429	Zinjira	0.22		0.47	1.87			2.56
Kalindi Union								
422	Atasur	-	-	-	-	-	-	-

Source: Engineering Survey, DDC, 2000

According to DDC survey in 2000, about 46.09 acres of total land was under industrial development. This area has been increased up to 5 to 6 times in 2007. Different types of factories, mills, dockyards were the basic category of factories in 2000. This type has included furthermore industries in type and nature. According to their survey, 11 *mouzas* were occupied with industrial development. Among these three *mouzas* named Kaliganj, Mirerbagh and Zinjira were the most important development areas. Land elevation of these 3 *mouzas* is generally higher than the other *mouzas* of the study area. The mill in the Mirerbagh *mouza* is a jute mill occupying 26.05 acres. Other factories and industries include small-scale garment factories, furniture factories, iron and steel industry, brick fields and factories of other daily necessities.

No Industrialization in Atasur

But no industrialization was found in Atasur *mouza* of Kalindi union in 2000. Up to yet, this scenario has been unchanged. In the field survey it was found that there was no significant development of trade and industry in Atasur area. People were living on agriculture, service in 2000 and still they are doing so.



Source: Questionnaire Survey, 2008

Industrialization is happening alongside the Dhaka Mawa highway and the adjacent areas. This highway passes through Suvadda, Teghoria and Basta union of Keraniganj Upazila. The highway is connected with the 2nd Buriganga Bridge which is passes through Aganagar-Zinjira area. Atasur *mouza* is far from this highway and outside the buffer zone of the bridge and highway. There was no road network in Atasur area in 2000 and still the situation is unchanged. Besides gas, water supplies are not available here. Electricity exists but load shedding is very acute.

In the rainy season only the village remains above water as it is on highland but the whole surrounding area goes under water. These entire scenarios are creating obstacles for industrial development in Atasur area. Again, rapidly developing areas like Zinjira, Kalindi unions are within 3-6 kms of Atasur. So people of Atasur are rushing towards these areas for employment opportunities. Figure-5.15 shows opinion of respondents regarding industrial development after the opening of 2nd Buriganga Bridge in their respective areas.

5.3.2 Trade & Commercialization

Improved accessibility has accelerated the changing scenario of poor and deprived status of Keraniganj. Rapid industrialization has increased income levels of people. Markets with shops of luxurious commodities have developed in Agangar, Kaliganj, Suvadda and bringing facilities of modern life to the Upazila. Sales Centres of electronic equipment, multistoried shopping mall; modern recreational facilities are developing rapidly to meet local demand. Table-5 18 shows comparison of commercial establishment before and after the bridge.

Table-5.18: Commercial Establishment before and After the Bridge

Mouza	Area in Acre											
	Hotel		Bazaar		Food Storage		Shopping Mall & Other Commercial Centre		Bank		Mixed	
Year	2000	2007	2000	2007	2000	2007	2000	2007	2000	2007	2000	2007
Zinjira	0.27	1.30	24.00	35.00	-	0.11	1.92	3.50	0.27	0.90	0.82	3.95
Atasur	-	-	-	-	-	-	-	-	-	-	-	-

Source: DDC Survey 2000 and Keraniganj Upazila Parishad, 2007

Increased trade and commercialization has ensured better employment opportunities in Keraniganj. To use this employment opportunities the necessity of developing skilled manpower is increasing. In Hazratpur, vocational training institute is being constructed at a cost of taka 27 crore. Thousands of unemployed young people will be able to get training from this centre.

5.3.3 Changing Income Level

Infrastructural development has created opportunities for trade and commercialization as well as income level of general people has increased 2/3 times. From the questionnaire survey it was found that from lower level to higher level, income is increased depending on the status of the respective group. Appendix-2 shows trend of changing income level of the residents of Keraniganj.

No trade and Commercialization in Atasur: Income Level is Unchanged

The growth of commercialization and trade is changing the lifestyle and living standard of Keraniganj's people. But after the bridge, as there is no trade and commercial development in Atasur *mouza*, living standard there is almost unchanged. But the day laborers and rickshaw pullers who go to Zinjira area are getting much income than earlier.

Impact of Bridge on Badamtoli *ghat* Area: Income level has decreased

Due to the bridge, significant improvements are seen in the income level and occupation pattern of Zinjira area. But a reverse situation is viewed in the commercialization and income level of Badamtoli *ghat* area. Table-4.22 shows status of Badamtoli *Ghat* before and after the Bridge.



Photo- 5.23: Badamtoli *ghat* has lost all of its attractions after the construction of 2nd bridge



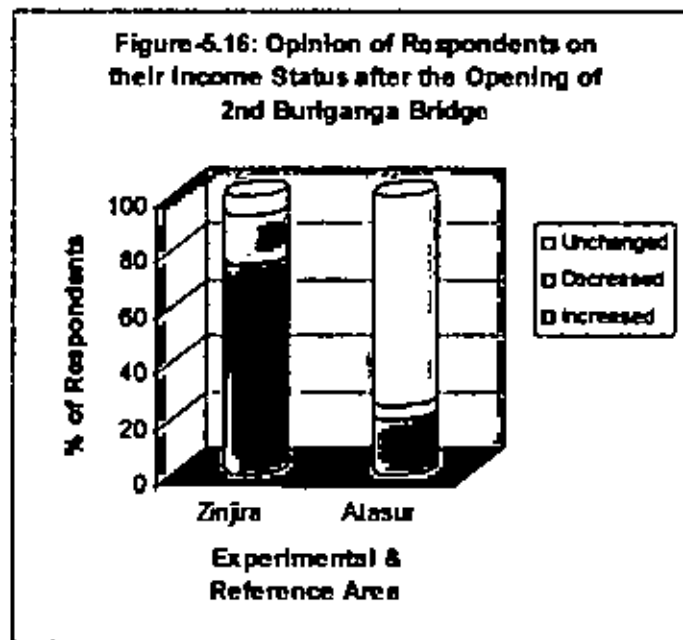
Photo-5.24: Transportation of rice bags is the only activity of Badamtoli *ghat* now. All other functionalities have been shifted to 2nd Buriganga Bridge (seen far in the photo)

Besides there is a significant change in the occupation pattern of the people working in river *ghat*. Most of the people employed in the transportation of goods and human became unemployed after the bridge construction. Some of them returned back to their own district and took up other professions. Some of them continued to stay permanently in Badamtoli *ghat*, Keraniganj and work day labours in fruit shops, rice shops, rickshaw pulling etc. Still there are about 100 people working in the Badamtoli *Ghat* but their income level is decreased by a significant amount.

Table-5.20: Badamtoli Ghat before and after the Bridge

Aspect	Before Bridge	After Bridge
Number of People Working in Badamtoli Ghat	5000	100
No of Boats Engaged for transportation of goods and people	450-500	40-50
Use of the Ghat	Goods and people transportation from Northern districts i.e. Chandpur, Madaripur, Faridpur, Pabna. Goods were carried in the whole night. Mainly loading unloading was conducted in the early morning. The biggest Rice Godown of Dhaka is at Babubazar which is adjacent to Badamtoli ghat. So all rice bags came through this ghat. The wholesale shops, manufacturers of Islampur used this ghat to send their goods.	Now, most of the inter district transportation has been shifted to the bridge. Rice and whole sale clothing are carried by the road way transportation as it is time saving and less troublesome. Only the goods and commodities like vegetables, fruits, RMG goods are carried over the bridge from different unions of Keraniganj to Dhaka. From Bansur, Mandail, Kholamura vegetables come and carried to Dhaka using this ghat. Most of the transportation occurred in between 10-11.00 a.m. People also cross the river through this ghat to avoid congestion over the bridge. No significant transportation conducted in nights.

Source: Questionnaire Survey, 2008



Source: Questionnaire Survey 2008

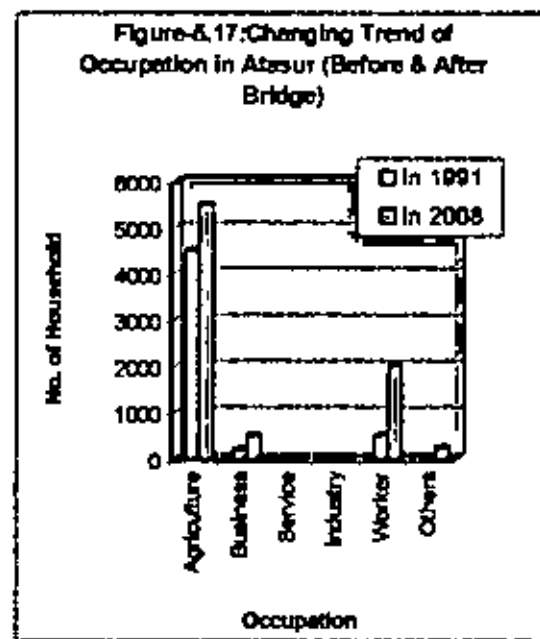
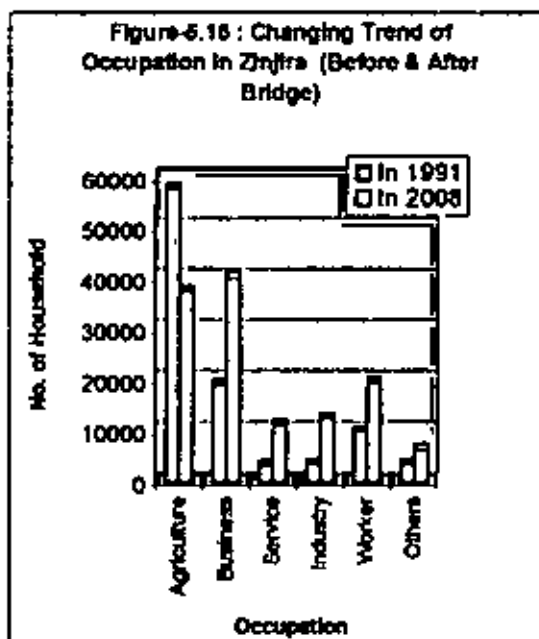
Figure-5.16 shows feedback from the respondents of Zinjira and Atasur whether the bridge could bring any significant change on their income status. It depicts that, most of the respondents of Zinjira could see a positive impact after the opening of the bridge in 2001. But opposite opinion was also found. During the questionnaire survey the caretaker of *ghat* told that their income level has reduced to one third than their previous income. But they also mentioned that the bridge has changed the total socio-economic scenario of Keraniganj. The bridge has reduced the transportation cost and harassment of day to day communication of people. According to the *ghat* people transportation of goods by bridge is 30% less costly than the river way. Besides it is time saving and less troublesome. Again during the stormy weather people suffered a lot to cross the river. All these problems are solved by the bridge now. Again, opposite scenario was found in Atasur area. There is no significant change in their income status as no such opportunity was created.

Some of the residents specially in the Babu Bazar area also showed negative approach towards the bridge in relation to their income status. They told that, trade and commercialization have reduced due to the congestion after the bridge. They also think, traffic jam is a regular scenario in Badamtoli *ghat* as it is a part of Old Dhaka and the roads are narrow. Besides, loading-unloading of goods and haphazard parking caused traffic congestion here. According to the business people of Badamtoli *ghat*, after the bridge construction, 15% congestion has increased which has a significant negative impact on their business. Earlier it took 15 minutes to go any place crossing the river, now

due to congestion; people have to wait near the bridge for 30/35 minutes. Rice traders and other business people urged for immediate steps to reduce congestion on the bridge which would accelerate their business and they would also be able to get the fruitful outcomes from bridge.

5.3.4 Changing Pattern of Occupation

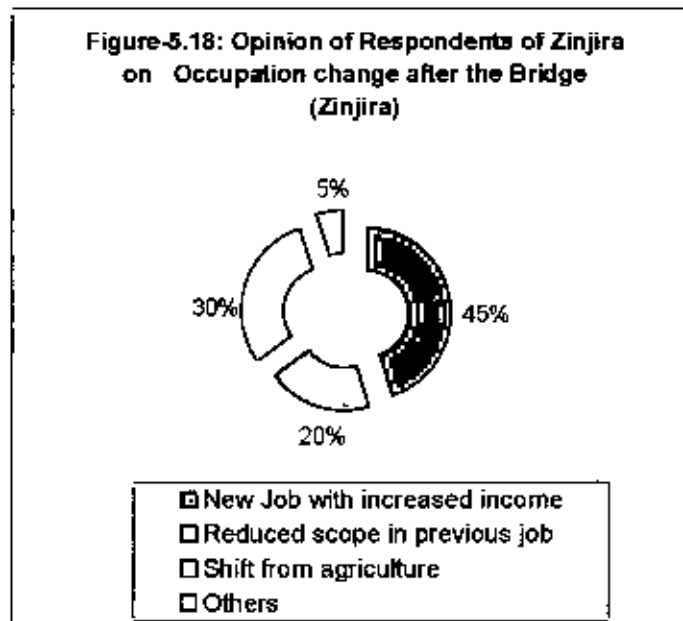
In 1991 the total number of household in Keraniganj was 94765, in 2007 it has increased to 1, 42,928. Data received from field survey states that, increased employment opportunity in trade and commerce has created much impact on agriculture based employment. In 1991, where 60 percent of people were engaged in agricultural sector, in 2007, it has reduced to 35.45 percent. Again, the second major employment was business in 1991 and 19,152 households were engaged in this sector. But in 2008, it has increased up to 50,170 nos. As new trend of business and industrialization has ensured income for workers, many people from different parts of the country have come here and joined as workers in these sectors. Rapid commutation has increased the scope for new trend of industries. It has increased the ratio of people engaged in this sector which has shifted from agriculture and related sectors. This changing scenario depicts that the 2nd Buriganga Bridge and the changing pattern of urbanization is playing a major role for changing trend of occupation in Keraniganj.



Source: Field Survey and Keraniganj Upazila Parishad, 2008

Figure-5.16 and Figure-5.17 show changing trend of occupation in Zinjira and Atasur areas after the opening of Bridge. It shows that, major change in occupation pattern is

viewed Zinjira. Here, significant shifting has been occurred from agriculture to business. It is assumed that, this trend will remain same as new industries and businesses are going towards to utilize the opportunity of that area when improved road communication has accelerated the whole process. But, no significant change is visible in Atasur area.

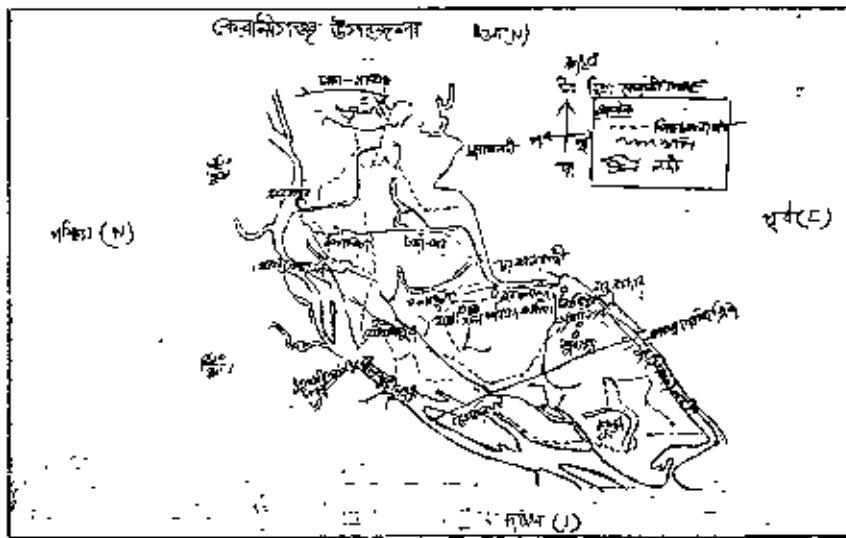


Source: Questionnaire Survey, 2008

Again, Figure-5.18 shows opinion of those respondents who changed their occupation after the opening of the bridge in 2001. Most of these respondents told that, new job or business with increased income opportunities pulled them to shift from previous occupation. Joblessness in previous occupation pulled another group of respondents to transform in another profession, i.e. day laborers in Badamtol ghat fall under this category. Again, some of the agricultural workers have shifted their jobs due to less opportunity in this field.

5.4.1 Flood and Flood Protection Embankment:

Keraniganj Upazila is surrounded by water bodies. The Buriganga River has passed through its southeast side, in North West side there is the Dhaleswari and the Kaliganga is in the west



Map-5.8: Rivers Surrounding Keraniganj Upazila
(Agricultural Section, Keraniganj Upazila Parishad)

The Greater Dhaka Flood Protection Embankment extends from Mirpur to Kellar More of Old Dhaka. The existing *Beribandh* has expanded from Mitford to Zinjira. Keraniganj Upazila is surrounded by river in three sides, so protection work is required in all sides of the Upazila to make it flood free. This requires bulk investment and such measure has not been taken yet as it needs huge cost and still Keraniganj does not bear such economic importance like Dhaka city. Map-5.8 shows the rivers surrounding the Upazila.

5.4.2 Existing Status of Flood Vulnerability

Normal land elevation of the area is lower than the surrounding area (Ahmad, 1993). In each monsoon when the rivers spill over, water spreads to the low lying areas. Besides, natural drainage system of the area has been deteriorated due to haphazard land filling by developers. So water becomes stagnant in the rainy season. Another reason is the construction and development of roads without considering the flood issues. Major roads of the Upazila have been elevated three feet high in recent times and some new roads are being constructed (Keraniganj Upazila Parishad, 2008). These roads have blocked the natural flow of water causing water stagnation. In the rainy season country boat becomes the major way of communication within the area. In previous years, about 80% people of

Keraniganj were affected in each flood. In normal flood, low lying areas become submerged under 5 to 6 feet water. In medium flood, water comes to house level. Table-5.4.1 shows flood level of Keraniganj in recent years.

Table-5.4.1: Flood Level of Keraniganj Upazila in Last Years

Year	Flood Level
1988	10'-12'
1998	8'-9' (With longest duration)
2000	5'-6'
2004	7'-8'
2007	6'-7'
2008	8'-9'

Source: Questionnaire Survey 2008

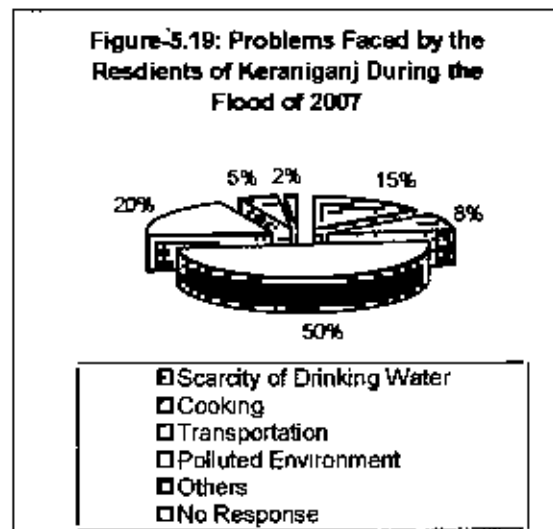


Figure-5.19 shows different hazards faced the inhabitants in the flood of 2007. In most of the cases, inhabitants faced transportation hazard. Environmental pollution and scarcity of drinking water were also acute. Map-5.9 shows land level of the study area in 2000. As 60% of the area is being used for agriculture, damage to farmers and crops is very acute for regular floods in Keraniganj. After the floods of last years, rehabilitation works were conducted by the government bodies to mitigate the sufferings of people

5.4.3 Status of Flood Vulnerability: Experimental and Reference Area

The experimental area, Zinjira falls under low flood prone area whereas the reference area, Atasur falls under highly flood prone zone. During the flood of 1988, the whole area of Atasur was under 10'-12' water. This caused severe suffering to the people and damage of properties. After the flood, residents of Atasur raised the level of their village high by land filling. Now the village is flood free but in monsoon it becomes detached from the other areas. Because in each monsoon, surrounding low lands of the village goes under 7'-8' water. So from Mid June to September, they have to move using country boats. This is a major obstacle for the development of the *monza*.





Photo-5.25: Students of Aganagar-Zinjira Govt. Primary School is coming school by using country boat during the severe flood of 2007 (The Daily Ittefaq, 14 July 2007)



Photo-5.26 A flood victim returning home with relief on at Suvadda union of Keraniganj (The Daily Ittefaq, 9 August, 2007)

5.4.4 Environmental Pollution

Air Pollution: Air pollution in Zinjira area is increasing day by day. There are two main causes behind this, air pollution due to congestion on the 2nd Buriganga Bridge in Babu Bazar area. Another reason is the dumping of solid wastes in the low lands of the unions. Absence of central waste collection system has accelerated this phenomenon. Besides, there are about 150 brick fields in Keraniganj (DDC, 2008). Many of these do not have 100 feet chimney which is a prerequisite of environmental friendly production (DoE, 2008). Brickfields are a major source of air pollution which creates fumes and demolish greenery for fuel consumption.

Pollution of Water Bodies: There is no public water supply facility in Keraniganj Upazila. Water bodies in and around the study area are so polluted that no one uses river water for any domestic purpose in the dry season. The canals are also polluted due to garbage disposal, waste water from factories and sewerage disposal by some irresponsible households. Public health is at a vulnerable condition due to polluted water.

Pollution of the Buriganga River: A recent study shows that there are 27 points surrounding the Buriganga which are polluting the river. Four of those points are Zinjira, Kaliganj, Mirerbagh and Hasnabad of Keraniganj (DoE, 2008). The dyeing units, dockyard and washing of clothes in laundries are causing this pollution. From long years back, hundreds of laundries have been using the river as water source. Other sources of pollution are the dyeing units of Pagla, Fatullah, Narayanganj and the tanneries of Lalbagh, Kamrangirchar and Hajaribagh. Besides these known sources, there are other sources, i.e disposal of wastes from ships, disposal of untreated waste from many dyeing

factories, pollution from the launch repairing dockyard and a large number of industries, sewerage line connection of some irresponsible households from Keraniganj and other area and indiscriminate use of open latrines

All these activities have made the water body highly polluted. The water color has turned to black and spreads germs and odor. This polluted water is spread to 27 kms of water body surrounding Dhaka city, i.e from Zinjira to Hazratpur, Kalatia and Fatullah area. Here, level of Dissolved Oxygen (DO) is zero. It has badly affected the livelihood pattern of fishermen at Zinjira area. A neighborhood of fishermen was developed here which is changing its characteristics. Fishermen are not getting a single fish from Buriganga even after trying for 7-8 hours. So they are changing their occupation (The Daily Itterfaq, 30 May, 2006).

5.4.5 Shore Line Protection Act, 1960 and River Encroachment

Bangladesh Inland Water Transportation Authority (BIWTA) has declared the Shore Line Protection Act, 1960 to protect navigation facility of rivers. Under this act, BIWTA has declared their ownership up to that part of land where the highest water level touches. After the establishment of Dhaka River Port, BIWTA declared their ownership on the 34 kms of shore land along the bank of the Buriganga which includes 451 acres of area. (BIWTA, 2008). This initiative was taken to maintain the navigation facility of the erected developed illegal structures. The decreased depth and water level of river have changed the direction of river flow. BIWTA is doing very little with the Act of 1960 to wipe out the land grabbers. Because they did not correct the government land records and maps. According to records, previous owners are still the authorized persons for those lands. Besides, lack of proper legislative measures and enforcement of laws against the influential land grabbers are obstacles for protecting the river and the navigability.

5.4.6 Status of Ponds, Ditches and Canals

To prepare the Detail Area Plan for Keraniganj area, RAJUK conducted a survey in 2000. According to that survey, Keraniganj Upazila had about 120.42 acres of pond, 151.46 acres of ditches and 50.87 acres of canal. Total area under these three categories of water body was 322.75 acres. Average depth of the major canals in monsoon season was about 3 meters. These canals performed a major role in the natural drainage facilities of the areas.

But by 2008, most of the ditches and ponds were already filled up in Agangar-Zinjira area. There were 7-8 canals in Keraniganj area. Many of the canals were connected with the peripheral water ways, which have either been closed or disconnected through encroachment and rising embankment or other interventions. As a result, the navigation system is being hampered and a large number of people are unemployed. Presently there

are only 2/3 canals in Keraniganj and condition of those are remarkably bad. Recent status of Bunganga-Mirerbagh canal and Zinjira-Syedpur (Zinjira Canal) canals is given below:

A. Zinjira Syedpur Khal (Zinjira Canal):

Encroachment of river and government land is a result of increased land pricing effect specially after the opening of the 2nd Buriganga bridge. As a part of this consequence, Already three fourths of the canal is occupied by the land grabbers and waste disposal by the local community. A developer namely “Karinganj Housing” has already encroached several kilometers of this historical canal taking support from local influential people. For this land filling, the opening of the major culvert on this road is already blocked. So water congestion is occurring here and in the next monsoon, thousands of people in the area will face water stagnation. Besides this, acute problem will arise in the agricultural sector of the area as from many years: water of this canal was being used for irrigation of the area.



Photo-5.27. Zinjira Canal has lost original its width & depth due to illegal encroachment (The Daily Ittefaq, 8 November, 2006)

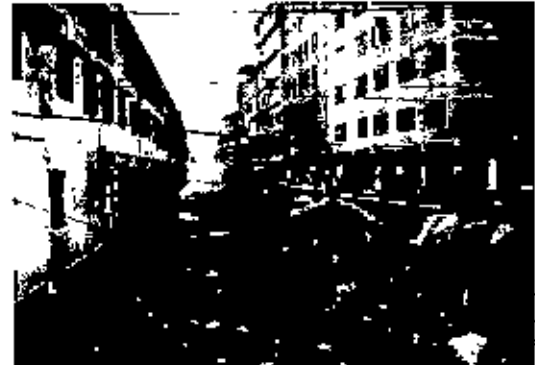


Photo-5.28: Dumping in Kaliganga Khal in Aganagar-Zinjira Market (Field Survey, 2008)

B. Suvadda Canal: Suvadda canal is about 10 kms long and it is connected to the Buriganga. The historical canal has a significant impact on the internal drainage system of Keraniganj. About 8-10 years ago, big boats from different districts of the southern part of the country including Faridpur, Khulna, Gopalganj, Nababganj came to Keraniganj and Dhaka using this canal. Even for the internal communication of the Upazila, importance of this canal was enormous. About 2 lakh people of Shuvadiya, Aganagar, Kalindi and Teghoria unions of Keraniganj are dependent on this canal. During the field survey of December, 2007, it was found that, Zila Parishad market had been constructed on a part of this canal. Dumping of solid waste by the dwellers and garments waste from the factories clogged the canal. This historical canal became a health risk for 2 lakh people. Considering the importance of this canal, BIWTA and relevant authorities decided to excavate and re-use this ‘Dead’ canal. Accordingly, with the help of joint law enforcing

agencies, all illegal settlements were removed and the canal was formally re-opened for general use on 16 June, 2008.

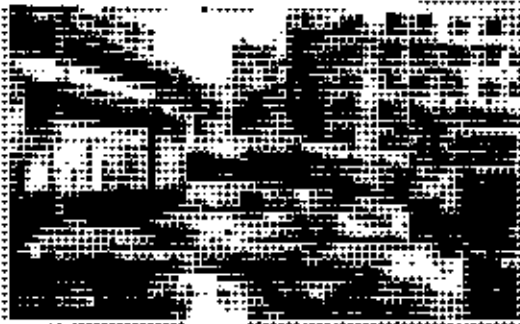


Photo-5.29: The Historical Suvadda Canal was unfit long time (The Daily Prothom Alo, August 30,2006)



Photo-5.30: Suvadda canal is being used again after excavation (The Daily Prothom Alo, June 17, 2008)

C. Atir Khal: Atir Khal is located at Kholamora, Waspur of Keraniganj where it meets the Burganga again in the north through important trading centres of Looter Char, Ghater Char, Emargaon, Joynagar, Atir Bazar, Panchdona, and Balurchar. Defying the wetland protection act, a real estate developer has embarked on a project to fill up Atir Khal, one of the busiest canals till today, connected with the river Burganga, and serving thousands of farmers, traders, and commuters of at least a dozen places of Keraniganj. In addition to the threat from the real estate developer, another big challenge Atir Khal faces is also at Waspur end, where a brick kiln owner built a road across the canal, totally blocking its passage.

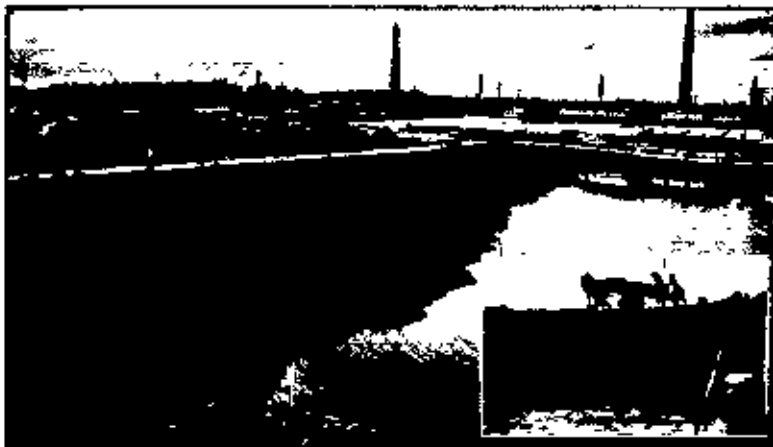


Photo-5.31: A brick kiln owner has built this road across Atir Khal (canal) at Waspur in Basila, Kholamora of Keraniganj and completely blocked the channel (The Daily Star, June 8, 2009)

Chapter 6: Potentials & Constraints for the Development of the Area

There are several constraints and opportunities against planned urban growth of Keraniganj Upazila. Among a large number of opportunities and constraints, some have been presented here:

6.1 Potentials of the Area:

6.1.1 Opportunities of the area from Planning Point of view:

The Structure Plan has identified the area as very potential for future urbanization and removing load from central Dhaka. It assumed that, construction of the second Buriganga bridge would provide direct access to the central part of Dhaka, which would make Zinjira more attractive for settlement to low and middle income people. Due to improved connections with central Dhaka, some of the activities of Dhaka might shift to Zinjira which would strengthen its economic base.” All the above predictions have proved successfully for Keraniganj area and now it’s being treated one of the lucrative area for the developers and commercial establishments near Dhaka

6.1.2 Easy communication with Capital City: The 1st and 2nd Buriganga bridges have created easy road communication between Dhaka city and Keraniganj thana. This communication and proximity of Dhaka city are the opportunities of Keraniganj which can be used properly.

6.1.3 Service Zone for Dhaka City: Keraniganj is playing an important role for supplying of agricultural commodities to Dhaka City. About 60% land of the area is agricultural. Hazratpur, Ruhitpur unions of Keraniganj Upazila are well reputed for vegetable production along with some other crops. After the construction of 2nd Buriganga Bridge, now vegetables are being transported to Dhaka city within 15 Minutes from Keraniganj. This has generated employment opportunities for thousands of people.

Again, Keraniganj is acting as a water supply zone for Dhaka city. Residents of different parts of old Dhaka are depending on the water carried from Keraniganj as water scarcity is very high there. People living in Gulistan, Siddiquebazar, Bongshal, Mitford, Chawkbazar, Nayabazar, Sadarghat, Nawabpur, Sutrapur, Dholaikhal, Gendarta of old Dhaka are largely depended on water carried from Keraniganj area. This area is facing about 2 crore liters of water shortage and in dry season this shortage becomes higher

(Zone-2, Dhaka WASA, 2007). The 2nd Buriganga Bridge is being used for this water transportation and serving Dhaka.



Photo-6.1: Potable water collecting from deep tube well of Keraniganj are being carried to sell in old Dhaka (Source: The Daily Prothom Alo, 11 June, 2007)



Photo-6.2: One Garments worker is drying cloths under sun in Aganagar, Keraniganj before Eid & Puja Festival of End 2007 (Source: The Daily Prothom Alo, 20 September, 2007)

6.1.4 Potential Area for Planned Commercialization: Several thousands of small garment production units are located in south Keraniganj. Before festivals like Eid and Puja, these production units become very busy and it is assumed that more than 50% of the local market demand is met by these units. Some of the garment production units export to some European countries as well. But this production centre has not developed in an organized way. Besides, many of the small business have shifted to Keraniganj area from old Dhaka i.e. seat of Rickshaw/Bi-Cycle making etc. If proper initiatives can be taken for planned commercialization of the area, it would generate employment for a large number people and earn revenue for the national economy as well.

6.1.5 Potential Area for Residential Development: Low living cost and easy communication with Dhaka has attracted the lower and middle class people for accommodation in Keraniganj. Again, land price is still much lower in Keraniganj compare to the adjacent areas like Dhaka, Narayanganj, Savar, Ashulia and Gazipur. If the area could be developed in a planned residential area, it would certainly reduce pressure on Dhaka city.

6.1.6 Tourist Attraction to the Historical Buildings: A large number of historical buildings are located in the study area. These buildings may be a component of tourism development in Keraniganj. The Zinjira Palace is one of such heritage building.

6.2 Constraints of Development

6.2.1 Proximity to Major Urban Agglomeration: Due to the close relation with Dhaka city, the area is dependent on Dhaka city for important functions, i.e. health, education, urban services etc functions in the area with comparable standards. This is a constraint for the developing separate quality services and facilities in the area

6.2.2 Development Problems on Low Lands: About 5 to 10-meter earth filling will be needed specially for industrial and commercial development in the study area (DDC, 2003). So, bulk development should not be encouraged due to this huge cost involvement. Poor soil condition is another problem of bulk development.

6.2.3 High Flood Vulnerability: The structure plan has identified the area as one of the highly flood vulnerable areas of the country. Due to the low natural topography and surrounding rivers, three fourths of the area is inundated by flood each year. No significant flood protection measure has been taken so far to protect the locality. This is a major barrier to the development of heavy industrial and commercial establishment.

6.2.4 Mental Barrier of People for Declaring Municipal Authority: Many people specially the old settlers want to keep the area under the existing Upazila authority. Because, if it is declared as separate municipality or included in DCC, tax burden will be increased. This creates an obstacle for improved status of the area

6.2.5 Absence of Infrastructural Facilities and Urban Services: Lack of proper infrastructure facilities including access roads, central water supply, solid waste disposal and drainage system are hampering urbanization process of the area. It gets second priority for getting electricity supply during load management. The industrial units specially the re-rolling mills, still mills are seriously affected by power crisis. Except the Zanjira ferry *ghat* to Upazila Paishad road; all roads in Keraniganj are narrow and irregular which become submerged in the rainy season. Infrastructural facilities such as water and sanitation will not be possible to establish in these narrow roads. Apart from this, the area is seriously affected by the lack of supply water. In dry season when water level goes down, people specially the rural based settlements have to face serious problems. They have to come even miles to collect potable water. This also hampers irrigation. Therefore, river, canal and low lands are used as garbage disposal ground which is polluting the environment.

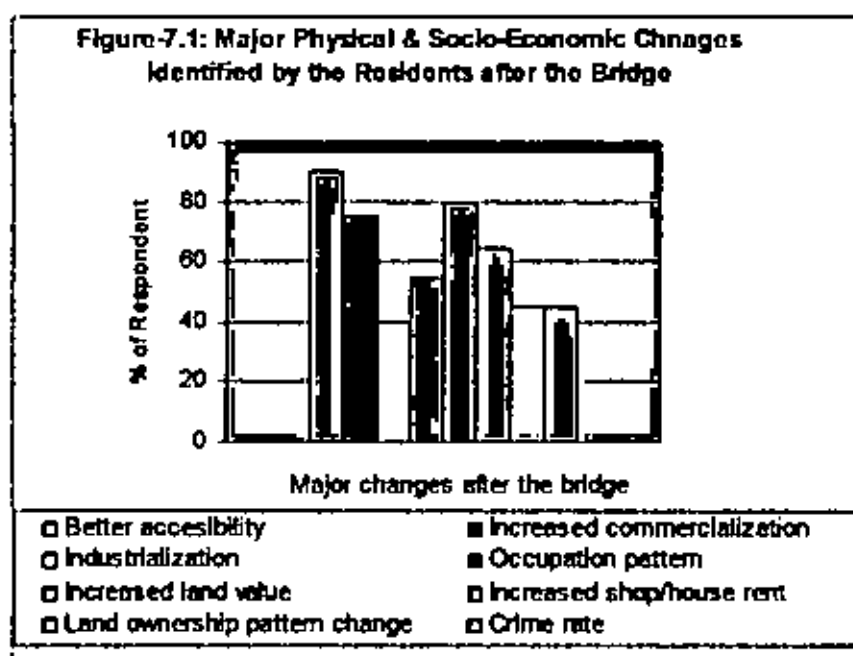


Photo-6.3: Two children carrying water from a source in Keraniganj in mid summer of 2008 to meet their household demand (Source: The Daily Prothom Alo, 29 May, 2007)

6.2.6 Lack of Strict Regulatory Measures and Landuse Planning: Low lands are being filled up in the area by land developers without considering the natural drainage system which is increasing water stagnation and flood vulnerability. No zoning regulations are being maintained for development of multistoried residential buildings and noxious small and medium industries. Due to lack of proper regulatory measures, Keraniganj is going to be a clumsy unplanned slum like different parts of old Dhaka.

6.2.7 Lack of Proper Campaign: Many of the local influential people think that Keraniganj is lagging behind due to lack of proper campaign. Most people do not have clear idea about the close distance between Keraniganj and Dhaka. It is commonly believed that Keraniganj is a locality of manufacture of adulterate goods specially cosmetics and spices. And improved communication between Keraniganj and other parts of the country is not properly disseminated to the concerned bodies yet. Fear about high flood vulnerability is hampering the high valued residential and industrial development here.

The study resembles that, there are significant changes in the physical, social and economic condition in Keraniganj area after 2001. The 2nd Huriganga bridge was opened in this year which has brought a spate of rapid development in the whole area. Physical impact is mostly visible in the areas adjacent to the bridge and approach roads. Social impact is widened in most of the corners of the locality. Increased educational and employment opportunities have changed the socio-economic status of the whole area. Livelihood pattern of residents is also improved.



Source: Questionnaire Survey, 2008

Figure-7.1 shows major changes identified by the residents of Keraniganj that came after the bridge. It shows that, most of them think that, improved accessibility with Dhaka and all over the country is the most significant impact of the bridge. This opportunity has accelerated other changes. To use this scope, new trade and investment opportunities came into Keraniganj. As a chain effect, land value increased in a high rate. New employment opportunities and increased income have ensured better affordability of the people. In consequence, business centers, shopping malls are growing in a remarkable pace. Increased shop rent and house rents have been identified as another major change by the residents. Respondents also identified the improved situation in law and order situation in recent years as a consequent effect of the bridge. They think increased employment opportunities are pulling anti-socials to return in a normal life. The residents

also identified the new business coming with business as another major impact of the bridge. Residents of Keraniganj feel that, people of old Dhaka have a social bondage with them. So, many of them are coming here shifting business from old Dhaka.

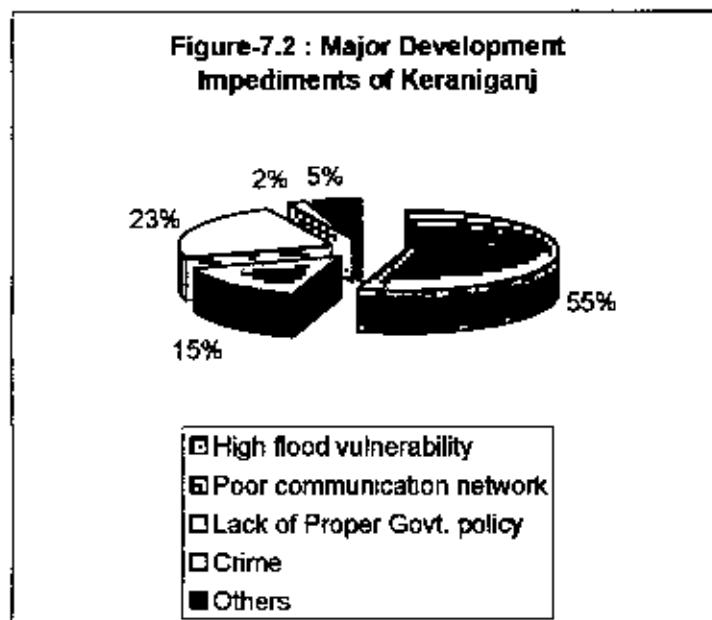
During questionnaire survey, final comment of the Keraniganj residents was that, all these changes are resulting effect of improved accessibility after the bridge which should be guided properly. The bridge has opened immense potential for them, so their demand is to draw attention of relevant corner for supporting this drive.

Impact of the Approach Roads on the Adjacent Areas: The experimental area Zinjira was much developed than the reference Atatur from very first. This gap became more visible when the 2nd bridge was constructed through the Zinjira union. An important finding came into out when the reference area was compared with some other similar areas. Significant change is visible in those areas like Chunkutiya, Brahmankirta *mouzas* which were at the similar stage like Atatur before bridge. Approach roads of the bridge have passed through these areas which has accelerated the high increase of land value. New trade centers, business houses, industries and other economic development have occurred there within few years to meet local demand. So, a significant change is found in these parts which were treated as remote parts of Keraniganj like Atatur. But similar development is absent in Atatur as it is far from the bridge or the approach roads.

Gateway for Vehicles Coming from South Bengal: Another important finding of the study is that, the bridge can be a greater scope for connecting south Bengal to Dhaka through Dhaka-Mawa highway. Presently, the vehicles/passengers coming from south use Jatrabari Bus Stand (through Zurain) for entering Dhaka. It creates excessive load of the terminal and a traffic jam at an entry point of Dhaka. Presently, Jatrabari terminal is being used by all vehicles coming from Chittagong and Sylhet division. Part of Dhaka Division, i.e. Narayanganj, Norshingdi is also using it. The route is so overloaded to service the present capacity that intensive traffic jam is a common phenomenon there. Construction of the Padma Bridge is under processing now. It will create further load on Jatrabari Bus terminal and the following roads to enter Dhaka. If the access roads of 2nd Buruganga Bridge can be widened and good connectivity is ensured, then the vehicles from south Bengal can enter Dhaka using Keraniganj-Lalbagh route avoiding Jatrabari. Again, the road from Ashulia to Narayanganj alongside river bank, which is under construction now, can be connected with this bridge. This will not only help for avoiding traffic jam but also a communication network with grater Dhaka to all over the country.

Major Barriers for the Development of the Study Area: Essential civic amenities and urban facilities are unavailable in the study area. The area is flooded every year to varying depths. Problem of water logging is very acute. Infrastructural development here is still in primary stage. Except few septic tanks individually provided by some well-to-do households, there is unhygienic way of disposal of solid waste. Piped water is limited by few community rural tube wells provided by DPHE or installed on private basis.

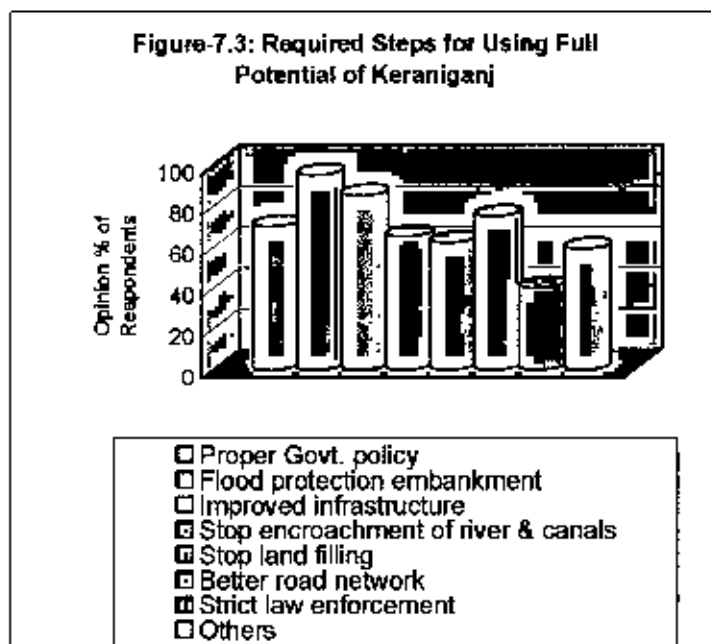
Opinion of Respondents for the Development of Keraniganj: A questionnaire survey was conducted among the residents of Keraniganj area to collect their opinion regarding existing constraints and required steps for future development of the area



Source: Questionnaire survey, 2008

Figure-7.2 and Figure-7.3 highlight opinion of residents on major barriers for the development of the Keraniganj and required steps for overcoming this. Here, high flood vulnerability has been identified as major barrier for the development of the area. New investment in trade, commerce and industrialization is hampering due to high threat of flood. Again, lack of proper government policy has been marked as another barrier. Keraniganj is lagging behind many urban services and facilities. Respondents think if government takes proper policy for bringing the area under DCC or declare it as a separate municipality; the situation would improve certainly. Again, another opinion came for improvement of infrastructure facilities specially the secondary and access roads. They think, though the 2nd Buriganga Bridge has improved accessibility with Dhaka and all over the country, internal road network and other infrastructural facilities are not up to

mark. So, this are should be properly addressed. Some people marked the necessity of a stopping haphazard land filling which is threatening the area for further environmental degradation.



Source: Questionnaire survey, 2008

A major part of the residents think that, Keraniganj is not well portrayed to the concerned people Target groups, who can select Keraniganj for future investment or residential development, are not informed properly. They have no idea that Keraniganj is so near to Dhaka city and 2nd Buriganga Bridge has ensured an excellent communication between the areas. This group of residents thinks that, proper awareness raising initiatives should be taken for highlighting the potential of Keraniganj for a planned residential area with full urban facilities which can reduce the pressure on Dhaka city

Chapter 8: Recommendation

The study focuses that, Keraniganj has high potential considering its economic importance and locational advantage. After the construction of 2nd Buriganga Bridge, this potential has increased a lot. But as development is not guided, so unplanned urbanization is demolishing the potential of the area. Several steps should be taken for stopping the unplanned urbanization in the Upazila. The required steps are of two types, short term & long term.

8.1 Short Term Plans:

8.1.1 Improvement of Circulation System: A remarkable barrier for the development of the upazila is the poor accessibility within the unions. So, widening of some major roads and new construction of pedestrian, vehicular road connecting with embankment are urgently needed. If the circulation system is developed, the entire area will be developed very rapidly which will increase the socio cultural and economic activity with Dhaka city and thus the surrounding community could be greatly improved. If this could be done, it would help for the over all development of the area.

8.1.2 Protecting Low Lands: Immediate steps should be taken to protect the low lands and canals from the land grabbers and housing developers.

8.1.3 Reduction of Traffic Jam: Steps should be taken seriously to resolve traffic jam on bridge and approach road as it's acting as hindrance for using full potentiality of Babubazar and Keraniganj area.

8.1.4 Improved Law & Order Condition: Existing law and order situation of Keraniganj area should be improved more. Law enforcing agencies should strengthen their activities specially in Aganagar, 2nd Buriganga Bridge and river ghat areas.

8.2 Long Term Plans:

8.2.1 Declaration of the Area as a Separate Municipality: Considering the high potential and development trend, Keraniganj area should be given municipal status or be included within Dhaka City Corporation. But as Dhaka City is expanding in fringe areas and density is already at extreme condition. Accordingly, provision of urban facilities and services are already beyond the capacity of DCC. So, declaration of separate municipality would be better solution for Keraniganj area which will improve the infrastructure, utility and other services of Keraniganj which are urgently needed for commercial and industrial development of the area. Structure Plan also suggests accordingly.

8.2.2 Integrated Planning for Flood Protection: According to DMDP, “The structure plan has prioritized the flood protection works in line with the Strategic Options Report and the reasoning therein SPZ 8, Zinjira (especially when linked with old city by the new bridge) will see strong development pressure and will grow faster than Narayanganj and Narayanganj West (SPZ 10 and 9) irrespective of it being considered strategically undesirable.” Accordingly integrated planning for flood protection of the entire Keraniganj area is strongly recommended for using the full potentiality of the Upazila. To implement a specialized committee can be formed to find out the best solution and implement it immediately

8.2.3 Landuse Planning and Strict Regulatory Measures: Disorderly development and unplanned urbanization are viewed in all over the Keraniganj which should be controlled through strict regulatory measures. The Detail Area Plan of RAJUK is a guideline for the area on the development and control of development trend in a systematic manner. As a sub flood flow zone the area has been recommended for development maintaining original characteristics. Greenery, play field, stadium, graveyard, low height residential developments are the encouraged land uses here. Most of the area is marshy and its soil formation is yet to be completed. Northern part of the area is a part of Dhaleswari river where soil condition is not good at all. Soil condition is comparatively better in southern part but due to environmental consideration, structure plan doesn't permit here to build tall structure, heavy industry, high rise buildings. The area is located within high flood vulnerable zone About 5-10 meter earth filling is required for most of the development activities (Khan, 1991). So, huge cost involvement is another reason for discouraging bulk development here.

Agricultural Zone: The study reveals that about 60% of the total area is in agricultural use (Ahmad, 1993) The area is acting as a service zone for Dhaka city specially for supplying of crops and vegetables. But after the construction of 2nd Buriganga Bridge, development activities are reducing the agriculture land rapidly. The Detail Area Plan of RAJUK considers a rural based development for Keraniganj. So, part of the study area should be controlled with rural character. 'Development Control' should be imposed on the area to preserve the agricultural land.

Residential Zone: A large number of pucca buildings have been constructed in the study area with the violation of setback rule. It will be not ideal to demolish all of these buildings. But any renovation and alternation should be guided according to the Building

Construction Act. Keraniganj is located on the extreme south of Dhaka City. So high-rise construction (above 6 storied) should not be permitted within one k.m. from the riverbank of Buriganga. Separate housing zone for garments worker and lower middle class people can be developed here. Low interest loan and other incentives can be provided for lower and middle income group to build housing in Keraniganj. This will reduce the pressure on Dhaka city. Garments worker and day laborers staying in unhygienic slums in central part of capital city and Keraniganj can be rehabilitated here through low cost housing in a separate housing zone. Private housings should be developed according to the objective of Detail Area Plan. Private housing estates are recommended to develop following 'Garden City' concept.

Industrial Zone: Zinjira and Kaliganj area should be encouraged for commercial and light industrial use, i.e. garments, shoe making. Any type of heavy or noxious industry, dockyard, mechanical workshop which causes remarkable source of water, air and noise pollution will be strictly prohibited. Keraniganj is located in southern side of Dhaka city, so if heavy industry is constructed here, all smoke, dust, and polluted air will be blown towards Dhaka City through natural wind direction. For example, in Mexico City, natural wind direction is barred by hills. Different types of heavy industries are located here which produces pollutants including CO₂, CO. There are some pocket areas in Mexico where these noxious gases exist in a very high level which causes suffocation and death of living bodies. Temperature of Dhaka city is already high because of brickfields in fringe areas etc and construction of heavy industry in Keraniganj area will deteriorate the situation further. Again, soil condition of Keraniganj still doesn't permit construction of heavy industry. Most of the existing heavy industries had been developed through illegal political influence and didn't take proper permission from regulatory body.

New industrial establishment on the river bank of Buriganga should be discouraged through the imposition of heavy taxes. Minimum taxes may be imposed on the economic activities if established in the areas prescribed in the plan. The government may deliver different types of subsidies to the private entrepreneurs for relocating existing industrial establishment from river bank.

Commercial Zone: Mixed uses specially economic activity and residential establishment are in the same premise are common scenario specially in Zinjira, Aganagar area. These activities should not be disturbed if the land holding is by private owners. Further arrangement on economic activities including industrial establishment should be provided separately according to the type of economic activities. Garments and related economic

activities are potential business in Keraniganj. New Garments production centers should be developed in a planned way by establishing a separate 'Garments Village'. Renovation of existing garments factories with proper working environment (light, ventilation, fire safety) is highly recommended. Every whole sale markets and garments production centers should develop their own warehouse and separate space for loading/unloading as presently these are being conducted on roads which is a source of traffic jam.

8.2.4 Improvement of Urban Services and Facilities: Improvement of infrastructure and urban services like water supply, gas, telephone, drainage system, waste disposal, sanitation are at very poor condition. Construction of 2nd Bridge has accelerated the development of posh residential areas, different types of commercial and industrial activities. To facilitate the existing set ups and encourage new developments, all these facilities have to be ensured on an urgent basis. Widening of existing roads, construction of new access roads in each wards and well organized service system should be arranged as soon as possible. Educational institutions and health facilities should be increased. Because, improved communication with greater Dhaka has increased population density in Keraniganj which has created demand for additional facilities.

8.2.4 Improvement of Electricity Supply: Presently like most other parts of the country, Keraniganj is facing acute power problem. Hundreds of industrial units are located in Keraniganj which includes dockyard, melamine industry, shoe making factories, poultry farm, jute mill, re-rolling & steel mill, garments industry, furniture factories etc. Irrigation service and these factories are urgently required proper electrification facilities. If electricity demand is met properly, economic activities of Keraniganj will be flourished more.

8.2.5 Protection of Rivers and Canals: Protection of Buriganga is a must to protect the Dhaka city and also Keraniganj. So all types of activities which have the tendency to encroach the river bank, pollute the environment and confine the views of the river should be strictly prohibited. To control river pollution, strict regulatory enforcement is required. To upgrade from the existing polluted condition, the government can seek support from development partners and developed countries. The example of neighboring country, India to protect the Ganges could be followed here. The Indian government is taking support of 111 million dollar loan from Japan through Japan Bank of International Cooperation (JBIC) to make the Ganges pollution free (The Daily Ittefaq, 21 May, 2006).



Besides, river based tourism industry may be established on the proposed embankment. Existing industries should be discouraged and replaced by tourism industries by the public sector through government subsidies. The other adjacent river, Dhalesawari needs to keep pollution free as its acting major role for the natural drainage system and river based transportation system of the areas. Dredging facilities will be needed for the rivers. Low lands of Keraniganj may be fulfilling through these dredging activities in a planned way.

Buriganga River is to be redefined and the edges of both Zinjira canal and other canals have to be marked. The canals should be maintained and kept free from all types of development and pollution in Keraniganj. Otherwise, investment in flood protection will be offset by internal flooding within the protected areas. As the 2nd Buriganga bridge has accelerated the urbanization process and land value of Keraniganj Upazila, there is trend towards incremental land filling and development. So, steps should be taken for recovering and protecting the canals and other important low lands of the area.

8.2.6 Environmental Consideration: For a better living environment all of the environmental phenomenon, i.e. industrial waste, pit latrine, open drains towards rivers and canals, brick fields, dumping grounds should be considered with systematic planning principles and regulatory measures. Public awareness should be increased on the fair living environment. Ecological balance of the total area has to be maintained by proper plantation and maintaining green and open space.

8.2.7 Tourist Zone: All the historic buildings (i.e. Zinjira Palace) should be included under conservation and preservation program.

Chapter 9: Conclusion

The study is an attempt to find out potentialities and constraints for the development of Keraniganj area. During this course, special emphasis has been given to the changes after construction of the 2nd Buriganga Bridge. As an urban issue, this is an attempt to reach for the better option considering all the alternatives. The study may reflect the past constraints, present disorganized development and shape a new dream for the betterment of the area as it possesses high potentiality. If we go for the present usual approach for developing this area, we will lose this great opportunity. This is the high time to think for this area as it is too important at city's present context. Integrated development for the total area is urgently required as it will contribute to the local community and also for Dhaka city providing the option to reduce pressure on the capital. This is an opportunity to utilize the options to reshape the image of the area. This may indicate the ways to dream a new realm of life for Keraniganj-within the broader context of Dhaka city.

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Appendix-1

Questionnaires on Land use & Socio economic Changes of Keraniganj Area after the Construction of 2nd Buriganga Bridge

Questionnaire-1:

For Resident of **Zinjira-3** (Experimental Area-Adjacent to Bridge) and **Atasur** (Reference Area-Far from Bridge)

Name of the Student: Rumana Akhter

Student No: 040415015F

Thesis Title: A Study on Impact of the 2nd Bunganga Bridge on the Physical and Socio-Economic Condition of Keraniganj Upazila

Bangladesh University of Engineering & Technology (BUET)

April 08, 2006

Date:
 Location
 Union:
 Mouza.
 Signature of interviewer:

Sample No:

1. Profile of Respondent

(a) Name

(b) Age:

(c) Sex

Code: 1

Male

2 Female

(d) Occupation:

(e) Income level: (Tk/Month)

Code:

1 >3000

2 3000-5000

3 5000-10000

4 >10000

2. (a) Do you have any significant change in your income level after the construction of bridge?

Code

1 Yes

2 No

(b) If yes, please specify how it was related with bridge?.....

3. What are the main changes you see in your area after the construction of bridge?
 (Put tick ✓ mark in the box)

(a) Better accessibility with Dhaka & other part of country

(b) Increased rate of Commercialization

(c) Industrialization

(d) Change in occupational pattern (Go to Q no 4)

(e) Increase of land price (Go to Q. no.5)

(f) Increase of shop rent/house rent (Go to Q. no.6)

(g) Change in land ownership pattern (Go to Q. no.7)

(h) Crime rate & pattern (Go to Q no.11)

4. What are the changes in occupational pattern in your area after the bridge?

(i) New job creation in any specific field

(ii) Removal of previous Job

(iii) Agricultural labors are shifting to other occupation

(iv) Others (Please specify)

5. Land Price (Per *katha*)

(i)

Type of Land	Before the bridge (in 1999)	After the bridge (in 2006)
Residential		
Commercial		
Agricultural		

(ii) What are the main causes for changing of this price?

6. Shop Rent/House Rent (Per floor)

(i)

Type	Before the bridge (in 1999)	After the bridge (in 2006)
Shop Rent		
House Rent		

(ii) What are the main causes for changing of this rent?

7. Land Ownership

(a) Is there any change in land ownership pattern in your area: Code: 1 Yes
 2 No

(b) What are the main causes?

8. Migration & Related Information

(a) How many years you are staying here? Code. 1 ≤ 5 Years
 2 6-15 Years
 3 ≥15 Years
 4 Since Birth

(b) Where did you live before and after the bridge?

Before.....

After.....

(c) If you are a migrant what are the main causes for moving here?

(d) What is the status of the following facilities in your area?

Sl No	Type of Facility	Before Bridge	After Bridge	Remark (if any)
1	Road Network			
	Within the area			
	Connection with Greater Dhaka & Other Part of the country			
2	Gas			
3	Water Supply			
4	Electricity			
5	Solid Waste Management			
6	Drainage System			

7	Sanitation			
8	Educational Facilities			
9	Health Facilities			
10	Telephone			
11	Postal System			
12	Launch Ghat/Ferry Ghat			
13	Open Space			
14	Other Recreational Facilities			

Code: 1 Good 3 Poor
 2 Moderate 4 Non existent

9. Flood Situation

(a) Flood condition in your area in last years:

1 Severe
 2 Normal
 3 No Flood

Year	Code of Condition

(b) Causes of flood in your area (Put tick ✓ mark in the box)

- (i) No Flood protection embankment
- (ii) Naturally Low than the adjacent area
- (iii) Land filling
- (iv) Stagnant rain water
- (v) Others (Please Specify)

10. Environmental Condition

Component	Before Bridge	After Bridge	Status Code	Causes of change in pollution level
Air				
Water				
Noise				
Water body in and around the area				

Code: 1 Pollution increased at a significant level
 2 Pollution increased at a nominal level
 3 Unchanged

11. Change of Crime Rate and Pattern

Type of Crime	Before Bridge	After Bridge	Causes for change

Code 1 Increased
 2 Decreased
 3 Unchanged

12. Information on accommodation pattern of respondent

(a) Type of House

Before Bridge	After Bridge

Code

- 1 Pucca (Single Storied)
 2 Pucca (Multi Storied)
 3 Semi Pucca
 4 Kutcha
 5 Other

(b) Use of Building

Before Bridge	After Bridge

Code

- 1 Residential
 2 Commercial
 3 Industrial
 4 Mixed
 5 Other

13. (i) Provision of housing facilities in your area

Type of Housing	Status Code		Starting Year (If status code is 2)	Target Group (If status code is 2)
	Before Bridge	After Bridge		
Public				
Private				

Status Code: 1 Existent 2 Non-existent

(ii) Do you think bridge has increased provision of public and private housing in your area?

14. (a) Dhaka and Narayanganj are adjacent to Keraniganj and the 1st, 2nd bridge created direct connection with these cities. But there was no significant development in this area till now. As a resident of this area in your opinion what are the main causes behind this?

- (i) High vulnerability to flood
 - (ii) Poor communication network
 - (iii) Lack of proper Government policy
 - (iv) High rate of crime
 - (v) Others (Please specify)
-
-

15. In your opinion what should be the major steps to use the full potentiality of the area? (Please Put tick ✓ mark)

- (a) Proper Government Policy
 - (b) Flood Protection embankment
 - (c) Improvement of Infrastructure facilities
 - (d) Stop encroachment of river & other water bodies
 - (e) Stop land filling
 - (f) Better road network to improve existing transportation pattern
 - (g) Strict enforcement of law & order to reduce crime
 - (h) Others (Please specify)
-
-

Questionnaire-2:

Questionnaire for Commercial Centers of Zinjira-3 (Experimental Area-Adjacent to Bridge) and Atusur (Reference Area-Far from Bridge)

Sample No:

1. Profile of respondent:

(i) Name:

(ii) Age:

(iii) Sex

Code: 1

Male

2

Female

(iv) Occupation:

(v) Income level: (Tk/Month)

Code.

1 >3000

5 3000-5000

6 5000-10000

7 >10000

2. Information related to commercial centre

(a) Name of the organization:

(b) Year of establishment :

(c) Nature of Activity of your organization

Before Bridge	After Bridge	If it is changed after bridge what are the main causes for this?

Code:

1 Shopping Centre

2 Bank

3 Bazar/Hat

4 Factory

5 Service Organization

6 Residential

7 Other

(d) Location of your organization

Before Bridge	After Bridge	If location is changed after the bridge what are the main causes for doing this?

3. (i) If your organization stays here before the bridge, do you feel any significant change in the income level of it after the bridge construction?

Code: 1 Yes (go to Q. No 3 (ii))

2 No

(ii) What is the type of change and how it is related with bridge?

Type of Change	Put tick (✓) mark	Relation with Bridge
Increased		
Decreased		
Unchanged		

4. (i) Do you think a significant change in commercial activities occurred in your area due to bridge? Code: 1 Yes
2 No

(ii) What are the main changes?

.....
.....

5. What is the status of the following facilities in your area?

Sl No.	Type of Facility	Before Bridge	After Bridge	Remark (if any)
1	Road Network			
	Within the area			
	Connection with Greater Dhaka & Other Part of the country			
2	Gas			
3	Water Supply			
4	Electricity			
5	Solid Waste Management			
6	Drainage System			
7	Sanitation			
8	Educational Facilities			
9	Health Facilities			
10	Telephone			
11	Postal System			
12	Launch Ghat/Ferry Ghat			
13	Open Space			
14	Other Recreational Facilities			

Code: 1 Good 3 Poor
2 Moderate 4 Non existent

6. What can be the major steps that might create rapid improvement in the commercial activities of your area?

.....
.....
.....

Questionnaire-3:

Questionnaire for the Commercial Centers of Northern end of the bridge at Badamtoli Ghat, Babubazar, Old Dhaka

Sample No:

1. Profile of Interviewee

- (a) Name
- (b) Age
- (c) Sex Male
 Female
- (d) Occupation
 - (i) Whole seller
 - (ii) Retailer
 - (iii) Service holder
 - (iii) Transportation worker
 - (iv) Shopper
 - (v) Port worker
 - (vi) Other
- (e) Income level (Tk/Month)
 - (i) 0>3000
 - (ii) 3000-5000
 - (iii) 5000-10,000
 - (iv) >10,000
- (f) Is your occupation same before and after the bridge? Yes No
- (g) If you have changed occupation after the bridge then what are the main factors for doing this?

2. Information related to commercial centre

- (i) Name of the organization
- (ii) Year of establishment
- (iii) Nature of Commercial Activity
- (iv) Do you think a significant change in commercial activities occurred in your area due to bridge?

3. Wholesale Marketing

- (i) Do you think a significant change in whole sale marketing occurred in your area due to bridge?
- (ii) With which areas of the country you conduct trade?
- (iii) Do you think bridge has created a greater impact on the accessibility for wholesale marketing? How?

4. Congestion pattern

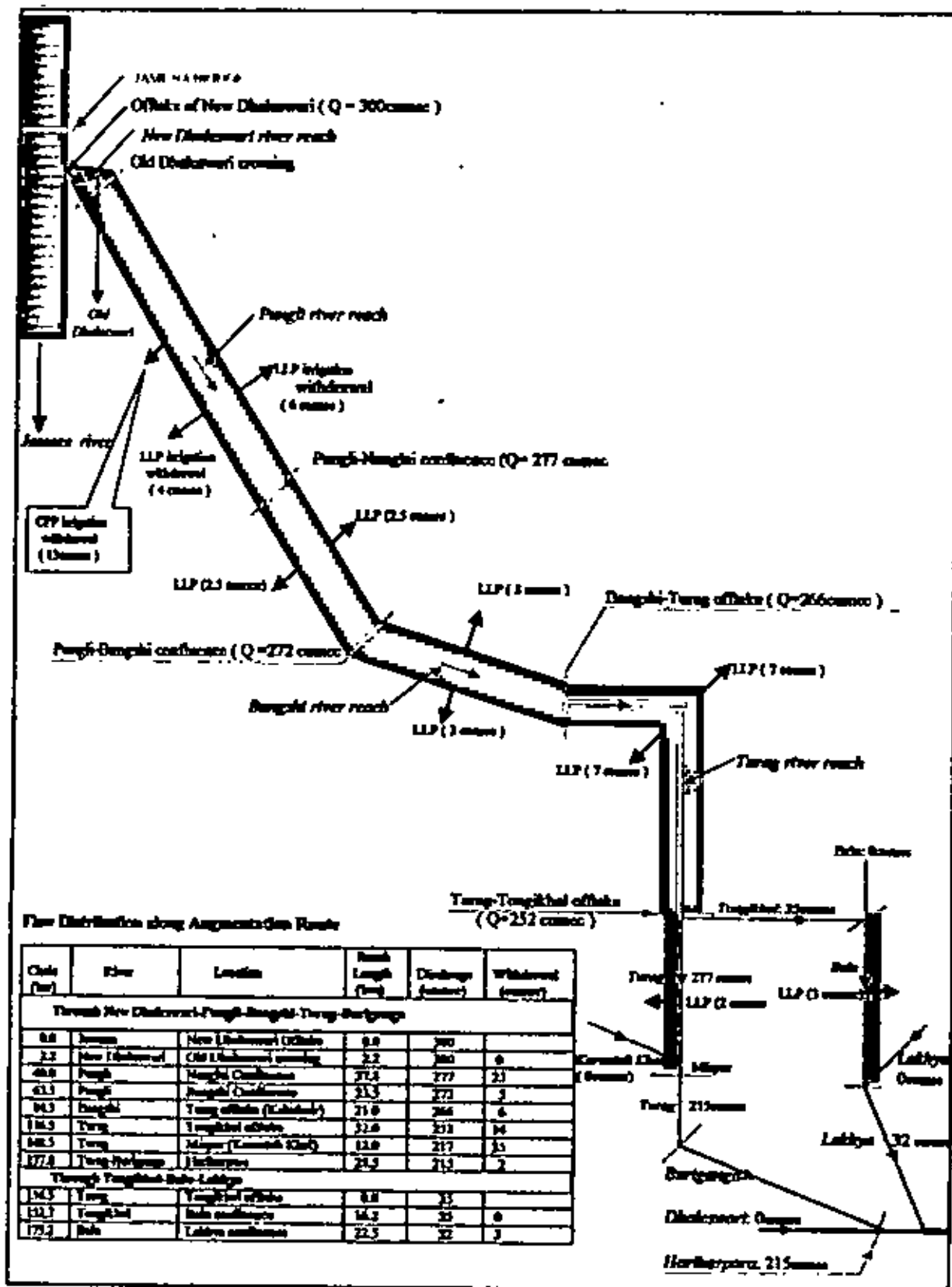
- (i) What is the congestion pattern in this area before and after the bridge?
- (ii) What is the impact of the congestion on your trade?
- (iii) Do you think bridge has reduced congestion and ensured better accessibility for more trade in this ghat?

Appendix-2: Trend of Changing Income Level of the Residents of Zinjira

Sl No.	Name & Occupation of Respondents	Previous Income (Tk)	Present Income (Tk)	Remark
1.	Hamid Mollah Rickshaw Puller Location: Zinjira	100 Tk/Day	200-250 Tk/Day	Transportation of goods over the bridge has increased a major part of the income.
2.	Abdullah Al Kafi Manager LG-Butterfly Sales Centre Zinjira Branch (Previously it was located in Aganagar Bazar, after the construction of bridge it has been shifted to the Zinjira alongside the approach road of bridge for better transportation of goods and more sales	5Lakh/Month	30Lakh/Month	Improved communication has made the transportation process of their sales item easier. Increased income has enhanced purchasing capacity of people which accelerated sales of goods.
3.	Golam Kibria Retail Manufacturer of Ready Made Garments Location: Aganagar Bazar	10,000 Tk/Month	20,000Tk/Month	After the construction of bridge, bulk sales have been increased Police Check Post is required near river <i>ghat</i> to avoid unnecessary harassment of goods delivery.

Sl No.	Name & Occupation of Respondents	Previous Income (Tk)	Present Income (Tk)	Remark
4.	Shakila Sultana Location: Imambari, Zinjira (Near Graveyard, adjacent to bridge) Owner of some rented house in Zinjira Area Duration of Stay: 20 years	Rent Per Month (With Utility) Semi-Pucca: Tk 500-600/Room Full Pucca: Tk 1000-1200/Room	Rent Per Month (With Utility): Semi-Pucca: Tk 1000/Room Full Pucca: Tk 1500/Room	Rent of house has increased a lot. Recent trend shows that as commercialization and trade are increasing day by day, mixed use is also increasing. In Aganagar-Zinjira area, owners are rented their houses more to commercial purposes than residential.
5.	Sekander Talukder Shop Owner Aganagar Bazar	Tk 10 Lakh/Possession	Tk 20 Lakh/Possession	Improved communication has accelerated commercialization
6.	Golam Saber Construction Material's Business. Year of Establishment: 1996 Location: Before Bridge-Nayabazar of Old Dhaka After Bridge-Aganagar, Adjacent to bridge road	Tk 5 Lakh/Month	Tk 20 Lakh/Month	Cause of Shifting to Keraniganj: After the bridge, now Keraniganj is a highly developing area. Land Developers and Housing Companies are coming. In Keraniganj area, 70-80 housing companies are working at this moment and even in Aganagar-Zinjira area there are 5-7 housing real estate agencies working. To meet this high demand, construction materials business in Keraniganj is booming.

Sl No.	Name & Occupation of Respondents	Previous Income (Tk)	Present Income (Tk)	Remark
7.	Shakila Sultana Location: Imambari, Zinjira (Near Graveyard, adjacent to bridge) Owner of some rented house in Zinjira Area Duration of Stay: 20 years	Rent Per Month (With Utility) Semi-Pucca: Tk 500-600/Room Full Pucca: Tk 1000-1200/Room	Rent Per Month (With Utility) Semi-Pucca: Tk 1000/Room Full Pucca: Tk 1500/Room	Rent of house has increased a lot. Recent trend shows that as commercialization and trade are increasing day by day, mixed use is also increasing. In Aganagar-Zinjira area, owners are rented their houses more to commercial purposes than residential.
8.	Sekander Tahukder Shop Owner Aganagar Bazar	Tk 10 Lakh/Possession	Tk 20 Lakh/Possession	Improved communication has accelerated commercialization
9.	Golam Saber Construction Material's Business. Year of Establishment: 1996 Location: Before Bridge-Nayabazar of Old Dhaka After Bridge-Aganagar, Adjacent to bridge road	Tk 5 Lakh/Month	Tk 20 Lakh/Month	Cause of Shifting to Keraniganj: After the bridge, now Keraniganj is a highly developing area. Land Developers and Housing Companies are coming. In Keraniganj area, 70-80 housing companies are working at this moment and even in Aganagar-Zinjira area there are 5-7 housing real estate agencies working. To meet this high demand, construction materials business in Keraniganj is booming



Appendix-4 : Schematic Flow Distribution through Augmentation Route (Proposed)
 BWDB Project: Rehabilitating the Burganga-Turag-Shitalakhya River System

