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Ministry of Local Government, Rural Development & Cooperatives
Local Government Division

KALIGANJ PAURASHAVA

MASTER PLAN: 2011-2031

March 2015

Technical Assistance: Local Government Engineering Department (LGED)



Government of the People's Republic of Bangladesh
Ministry of Local Government, Rural Development & Cooperatives
Local Government Division

KALIGANJ PAURASHAVA MASTER PLAN: 2011-2031

STRUCTURE PLAN

URBAN AREA PLAN:

- Landuse Plan
- Transportation & Traffic Management Plan
- Drainage & Environmental Management Plan

WARD ACTION PLAN

March, 2015



KALIGANJ PAURASHAVA
KALIGANJ, JHENAIDAH

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PREFACE

Bangladesh has been experiencing rapid urbanization in the last four decades where level of urbanization has reached from 7.60% to nearly 29% between 1970 and 2011. Multidimensional complex factors like; socio-economic, political, demographic and climatic are responsible for this higher growth of spatial transformation. The fast urbanization is putting pressure on the small towns' limited land, urban services and environment along with countries big cities. Whereas urbanization is also considered as an opportunity and an integral part of the development process. Proper development plans and guidelines with necessary legislative measures and appropriate institutional arrangement can help to achieve sustainable urban as well as rural development.

However, presently, the Paurashavas has the legal mandate to take initiatives of formulating development plans, providing infrastructure and other services and creating opportunities for people to initiate developments with sustainable and harmonic approach. In this regards, Kaliganj Paurashava had initiated steps to frame its' Master Plan (*Physical Development Plan*) by taking technical assistance from the Local Government Engineering Department (LGED). LGED under the Local Government Division of the Ministry of Local Government, Rural Development and Cooperatives initiated a project titled 'Upazila Towns Infrastructure Development Project (UTIDP)' providing all sorts of technical assistances to prepare long term physical development plan titled 'Master Plan' for Kaliganj Paurashava.

Master Plan of Kaliganj Paurashava has been prepared following the pre-requisite of the Local Government (Paurashava) Act, 2009. To prepare the Master Plan, LGED engaged consulting firm named Development Design Consultant Ltd. and set up a Project Management Office (PMO) deploying a Project Director, Deputy Project Director, experienced Urban Planners as Individual Consultant and support staffs. Regular monitoring, evaluation and feedback from PMO had also accelerate the pace and quality of the Master Plan preparation tasks. During formulation of the Master Plan, the Paurashava authority along with the project and the Consultant ensure people's opinion, observation and expectation in various ways: conducting sharing meetings, Public Hearing etc. At the end of the formulation process, the Paurashava completed all procedures necessary for its approval as per the related clauses and sub-clauses of the Local Government (Paurashava) Act, 2009. Paurashava Authority has submitted this Plan to the Local Government Division of the Ministry of Local Government, Rural Development and Cooperatives for final approval and gazette notification.

This Master Plan comprises of three tier of Plan in a hierarchical order, these are: Structure Plan for 20 years, Urban Area Plan for 10 years and Ward Action Plan for 5 years. Urban Area Plan also comprises of three components namely; Land Use Plan, Traffic & Transportation Management Plan and Drainage & Environmental Management Plan. This Master plan will serve as guidelines for the future infrastructure development of Kaliganj Paurashava together with land use control and effective management of service facilities.

The Paurashava Authority acknowledges the full support and all out cooperation from the consultant team, the Project Management office of UTIDP, LGED, Local Government Division of the Local Government, Rural Development and Cooperatives Ministry, public representatives, other stakeholders and civil society with deepest gratitude for accomplishing this remarkable assignment.

Cooperation and participation from national to local authorities, all government institutions, private entities and people of Kaliganj Paurashava will be necessary to implement this Master Plan successfully and make this Paurashava developed and livable. I hope Kaliganj Paurashava will be a model Paurashava in Bangladesh through building itself green and sustainable by successful implementation of this Master Plan.

(Md. Mostafizur Rahman)

Mayor

Kaliganj Paurashava

EXECUTIVE SUMMARY

Kaliganj is an important Paurashava of Jhenaidah District with a population of only 45341 in the year 2011. Kaliganj was established as a Thana headquarters in 1863 and was graded as a “B” class Paurashava* on 14th March 1990. Now it is class “A” Paurashava. This Paurashava is characterized by very low gross density covering agricultural land, plain and medium elevation areas.

It has higher agricultural activity as 69.89% of its land is under this land use. In next 20 years, as projections show, the gross density of population will reach only 19 persons per acre in 2091. It has still a low level of economic activities and thus potentials to flourish as a vibrant urban center in the near future. Under such circumstances, a Master Plan can help creating advantages for living and working in the Paurashava and help attracting investment for economic growth leading to employment generation. There are not much development activities going on at present as there is lack of organized system of development at present. Current development emphasizes only on road and infrastructural development. Other utilities are generally neglected. The proposed Master Plan will induce such development activities that will ensure proper provisions of utility services, urban services, community facilities and social development opportunities. It will also ensure an automated governance service of the Paurashava and ensure good collection and utilization of its resources and thus enhance the development activities in the future.

The Master Plan is prepared in three tiers - Structure Plan, Urban Area Plan and Ward Action Plan. The Structure Plan provides the policies that will guide the future development of the Paurashava. In the Structure Plan of Kaliganj Paurashava, 216.82 acres (5.50%) land is kept as core urban area, 1190.08 acres (30.17%) is new urban area, 337.26 acres (8.55%) is for Peripheral Area and the remaining 1697.20 acres (43.03%) agricultural, 351.72 acres (8.92%) circulation network area and 150.86 acres (3.83%) water body to support the future need for food and other agricultural products of the town and to facilitate the future drainage network. The Structure Plan proposes the restructuring of the organogram of the Paurashava and inclusion of town planning department comprising four town planners. This will ensure the better implementation and monitoring of the plan. It also proposes the system of periodic review and updating of the plan and the process of resource mobilization.

Urban Area Plan consists three types of Plans - Land Use Plan, Traffic and Transportation Management Plan and Drainage and Environmental Management Plan. Under the Land Use Plan, the future land use of the Paurashava is proposed according to the fixed standards during the interim phase of the Master Plan. Land Use Plan proposes 26.13% of the Paurashava land to be earmarked under Urban Residential Zone and 5.97% under Rural Settlement. These two zones will form the future residential areas of the Paurashava. Proposals for other land uses, like Commercial Zone (0.90%), Education and Research Zone (0.63%), Open Space (1.32%), Circulation Network (9.10%) etc. are made. Under the Land Use Plan, the development proposals to support the future needs of the people are also given. It proposes one heavy industrial zone, one general industrial zone, one stadium, hospitals, waste dumping ground, one vocational training institute, one bus terminals, one central park, two high schools, four primary schools, playgrounds, local parks, local markets and many other facilities.

In the Traffic and Transportation Management Plan, the Road Network Plan is proposed. The transportation facilities are proposed here in this plan. In the Road Network Plan of the

Paurashava 91.69 km of road widening and 24.49 km of construction of new road is proposed. The road hierarchy is proposed in this plan too. The proposed road network will comprise of primary road (found 60ft, 80 ft 120ft and 150 ft.), secondary road (40 ft. RoW), tertiary road (30 ft. RoW) and access/ local road (20 ft. RoW). The proposed road network and the transportation facilities along with the proposed management system will provide a good system of management for future traffic and transportation problems.

Under the Drainage and Environmental Management Plan, the drainage network of the Paurashava is proposed. This plan will analyze drainage aspects in the planning of the Paurashava, study geological fault and lineament of the project area and its surroundings, study the existing water development, flood protection and flood control project (if any) in the area and their impacts in the Paurashava plan, present planning options for drainage of the future Paurashava area, study conservation of the natural resources like parks, open space, water bodies, existing ponds etc. and conserve place of historical, architectural (if any) and agricultural importance including natural fisheries. At present, there is only 16.47 km of pucca man-made drain in the Paurashava and the natural canals and river cover 5.54 km. This network is not enough to support the present need and will not be suitable to support in the future. That is why the consultants proposed a comprehensive network of drains that comprises 5.54 km of primary drain, 66.64 km of secondary drain and 87.84 km of tertiary drain in the plan to support the drainage network.

The third and final tier of the Master Plan, Ward Action Plan, is prepared including the proposals that will be implemented during the first to fifth year of the Master Plan period. Two or more Ward Action Plans will be prepared under this Master Plan to address the need of the people for the remaining fifteen year's period of the Master Plan. This first Ward Action Plan, which is described in this report, addresses the urgent needs of the people of the Paurashava and incorporates those in the Master Plan. It analyzes the immediate requirements of the people living in the nine Wards of the Paurashava and then provides facilities in a manner that it supports the particular Ward in the first phase of the Master Plan period of twenty years.

This is the first Master Plan of Kaliganj Paurashava. It is prepared by LGED under Package – 12 of the Upazila Towns Infrastructure Development Project (UTIDP). It is expected that the implementation of the plan will induce higher level of development, ensure planned life, good community and better future.

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ACRONYMS

BM	Bench Mark
BTM	Bangladesh Transverse Mercator
CBD	Central Business District
CNG	Compressed Natural Gas
CS	Cadastral survey
DGPS	Differential Global Positioning System
DLRS	Directorate of Land Records and Survey
DPA	Demarcation of Planning Area
DPHE	Department of Public Health and Engineering
GCP	Ground Control Point
GIS	Geographic Information System
GPS	Global positioning system
K.P.H	kilometers Per Hour
K.M.	Kilometer
LGED	Local Government Engineering Department
MSL	Mean Sea Level
O-D	Origin and destination Survey
PCU	Passenger Car Unit
PWD	Public Works Department
RHD	Roads and Highway Department
RTK-GPS	Real Time Kinematics Global Positioning System
SOB	Survey of Bangladesh
TCP	Temporary Control Points
TIC	Tentative points)
TS	Total Station
UTIDP	Upazila Towns Infrastructure Development Project

LOCAL WORDS

Khal	Canal
Tempo	Human hauler
Bazar	Trade Center
Hat	Weekly an occasional Market
Paurashava	Municipality

CHAPTER 1

INTRODUCTION

1.1 Introduction

Urbanization in Bangladesh is moving at a rapid pace. Between 1961 to 1981 the average urban growth rate was 8%. The present average growth rate is about 4.5%. According to the population census of 2001, the share of urban population was about 23.29% and at present it is approximately 25%. By the year 2015, the share of urban population will be about 37% of the national population. The importance of urban development is emphasized in terms of its role in the national economy. More than 60% of the national GDP is derived from the non-agricultural sectors that are mainly based in urban areas. Again, the most foreign exchange earning sectors, like, garment and knitwear enterprises are agglomerated in urban areas. These sectors earn over 70% of the foreign exchange. Remittance is also a major sector of foreign exchange earnings and a large share of the remittance goes into the purchase of urban land. Surplus remittance is invested in business and manufacturing located in urban areas. These phenomena indicate the increasing role of urban areas being played in the national economy. The expansion of urban economy leads to the growth of urban population and concomitant haphazard urban spatial growth without planning. The rapid urbanization is marked by the creation of Paurashavas, whose number at present stands around 322. Paurashavas are created not only to provide urban services to their citizens, but also to create a livable environment through development of planned and environmentally sound living space.

The present infrastructure provisions in the Paurashavas are in a precarious state. Drains are mostly clogged that cannot drain out water during heavy rains and natural drainage systems have either been filled up or occupied by land grabbers creating water logging during monsoon. Traffic in Paurashavas is increasing day by day with the increase in population and demand. But the sub-standard road network cannot keep pace with the growing demand for movement. As a result, congestion becomes a common problem. Road networks are not developed in planned and systematic way leaving room for traffic congestion that increases economic loss to the people due to travel delay. The land use development in the Paurashavas is unorganized and unplanned, which is a major source of environmental deterioration. Building Construction Rules are not effectively enforced in the Paurashavas mainly for want of a well formulated Master Plan and qualified planning professional.

Under the above circumstances, it is high time to think about solving the problems of the Paurashavas that might otherwise be emerged critically in the future. To overcome all likely problems to come in future, the Paurashavas should go for planned development through preparation and implementation of a Master Plan. The Master Plan can be prepared exercising the power conferred to them by the Local Government (Paurashava) Act, 2009. The Upazila Town Infrastructure Development Project (UTIDP) aims to prepare Master Plan for 223 Upazila level Paurashavas and Kuakata Tourism center under 12 packages for a period of next 20 years. The project has provisions for separate plans for

land use control, drainage and environment, traffic and transportation management and improvement. The project also aims to prepare a Ward Action Plan (WAP) to ensure systematic execution of future infrastructure development projects. There is also aim to prepare proposals to enhance Paurashava revenue so that it becomes more capable to meet its own capital needs.

Of the total 223 Paurashavas, Kaliganj is one of 20 Paurashavas within Khulna Region under Package 12. The location of Kaliganj within Bangladesh is shown in Map 1.1.

Thus the Master Plan of Kaliganj Paurashava suggests for the development of urban infrastructure, such as new roads and bridges/culverts, drainage facilities, street lights, markets, bus stands, solid waste management, sanitation, water supply, community facilities and other such infrastructure in order to equip the Paurashava to face future challenges of urbanization and economic regeneration. The Master Plan will initially focus on growth and development, social integration and environmental improvement following principles of sustainable development.

Map 1. 1: Kaliganj Paurashava within Bangladesh

1.2 Philosophy of the Preparation of Master Plan

The philosophy behind preparation of Master Plan of the Upazila level Paurashava lies in the very motive of providing community welfare through a process of spatial organization, socio-economic rejuvenation, environmental improvement and provision of amenities to the present and future generations. The Master Plan aims for rational use of scarce land resources for concentrated development at urban scale following the principles of sustainable development.

1.3 Objectives of the Master Plan

As per the Terms of Reference (TOR), the objectives of the preparation of Master Plan of Kaliganj Paurashava are to:

- a. Find out development issues and potentials of the Paurashava and make a 20-year development vision for the Paurashava and prepare a Master Plan in line with the vision for the development;
- b. Plan for the people of Kaliganj Paurashava to develop and update provisions for better transport and communication network, housing, roads, markets, bus terminals, sanitation, water supply, drainage, solid waste management, electricity, education, leisure and such other infrastructure facilities for meeting the social and community needs of the poor and the disadvantaged groups for better quality of life;
- c. Prepare a multi-sector short and long term investment plan through participatory process for better living standards by identifying area based priority-drainage master plan, transportation and traffic management plan, other need specific plan as per requirement in accordance with the principle of sustainability;
- d. Provide controls for private sector development, with clarity and security in regard to future development;
- e. Provide guideline for development considering the opportunity and constrains of future development of the Upazila Town; and
- f. Prepare a 20-year Master Plan to be used as a tool to ensure and promote growth of the Kaliganj Paurashava in line with the guiding principles of the Master Plan and control any unplanned growth by any private and public organization.

1.4 Approach and Methodology

The UTIDP Project is aimed for substantial development of infrastructure and services for the Paurashava with optimum provision of opportunities for Paurashava dwellers and making scope for extending services to surrounding areas.

The current project is preparing a Master plan of the Paurashava, where the existing condition and different problems are identified, studied and analyzed and the probable solutions are to be sought to ameliorate the same. The study moves through a process of data collection-analysis and fixation of objectives for planning. The approach is based on field survey for data collection and collection of information from secondary sources. The data is presented through maps, text and tabular form. Then the survey report and maps are prepared and submitted. Analysis of collected data is carried out to identify the nature

and extent of problems prevailing in the Paurashava in order to fix the objectives of the actions to be undertaken in the form of planning and the interim report prepared and submitted. Through the process, involvement of the stakeholders has been ensured to make the planning as much sustainable as possible. For this purpose, continuous formal and informal discussions and meetings have been carried out throughout the project period using participatory approach. The discussions serve two purposes, first, a sense of belongingness develops within the minds of the stakeholders, particularly among the citizens, about the master plan to be prepared, and secondly, identification of problems and finding their solutions become easier with the participation of stakeholders, as the local stakeholders are more knowledgeable about local problems and possible solutions of those problems.

After doing all these jobs thoroughly the Master Plan had been done based on a prepared planning standard for Paurashava level town and formulating future strategies for the corresponding area. Again after final consultation with the stakeholders on the prepared plan the Final Master Plan has to be completed.

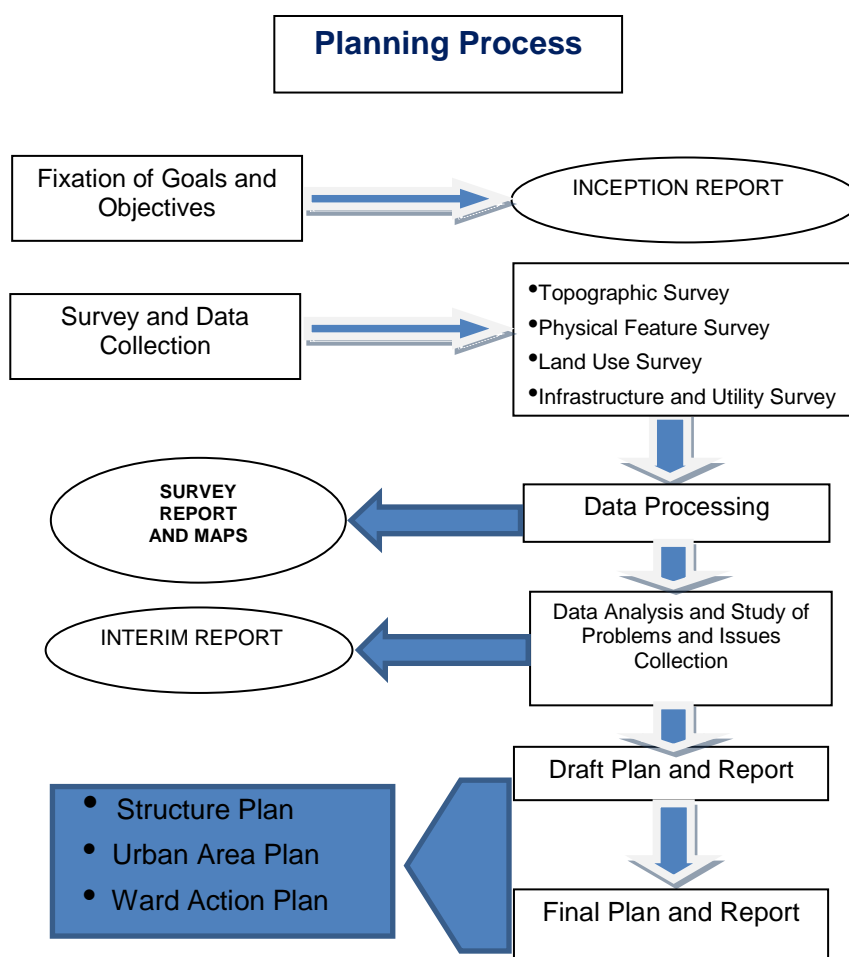


Figure 1. 1: Flow Chart of Planning Process

1.5 Scope of Work

The scope of work under this consultancy services covers all aspects related to the preparation of Master Plan, which includes Land Use Plan, Transportation and Traffic Management Plan, Drainage and Environmental Management Plan and Ward Action Plan for the proposed Paurashava. In order to prepare these plans, the activities contain but not limited to the following:

1. Visits have been made to the Paurashava at different stages of work of the preparation of Master Plan of Kaliganj Paurashava.
2. Feasibility for preparation of Master Plan has been submitted to the office of the PD, UTIDP.
3. An Inception Seminar has been organized at the Paurashava level to inform the Paurashava about the scope and Terms of Reference for the preparation of Master Plan. A thorough investigation has been made based on potential scope and opportunities available in the Paurashava to develop a 20 year development vision for it linking the ideas and view of the Paurashava people.
4. Determination of the study area and planning area has been done based on existing condition, demand of the Paurashava and potential scope for future development. A detailed survey has been conducted on the existing conditions of socio-economic, demographic, transportation and traffic, physical features, topographic, and land use of the Paurashava area following the approved format and data have been collected from primary and secondary sources. Analysis of such data and information has been carried out to find out the possible area of intervention to forecast future population of the Paurashava (15-20 years), vis-a-vis assess their requirement for different services, such as physical infrastructure facilities, employment generation, housing, right of way and land requirement for the existing and proposed roads, drains, playgrounds, recreation centers and other environmental and social infrastructure. The following major tasks have been accomplished:
 - a. Identification and investigation of the existing natural and man-made drains, natural river system, the extent and frequency of floods, area of planning intervention have been done. Other works include study of the contour and topographic maps produced by the relevant agencies and review of any previous drainage Master Plan available for the Paurashava.
 - b. A comprehensive (storm water) Drainage Master Plan for a plan period of 20 years has been prepared considering all relevant issues including discharge calculation, catchments areas, design of main and secondary drains along with their sizes, types and gradients and retention areas with preliminary cost estimates for the proposed drainage system.
 - c. Recommendations have been made on planning, institutional and legal mechanisms to ensure provision of adequate land for the establishment of proper rights of way for (storm water) drainage system in the Paurashava.
 - d. Collection and assessment of the essential data relating to existing transport Land Use Plan, relevant regional and national highway development plans, accident statistics, number and type of vehicles registered for each Paurashava have been made.

- e. Assessment has been made on the requirements of critical data and data have been collected through reconnaissance and traffic surveys, which should estimate present traffic volume, forecast the future traffic growth, identification of travel patterns, areas of traffic conflicts and their underlying causes.
- f. Study has been conducted on the viability of different solutions for traffic management and development of a practical short term traffic management plan has been accomplished, including one way systems, restricted access for large vehicles, improved signal system, traffic islands, roundabouts, pedestrian crossings, deceleration lanes for turning traffic, suitable turning radius, parking policies and separation of pedestrians and rickshaws etc.
- g. Assessment has been done on the non-pedestrian traffic movements that are dominated by cycle rickshaw. Special recommendations should be made as to how best to utilize this form of transport without causing unnecessary delays to other vehicles. Proposals should also consider pedestrians and their safety, with special attention for the children.
- h. Assessment has been made on the current land use with regard to road transportation, bus & truck stations, railway stations etc., and recommendations to be provided on actions to optimize this land use.
- i. Preparation of a Road Network Plan based on topographic and base Map prepared under the Project. Recommendation has been made on the road development standards, which serve as a guide for the long and short term implementation of road. Also Traffic and Transportation Management Plan and traffic enforcement measure have been suggested.
- j. Preparation of the Master Plan with all suitable intervention, supported by appropriate strategic policy, outline framework, institutional arrangement and possible source of fund for effective implementation of the plan.
- k. Preparation of a plan has been set out proposed Master Plan at 3-levels namely Structural Plan, Urban Area Plan and Ward Action Plan.
- l. At the first level, policies and strategies have been worked out for the preparation of a Structure Plan for each Paurashava under the package. The Master Plan has been prepared consisting of Structural Plan, Land Use Plan, Transportation and Traffic Management Plan, Drainage and Environmental Management Plan and Ward Action Plan.
- m. A total list of primary and secondary roads, drains and other social infrastructures for each Paurashava for a plan period of next 20 years has been made. Examining and classifying according to the existing condition, long, medium and short term plans have been proposed and estimated cost for improvement of drain and road alignment and other infrastructures have been prepared.
- n. In line with the proposed Master Plan, a Ward Action Plan has been proposed with list of priority schemes for the development of roads, drains, traffic management and other social infrastructures for implementation during the first five years of plan period.

- o. With the help of concerned Paurashava, at least 2 public consultation meetings or seminars have been organized, one for discussion on Interim Report and the other on draft Final Report on the proposed Master Plan. Beneficiary's point of view has been integrated in the plan with utmost careful consideration.
- p. Preparation and submission of Master Plan and Report with required standards as per the TOR.

1.6 Organization of the Master Plan Report

The Master Plan Report is organized in three major parts with an introduction at the beginning. The three major parts contain various components of work under the UTIDP of LGED. The three major parts of the Master Plan of Kaliganj Paurashava are as follows:

INTRODUCTION: It describes the ToR of the UTIDP, philosophy and objectives of the Master Plan, methodology and scope of the work and organization of the Master Plan Report.

PART – A: The Structure Plan sets the conceptual framework and strategies for planned development of the Paurashava based on its potentials for next 20 years up to 2031.

PART – B: Urban Area Plan includes i) Land Use Plan; ii) Transportation and Traffic Management Plan; iii) Drainage and Environmental Management Plan; and iv) Proposals for Urban Services.

PART – C: Ward Action Plan presents ward wise detailed proposals for implementation within first five years of the Master Plan period of 20 years.

CHAPTER 2

INTRODUCTION TO STRUCTURE PLAN

The Master Plan Report is the fourth of the series of the reports to be submitted as per the ToR of the project “Upazila Town Infrastructure Development Project - Preparation of Kaliganj Paurashava Master Plan (Structure Plan, Urban Area Plan and Ward Action Plan)”. Part A of this report describes the Structure Plan of Kaliganj Paurashava and Chapter 2 describes the conceptual issues related to the preparation of Structure Plan for Kaliganj Paurashava.

2.1 Background of the Paurashava

Kaliganj was established as a Thana headquarters in 1863 and was graded as a “B” class Paurashava* on 14th March 1990. Now it is a class “A” Paurashava. It was declared as “A” class Paurashava in 20th April 2010. Kaliganj is the third smallest Upazilla of Jhenaidah Zila in respect of population. Nothing is definitely known about the origin of the upazila name. It is learnt that in the past the Zamindar of Naldanga built a big Kali (the Goddess of the Hindu community) temple at the present place of the upazila headquarters. In course of time a trading centre meaning Ganj was developed around the temple. It is generally believed that the upazila name might have been originated from the words Kali and Ganj. Kaliganj Paurashava located at the northern part of Jhenaidah district, is the third smallest urban area in the Upazila.¹

Kaliganj Paurashava lies on 23° 24’ North latitude and 89° 08’ East longitude. The Paurashava is comprised of 9 Wards and 11 Mouzas. The Chitra River with a length of 5.54 km passes through the middle of the Paurashava. A Canal 3.62 km long passes through eastern portion of the project area. The location of Kaliganj within Jhenaidah District is shown in Map 2.1.

Kaliganj Paurashava is located at Kaliganj Upazilla of the Jhenaidah District. Kaliganj Paurashava, the project area, is located in Kaliganj Upazila about 20 km from District Headquarter, Jhenaidah. The boundary of the Paurashava is - on the north is Jhenaidah Sadar, on the south is Jessore Sadar, on the east is Salika and Bagharpar, on the west is Kotchandpur. Kaliganj Township located at the middle part of the Upazilla by the Jessore-Kaliganj Road with an area of 15.96 Sq. Km. Because of the physiographic characteristics of the region, the settlements are clustered either on higher grounds or built up linearly following the roads. The locations, history, geology, settlement pattern all have important implications in the Master Plan of Kaliganj Paurashava.

As per the Local Government (Paurashava) Act, 2009, the Paurashavas in Bangladesh are categorized mainly into A, B, and C classes based mainly on annual income of the Paurashava.

2.2 Vision of the Structure Plan

The vision of the plan is the creation of an urban livable environment, where people irrespective of their socio-economic, demographic and religious identities can live and enjoy today within affordable means without sacrificing interests of tomorrow. The implementation of Master Plan of the Paurashava will translate this vision into reality.

Map 2. 1: Location Map of Kaliganj Paurashava

2.3 Objectives of the Structure Plan

To guide long term growth within the Structure Plan Area by means of demarcation of the future growth areas and indication of potential locations of major development areas includes: a) indication of important physical infrastructure; and b) setting out policy recommendations for future development. According to the Terms of Reference, the objectives of Kaliganj Paurashava Structure Plan are:

- Description of the Paurashava's administrative, economic, social, physical environmental growth, functional linkage and hierarchy in the national and regional context; catchments area; population; land use and urban services; agencies responsible for different sectoral activities, etc.
- Identification of urban growth area based on analysis of patterns and trends of development, and projection of population, land use and economic activities for next 20 years.
- Identification and description of physical and environmental problems of Kaliganj Paurashava.
- Discussion of relevant policies to analyze and find out potential scopes for the use in the present exercise and also find out constraints and weakness of the existing policy to suggest appropriate measures for the development and management of Kaliganj Paurashava.
- To provide land use development strategies.
- To provide strategies and policies for sectoral as well as socio-economic, infrastructural and environmental issues of development.
- To discuss about implementation issues including institutional capacity building and strengthening of Paurashava, resource mobilization etc.

2.4 Concepts, Content and Format of the Structure Plan

Concepts

Structure Plan is a kind of guide plan, or framework plan, or an indicative plan that is presented with maps and explanatory texts in a broader planning perspective than other components of Master Plan. Structure Plan indicates the broad magnitudes and directions of urban growth, including infrastructure networks, the placement of major facilities such as hospitals and Upazila complex. A Structure Plan is not intended to specify detailed lot by lot land use or local road configurations and development proposals. Rather it identifies the areas where growth and change are such that more detailed local and action plans are needed. Structure Plan does not require excessive effort in gathering data and it is flexible and dynamic and can be changed to accommodate demanded changes. The present Structure Plan is an overall long term strategic plan for the Paurashava *Shahar* (Town), Kaliganj.

Structure Plan is the 1st component of the Master Plan package. The other two lower level components are Urban Area Plan and Ward Action Plan. Structure Plan lays down the framework of the future plan including strategy and the sectoral policies. The Urban Area

Plan and the Ward Action Plan detail out development proposals under the framework of Structure Plan.

Content and Format of the Structure Plan

The Structure Plan is an indicative plan that gives a brief on the future development of an area with policy guidelines. It is a long-term plan with flexibility in the sense that it sets down a broad framework for future development, but not the details. The format of a Structure Plan comprises written document and indicative major development locations presented in maps and diagrams as parts of the report. The written text analyses the issues that are not possible to be presented as diagrams, drawings and maps. Therefore, the written document is as important as the physical plan and diagrams and should be read in conjunction with each other.

The Structure Plan is set out in nine chapters.

Chapter-1 introduces the master plan project with general objectives, approach and methodology and scope of the works.

Chapter-2 presents the conceptual issues explains background of the Paurashava, philosophy of the Master Plan and vision and objectives of the Structure Plan.

Chapter-3 evaluates the present status and the development problems. It serves Paurashava's existing trend of growth which includes social and economic development, physical infrastructure development, environmental issue, population study, institutional capacity of the Paurashava, urban growth area, catchment area, landuse and urban services, functional linkage of the Paurashava with the Regional and national network and role of agencies for different sectoral activities.

Chapter-4 discusses the critical planning issues. Issues related with the transport, environment, landuse control and disaster have been emphasized. Issues relevant with the laws and regulations in case of policy formulation are also presented.

Chapter-5 presents the Paurashava development related policies, laws and regulations. The chapter highlights, landuse policy, housing policy, population policy, agricultural policy, transportation policy, environmental policy, industrial policy, health policy and national urban policy. Laws and regulations related to – national reservoir protection act, Bangladesh National Building Code, Building Construction act also indicates in this chapter. Strength and weaknesses of the existing policies also includes here.

Chapter-6 discusses the profile of the landuse of the Paurashava. It deals with the projection of Future Growth by 2031. Population projection for the year 2031, identification of future economic opportunities and projection of landuse are the major discussions of this chapter.

Landuse zoning policies and development strategies are the key elements of the **Chapter-7**. Policies for socio-economic sector, physical infrastructure sector and environmental issues are discussed here.

Implementation Issues are presented in the **Chapter-8**. Emphasize has given on institutional capacity building of the Paurashava and resource mobilization.

2.5 Duration and Amendment of the Structure Plan

The Structure Plan is to remain valid for a period of 20 years from the time of its approval that is up to the year 2031. Structure Plan can contain two Urban Area Plan for the time period of 10 years each and four Ward Action Plans for the time period of 5 years each.

2.6 Structure Plan Area

The total area of Kaliganj Structure Plan is 5443.71 acres (22.03 sq. km) that include all the 9 wards exclude the outside area of Paurashava boundary.

CHAPTER 3

EXISTING DEVELOPMENT STATUS OF KALIGANJ PAURASHAVA

This chapter of the report makes a review of the various issues related to existing growth trend of the Paurashava and unveils its problems. The existing scenario in development status concerning socio-economic, physical infrastructure and environment are presented in the following paragraphs.

3.1 Social Development

Development is a dynamic issue. Measurement of social development essentially requires time series data. Consultant collected recent data of the project area by means of sample survey (5% of total households) with no reference to previous situation. Population census reports are the only sources of information for Paurashava level data, but they cover only a selected number of issues that are not sufficient to make a qualitative judgment of social improvement. It makes a review of social development based on available population census data of 1991 and 2001, 2011 and presents the current situation using the sample socio-economic survey data. This social review indicates positive social development in Kaliganj Paurashava. As per BBS 2011, present average household size of the project area is 4.2 and is lower than the national average of 4.4. It reflects that natural population control program has a positive impact in this project area. Success is achieved in education sector. Literacy rate was raised to 65.10% (BBS, 2011) from 61.05 % in 2009 (Socio economic survey data) and 62.35% in 2001 (BBS, 2001). The employment situation is also slightly improved in this Paurashava.

3.2 Economic Development

Economic activity is the lifeblood of any urban center. The higher is the economic activity, the higher will be the level of employment and consequent physical growth. So, before going for a development plan, it is necessary to assess the current level, constraint and prospects of economic activities of the Paurashava.

The principal criterion to judge the economy of an urban center is to learn about its main sources of employment. Besides, the number of productive enterprises and tertiary level activities are also the indicators of the pattern and level of economic activities in any area. It is revealed from the sample survey on all categories of people, although 69.89% of the Paurashava area is under agriculture only 14.74% are farmers and 6.38% is agricultural laborers. So, small portion of the people is engaged in agriculture for their livelihood. About 54.21% populations are engaged in public and private sector services and trading activities, 9.74% are laborers. And rests are not engaged in formal earning activities. So, the economic picture of the Paurashava is not very bright. Poverty haunts a large portion of its population and activities in the service sector have not yet gained momentum.

3.2.1 Economic Activities

Industry`

Except some small scale processing units, there is virtually no manufacturing, as such, in the Paurashava. The major industrial structure of the area is Mubarakganj Sugar Mill. There are some number of rice processing units and saw mills in the town also.

Commerce

The commercial activities in the Paurashava are dominated by retail business. Kaliganj Bazar is the main bazar in the Paurashava located at Ward no. 05 which provides daily necessities for the local people. One hat sits just at the northern side of railway platform.

Services

The household survey shows, out of the employed population, 4.22% of the adults are engaged in service of different kinds as employment. Among them, 2.11% work in different public sector agencies, while 2.11 % serves in private enterprises that include shops and other business enterprises.

Agriculture

Sample survey by the consultant reveals that 14.74 percent of the male income earners in the Paurashava are engaged in farming occupation. Besides 6.38% are farm laborers living in the Paurashava. The farmers and farm laborers work in farm lands, both, within and outside the Paurashava. It is evident from land use survey of the Paurashava that about 70% of the Paurashava lands are still under agriculture.

Agro-based

As the Paurashava is mostly rural in nature at present, with effective agricultural extension services, the agricultural output can be increased many times to serve the agro-based industries in future. In this backdrop, the major challenge is to strike a balance between urbanization and maintenance of rural nature of the project area.

Informal Sector Economic Activities

Informal sector study was not a part of ToR, so the consultant did not conduct any formal study on this sector. It can be considered that the informal sector characteristics at upazila level Paurashava are same all over Bangladesh. It is more prominent, where the concentration of people takes place. Informal sector is a part and parcel of urban economy in developing countries. The most important feature of informal sector is the sellers carry their goods to the buyers and their concentration is more where agglomeration of buyers is more. They have small capital and are usually self-employed. In Kaliganj, the concentration of informal businesses is found around the bazar area, transport terminal and stoppages and also near the Upazila Complex.

3.2.2 Existing Employment Pattern

The existing employment pattern shows a bias towards trading. Since secondary sector employment is seriously lacking in the town, people move to self-employment like trading. Trading has been found feasible as employment mainly, because of higher level of

affordability of the people powered by remittance they receive from abroad regularly. Table 3.1 shows the percentage distribution of occupation of the people of Kaliganj Paurashava.

Out of the employed population, more than 42.01 percent is engaged in business, and less than 0.79% in household work. Total 2.51 percent of the households are skilled labor and 0.79% is unskilled labor. Of the total surveyed population, 0.53 percent is student. The scenario is unlikely to change unless there is any major investment in the industrial sector that can pool a large number of workers and render the local economy more vibrant services.

The employment scenario of the Paurashava is unlikely to change shortly unless there is any major investment in the industrial sector that can pool a large number of workers and bring vibrancy to the local economy. It is evident from household survey that there is insignificant employment in the service sector. It is unlikely that public sector jobs will show any major improvement in future. But with the increase in business, and industry there is possibility that private sector jobs will show further increase in future.

Table 3. 1: Percentage Distribution of Occupation

Occupation Type	Ward No.									Total
	1	2	3	4	5	6	7	8	9	
Govt. Officer	2.27	3.28	2.5	3.13	1.56	6.06	0	0	0	2.11
Other Govt. Employee	2.27	3.28	5	3.13	1.56	0	4	0	0	2.11
Teaching	2.27	8.2	0	0	1.56	3.03	12	0	12.2	4.21
Farming/Agriculture	9.09	0	22.5	31.25	1.56	12.12	4	52.5	14.63	14.74
Housewife	0	0	0	3.13	1.56	3.03	0	0	0	0.79
Large Business	0	8.2	0	0	0	12.12	28	0	0	4.21
Small Business	52.27	36.07	45	37.5	42.19	39.39	48	7.5	34.15	37.89
Private Service	9.09	13.11	0	6.25	3.13	3.03	4	15	14.63	7.89
Handicrafts	0	0	0	0	1.56	0	0	0	0	0.26
Skilled Labor	15.91	11.48	15	9.38	15.63	3.03	0	0	0	8.95
Unskilled Labor	0	1.64	0	0	3.13	0	0	0	0	0.79
Rickshaw/van Puller/Driver	4.55	4.92	7.5	6.25	18.75	9.09	0	22.5	24.39	11.58
Hawker/Vendor	0	0	0	0	0	9.09	0	2.5	0	1.05
Student	0	1.64	0	0	1.56	0	0	0	0	0.53
Unemployed/Retired	2.27	8.2	2.5	0	6.25	0	0	0	0	2.89
Total	100	100	100	100	100	100	100	100	100	100.00

Source: Socio-economic Survey, 2009.

3.3 Population

The total population of Kaliganj Paurashava is 45341 in the year 2011 (Source: BBS, 2011). According to 2001 population census the annual population growth rate of the Paurashava is 2.6. The Paurashava comprises of 11 mouzas. The density of population is 2829 persons per sq.km. Kaliganj Paurashava has 10637 households.

According to BBS 2001, the total population of Kaliganj Paurashava was 36033 and the density of population was 2247 people per sq. km with an annual growth rate of 1.43%. At Present, Ward no. 03 is the most densely populated area. The density per acre is 16 in this ward, followed by 12 for Ward no. 07. Details are given in Table 6.1, in Chapter 6, Part A of this report.

Size and Type of the Family

The Average household size of the project area is about 4.2 and is lower than the national average of about 4.4. It reflects that natural population control program has an impact in the project area. The household size range 3-6 is known to be larger among the households taken for interview. This household size occupies almost 76% of the total households. The socio-economic household survey reveals that most of the families in the study area belong to single family.

Sex Ratio

The average sex ratio (males per 100 females) for the project area is 100:124 which is higher than the national average (100:106). The maximum population were in age group 26-35 and the female out numbers the male counterpart. And maximum female population falls within this age group which is 25.45%.

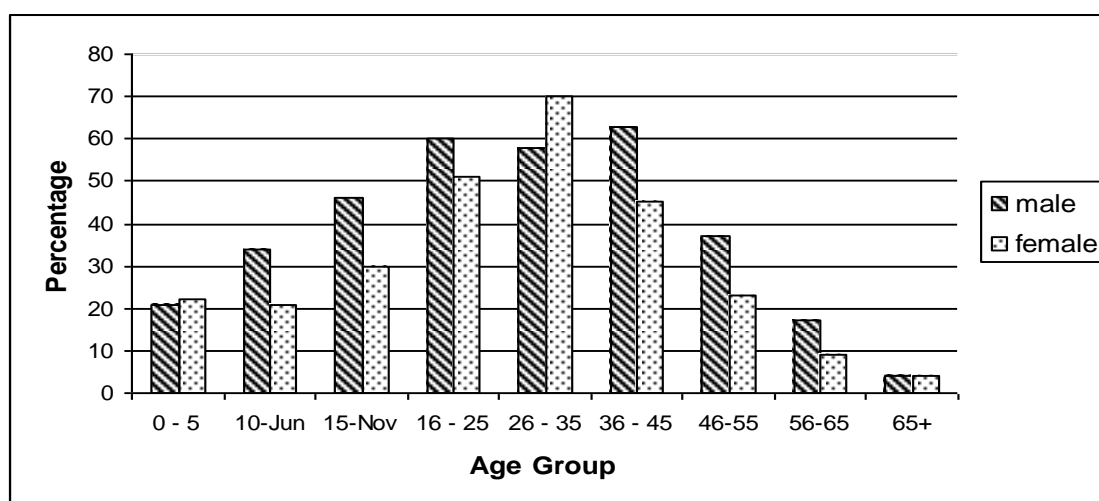


Figure 3. 1: Percentage Distribution Population of Kaliganj Paurashava by Age and Sex.

Marital Status

The percentage of married and unmarried population is almost equally distributed (as per the socio economic survey). A negligible percentage of population is widow or widower. There is no respond of divorce, which is a good social aspect for the Paurashava. In marital status, 45.88% male and 58.18% female populations were found married.

Religious Status

By religion, 92 percent people of the study area belong to the Muslim community. A sizeable percentage (the remaining 8%) Hindu community is also present here.

Education

Kaliganj has about 11 percent illiteracy rate of the population (Field survey, 2009). Total 28.16% population of surveyed population of Kaliganj Paurashava has only primary level of education. Only a small percentage (5.53%) of population has educational background up to degree level. Although the Paurashava is observed to have high illiteracy rate, yet it lacks in skilled labor forces as proportions of people with higher education, especially with

technical education are bare minimum. Details were given in Survey and Interim Report of Kaliganj Paurashava.

Monthly Income and Expenditure of the Household

Maximum number of household (46.58%) earned tk.3001-tk.5000/month where 45.79 percent spends the same amount of money as monthly expenditure. Only 1.32 percent of family has earning level above Tk. 15000/month.

Migration pattern

About 64.74% of the people have been living in Kaliganj Paurashava since their birth. This may be a positive factor for future development as people know themselves since their early life. This will enable the local authority to encourage a participatory approach in development. Only a small percentage of people are migrants from elsewhere, but have been living here for a long time. The survey also reveals that most of the people are not interested at all to move from here in future.

3.4 Physical Infrastructure Development

Buildings and Structures

Kaliganj Paurashava has mainly grown following the major transport networks. Buildings and structures developed along the road network system of the Paurashava. In Kaliganj Paurashava 88.56% of total structures (18407) are used as residential purposes. Physical Feature Survey findings reveal that the Paurashava area is dominated with katcha residential structures (45.36%) in all wards. Semi-pucca and pucca structures are found to be 33.48% and 20.81% respectively. Most of the pucca structures (47.97%) are concentrated in Ward No. 5. Highest concentration all types of residential structures (38.06%) are also found in the Ward No. 5 and the lowest concentration (3.01%) of residential structures are found in Ward No. 6. Buildings of low heights are dominant in the project area. Almost 95.22 percent residential buildings of the project area are single storied.

Transport and Communication

Four major roads coming from four different directions meet together at the Bus Stand More. The roads coming from different places are; Kushtia, Jessore Road, Kaliganj Bazar and Khalishpur. All the roads meet together at zero point of the town, at Kaliganj Bus Stand Mor. Nimtala Mor is another places where again four roads are meets. The total length of roads in the Paurashava area is 109.79 km. of which, 19.33 km. katcha, 55.75 km. pucca and 34.71 km semipucca road. There is about 6.42 km of roads of Roads and Highways Department (RHD) within the town.

There is a specific bus stand at Kaliganj Paurashava. All sorts of buses stop and departed from the Bus Stand Mor. Another Bus stand is located at Nimtola Mor which is called "Nimtola Bus Stand Mor". The location of the terminal has been proposed in the plan after detailed analysis of the traffic situation. There are 2.85 km of Rail way in Kaliganj Paurashava. The railway station is located at the northern part of the Paurashava in ward 05. Through railway network Kaliganj linked with Dhaka, Khulna, Rajshahi and other major cities of our country.

3.5 Utility Services

The following paragraphs present the existing condition of utility services in the Paurashava.

Electricity: The people of the Paurashava area enjoy electricity facility. About 86.43% respondent tells that they have electric connection at moderate level. And 13.57% respondent tells that they have no electricity facility. In Kaliganj Paurashava electricity is provided only in all wards by the Rural Electrification Board (REB). There is no electric sub-station in the Paurashava area. It has a total of 1137 electric poles to facilitate electricity throughout the Paurashava area

Water Supply: Kaliganj Paurashava has no piped water supply system. Nominal percentage has private tap water collection system. Paurashava does not provide any deep tube wells for water supply. Shallow tube wells are the main source of water collection. From the physical feature survey there are 4446 shallow tube wells and 1 deep well within the Paurashava.

Telecommunication: There is a telephone exchange having a capacity of 150 lines maintained by Bangladesh Telecommunication Company Limited (BTCL) in the Paurashava area with 102 telephone poles. At present there are nearly 25 land telephone users in the area. There are also mobile phone networks of GrameenPhone, Robi, Citycell, Banglalink, Airtel and Teletalk with 8 mobile towers, which cover the entire study area.

Solid Waste Management: Solid waste collection and disposal in Kaliganj Paurashava is the responsibility of Paurashava authority. The logistics for collection and disposal of solid wastes include 4 sweepers for collection and 1 garbage truck for transportation. There is no dustbin and dumping site in the Paurashava. The collected waste is dumped into the lowland. CBO or NGO based collection system does not exist within the Paurashava area.

Gas Supply: Gas supply is not available in the entire Paurashava area. Few households have been found using Liquid Petroleum Gas (LPG) for domestic purpose. There are 8 LPG retail shops within the Paurashava area serving the local demands.

Drains: Total length of drainage network at Kaliganj Paurashava is 16.47 km. Most of the drains are established by DPHE and Paurashava authority which are mainly situated in the core part that is in Ward Nos. 3, 5 and 7.

3.6 Environmental Issues

Surface water of ponds, canals and rivers at Kaliganj is observed to be fresh and free from salinity. Water Development Board has taken a project to protect the Paurashava from river erosion by constructing embankment. With the development of a planned drainage system some environmental problem will be minimized.

From the overall survey findings, it has been revealed that the inhabitants of the Paurashava do not face any severe environmental problem. The problems that exist here can be mitigated through proper planning of the Paurashava.

The urban environment of Kaliganj Paurashava includes both built and natural environment. Urbanization has some increased hazards on natural environment. Where

the built environment overburdens the natural environment urban development cannot be sustainable. The urbanization is vital for country's economic growth. Urban centers concentrate services, infrastructure, labor, knowledge, entrepreneurship and markets. Cities and towns are key generators of economic activities. The urban economies are critically important in national economic growth and of development goal. Urbanization is unavoidable. So in every phase of planning processes, all these environmental issues have been evaluated and proper measure has taken to minimize the adverse environmental impacts on land pollution, water and air quality, biodiversity resources and marine resources by energy usage, transport network, waste management, slum improvement, disaster etc.

3.7 Institutional Capacity

The implementation of the Master Plan will require strengthening of the capacity of the Paurashava Authority. Although the capacity building is going in different ways by the government, the institutional capacity building for implementing the Master Plan of the Paurashava has not yet been seriously considered. This will be an important task for the government to restructure the organogram and include the required technical staff with appropriate job description for addressing the issues of implementing the Master Plan.

Existing Manpower

Kaliganj is a class "A" Paurashava. According to Paurashava manual there should be 129 officials engaged in a class "A" Paurashava to manage the engineering, administrative, health, family planning and conservancy works within the Paurashava area. In this organogram Mayor has in the top position. These divisions are Engineering division (headed by Assistant Engineer), Administrative division (headed by Secretary), Conservancy, Health and Family Planning Division (headed by Health Officer). In this organogram both full time and contractual official have to be engaged. Paurashava has only 25 officials against 129 officials mentioned in Paurashava manual organogram. Engineering, administrative, health and family planning section is not well established at Kaliganj Paurashava.

Paurashava Town Planning and Implementation Capacity of Master Plan

At present, the Paurashava has no town planning section or any appropriate manpower, especially Town planner to prepare or implement town plan. The existing capacity of the Paurashava is seriously inadequate to implement the Paurashava Master Plan. The Paurashava must strengthen its capacity to implement its Master Plan, when it is completed by employing requisite manpower.

Conservancy and Health Services

Condition of solid waste management at Kaliganj Paurashava is also very poor. At present there is no dustbin at the Paurashava. But there are some private arrangements for waste dumping. The logistics for collection and disposal of solid wastes include 4 sweepers for collection and 1 garbage truck for transportation. Hospital waste has been dumped at their own dustbins. There is one Upazila Health Complex which provides health service to Paura population.

Logistic Support/Equipment

According to the Paurashava manual, class “A” Paurashava will get logistic support/equipment to continue the work properly. This includes one jeep, one road roller (5-7 ton), two trucks/tractors, two motor cycle, three by cycles (according to the needs of the Paurashava), one mixture machine, one type writer machine, one photocopier machine and one duplicate machine. Kaliganj Paurashava got almost all of these logistic supports from government.

3.8 Urban Growth Area

The total area of Kaliganj Paurashava is about 15.96 sq. km. Current Jessore-Kaliganj Road is the main road transportation link on Kaliganj Paurashava. Other roads of the Paurashava linked with the Jessore-Kaliganj Road. Kaliganj Bazaar was established beside this road and adjacent to the Chittra River. The growth started adjacent the Bazaar area and Upazilla Parishad area. Growth direction indicates that Kaliganj mouza located in the Middle part of the project area is having higher concentration of development and therefore surrounding areas of the bazaar area of Kaliganj Paurashava are highly populated. The development of the project area is taken place in the area centering the market place (Vide Figure 3.2). On the other hand administrative headquarters are established in the core part of the project area (Ward No. 7).

In the project area, urban development is taking place also both sides of the Road rapidly. Development pressure is also found in important transportation node. Currently, linear pattern of growth is observed along the Road links of Kaliganj Paurashava.

Other areas (North-West, North and South-West Portion of project area) include rural settlements which have been developed in a scattered manner surrounded by agricultural lands. Figure 3.2 shows the growth direction of Kaliganj Paurashava.

3.9 Catchment Area

It is widely recognized that there is a strong interdependence of social, economic and environmental development between rural and urban areas. The cities and towns play an important role in rural development as markets for their goods and products, and also as the sites for food processing and other agricultural related activities, and as source of non-farm income, especially from wage labour. On the other hand, urban areas rely on rural areas for food production, labour, and raw materials for manufacturing and markets for their products. This linkage is stronger in small town like the Paurashavas, primarily due to their proximity to the surrounding rural hinterland. People of the catchment areas can access public service offices and hospitals in the towns with less difficulty than offices in cities, while schools and other facilities serve a large number of the catchment area population, contributing significantly to rural development.

Transport and communication connectivity is an important factor for economic development of an area. It has a good road communication network with Jhenaidah and nearby Upazila towns. The railway passing through the heart of the town connects with major important cities of the country. The regional transportation network is shown in Map 3.1.

3.10 Land Use and Urban Services

The general land uses of the project area are shown in Table 11.1 in Chapter 11, Part B of this report. In the land use pattern of the Paurashava, 19 types of land uses are found. It is clearly evident from the table that agricultural land use (69.89%) dominates the Paurashava area, followed by residential (16.48%), water bodies (4.03%), circulation network and transport and communication (only 2.19%), vacant place (2.21%) and government services (0.43%) and educational land use occupy 0.45 percent of land.

Rapid urbanization by gradual transformation of agricultural land to residential or commercial land use is evident in Kaliganj Paurashava. Business opportunities created by closer proximity of the Paurashava to Jessore-Kaliganj Road, existence of various urban facilities such as 12 health service facilities (e.g. clinic, health complex), 35 educational service facilities (e.g. school, college, madrasa) are the major accelerating the rate of urbanization in the Paurashava resulting land use changes in the Paurashava. Moreover, fertile agricultural land and growing agro-based SMEs contributed to enhanced socio economic condition of the inhabitants of the Paurashava which could be thought as an influencing factor for land use transformation in the Project area.

In Kaliganj Paurashava electricity is provided only in all wards by the Rural Electrification Board (REB). Piped water supply system is not introduced within the Paurashava area. Solid waste collection and disposal in Kaliganj Paurashava is the responsibility of Paurashava authority. The logistics for collection and disposal of solid wastes include 4 sweepers for collection and and 1 garbage truck for transportation. There is no dustbin and dumping site in the Paurashava. Gas supply is not available in the entire Paurashava area.

3.11 Paurashava Functional Linkage with the Regional and National Network

Any development initiative at the local level must relate to the national level plans in order to achieve cohesion and integrity with overall development of the country to attain the national development objectives.

The present system of national level planning hardly links the local level plans. The present system of allocation of resources in national development budget is a top down approach, which is highly influenced by political objectives. As a result, urban sector is not yet considered a priority sector and due to resource constraint, many problems of the Paurashavas remain unresolved. Therefore, it is important to establish a linkage between the local plans and the national development plan so that aspirations of the people can be realized. National development plans are prepared considering the overall needs and aspirations of the country with respect to different sectors of development.

This necessitates for a bottom up approach of development planning and the budget allocation should be made according to the choice of the local governments who are accountable to the Paurashava people directly. Budget should be allocated according to the priority list of the projects prepared by the Paurashava that is supposed to reflect the needs of the Paurashava people as the list can be prepared by the counselors and the Mayor who are directly elected by the people.

The aim of the Structure Plan is to prepare a development plan for Kaliganj Paurashava with full participation of its stakeholders. In the process of planning, a large number of development projects have been identified in different sectors. Implementation of development projects will improve infrastructure and services and will create an environment for utilization of local resources. This will attract more investment in the locality to generate new employment. New employment will generate income for the poor people and shall improve the poverty situation, which is the main objective of PRSP. New jobs will also be created during implementation of various development projects of the Paurashava prepared under the master plan. New and improved road infrastructure will increase mobility vis-a-vis economic activities of the Paurashava that will help to address the problems of unemployment.

The current program of Paurashava Planning helps to address urban poverty through adequate steps taken up to accelerate urban infrastructure development based on the Kaliganj Paurashava Master Plan. The new developments will induce new investments in trade and industry and lead to generation of more employment in the service, construction, transport and informal sectors. This will directly assist in reducing poverty. It will help absorb additional work force of rural areas as a result of natural growth of population. Agricultural sector has limitations in absorbing labor force.

Map 3. 1: Regional Connectivity of Kaliganj Paurashava

3.12 Role of Agencies for Different Sectoral Activities

The successful implementation of Structure Plan depends upon efficiency of the stakeholders and the degree of integration and coordination among them. Structure Plan of a town involves a complex affair having numerous stakeholders influencing the decision making process of development.

Care has been taken for all programmes and projects to be developed in a sound manner technically, socially, environmentally and institutionally with full participation of local communities. Due care has been taken so that there have no significant adverse internal or external environmental impacts. Sustainable urban development based on a continuous dialogue between the actors involved in urban development is needed to improve the urban environment. It is expected that after the completion and implementation of the Master Plan as well as the mentioned projects and programmes of other organizations in Kaliganj, a small town of Khulna region will develop with its full potential.

Development Schemes Implemented by the GOs

The recent infrastructure or development schemes implemented by the Government includes roads, road lights etc.

Kaliganj is agriculture based urban area and Upazila Agriculture Office has a significant influence on its agricultural sector. Central Government use subsidy for the betterment of the farmers.

Electrification of Kaliganj is directed by Polli Biddutayan Board (Rural Electrification Board-REB) has a master plan to avail 100% electrify the whole Upazila including the Paurashava area. The master plan includes priority basis electrification to the residents and the commercial establishments. According to census 2011, a total of 84.70% of the dwelling households reported to have moderately satisfied with electricity connection.

Local Government and Engineering Department (LGED) have an upcoming project of construction of roads, culverts and box culvert within the Paurashava. And LGED of Kaliganj is responsible for maintenance of Kaliganj.

Development Schemes Implemented by the NGOs

No mentionable infrastructure development project was undertaken by the NGOs in the Paurashava. Different NGOs at Kaliganj Paurashava provide mainly micro credit service. ASA, Proshika, Muslim aid UK Bangladesh, Grameen Shokti, BURO Bangladesh, Micro Credit Organization also are present within the Paurashava Boundary. Only ASA and an organization named microcredit organization provide micro credit service and money transfer service of western union. Grameen bank of Kaliganj Paurashava provides micro credit and house loan service for the poor people. BRAC along side micro credit program provides other type of program for the wellbeing of the local people program provides other type of program for the wellbeing of the local people.

Development Schemes Implemented by Private Sector

There are a few development works that have been implemented by private sector. Some commercial activities and private schools have been developed by private initiative.

CHAPTER 4

CRITICAL ISSUES FOR PLANNING

Deficiency in infrastructure and services is one of the major critical problems of the Paurashavas in Bangladesh, and Kaliganj is no exception. The reasons for such deficiency may vary, but are mostly linked with the institutional capacity and resource potential of the Paurashavas. The institutional capacity of each similar category Paurashava in terms of manpower and other logistics at present can be same across the country, but their efficiency and performance in practice may vary for a variety of reasons.

Chapter 4 describes the critical issues for planning based on the existing conditions in respect of Socio-Economic and Demographic issues, Transport and Communication, Urban Utilities, Drainage and Environment, related other issues namely disaster, land use control, law and regulation etc. The weaknesses in the present development processes are also taken into consideration to identify the critical issues for planning at Kaliganj Paurashava.

4.1 Socio-Economic and Demographic Issues

Most of the Paurashavas in Bangladesh are basically urban centers with direct links to rural areas. There are significant differences in the standard of socio-economic well being and demographic characteristics of these small towns with large cities in the country. Most of these Paurashava towns have small population, not enough to sustain economic growth to render services and facilities for quality of life needed in an urban environment. As a result, qualities in socio-cultural and demographic matters suffer from inadequacies in their requirements of facilities and services of various kinds. Since Kaliganj Paurashava has all such problems and shortcomings, in the preparation of various components of the Master Plan, this aspect of reality in development has to be addressed for sustainable solutions.

4.2 Transportation and Communication

Transportation and communication network plays very important role in the growth pattern of both urban and rural settlements and their socio-economic and environmental development. Houses and other establishments always prefer road side lands to have easy access to different places and functions. The transportation and communication network at Kaliganj Paurashava is not yet planned and developed to serve a town. Most of the cases road network is established after the development of infrastructure resulting poor layout of road network, narrow road, pedestrian problem, utility services problem, emergency services problem etc. The Paurashava has a very low traffic volume to sustain high cost of development in this sector, particularly in areas of low population density and scattered settlements. However, without planning a transport network for the Paurashava area as a whole, a standard transport network and an efficient traffic management system for the future can not be ensured. The nature of problems and deficiencies are identified below.

a. Unplanned and Narrow Road

Roads in the town are being developed without using any planning standard and network plan. As a result, narrow roads with tortuous pattern are common. Narrow roads and poor maintenance of roads are major problems for traffic movement in some parts of the Paurashava. New houses and other structures are cropping up along these sub-standard narrow roads. This is likely to pose traffic movement problems in the future, when development becomes more intense and density of population increases. The existing narrow roads require widening and improvements of pavement. Some road segments within the Paurashava are built in an unplanned manner. These segments will require improvement as per future traffic volume and required space for turning lane in the intersections. Narrow width of roads and poor maintenance has marked by most respondents as major road problems in the town. Total 64.74% of the respondents have pointed to the misery narrow width of. Narrow width of roads is likely to become a major problem of traffic movement when the town grows and density of population increases in future.

b. Traffic Congestion

A very low level of vehicular traffic in the streets of the town does not pose a problem in terms of congestion at present. However, the consultant studied the traffic movement all over the town and has identified two main points where the Traffic Conflict is the highest. These are Bus Stand Mor (intersection) and Nimtala Mor (intersection). The surrounding area is considered as central area and there exists market and commercial establishments. Again, the slow moving vehicles like, rickshaws and vans come in conflict with motor vehicles at these points, creating traffic congestion. As the number of slow moving vehicles is higher the conflicts are usually frequent. The slow moving rickshaws, on street parking and on street loading-unloading of goods are found to be a major source of traffic congestion.

Reason for Congestion

- Lack of management is the prime reason for traffic congestion. There is a common tendency among the rickshaw pullers to disobey rules. They roam about the busy areas in search of passengers and park rickshaws at critical points leading to congestion.
- Improper intersection design, on street parking of vehicles, waiting of operators on the roads looking for possible passengers, absence of traffic signal, disobedience of traffic rules, etc.
- There is no proper and adequate space for parking auto-rickshaws and tempos. They are parked on the road. On road waiting for trips by these vehicles is also a source of congestion.
- Local buses often take passengers from wherever they find. In the same way, they disembark passengers according to their desires. These practices hamper smooth traffic movement.

C. Bus, Truck, and Tempo Terminal/Stand

In Kaliganj Paurashava there is only one Bus Terminal which is the main terminals point for all kind of Motorized vehicle. There is a bus stoppage named Nimtala Bus Stand More in this Paurashava. The location of the terminal has been proposed after detailed analysis of the traffic situation. There is also no specific Tempo stand at Kaliganj Paurashava. The railway station is located at the northern side (ward 05) of the Paurashava. There is also a river port and terminal at Ward No. 7 in Kaliganj Paurashava.

Map 4. 1: Map of Unplanned and Narrow Road of Kaliganj Paurashava

4.3 Urban Utilities

A key issue related to the sustainable development of planning area providing a minimum quality and standard of living, pertains to the availability of and accessibility to basic infrastructure facilities, viz. water, power, sewerage, drainage and solid waste management. The present state of infrastructure problems in the Paurashava may become a cause of crisis. At present, state of telecommunications and power scenario in Kaliganj Paurashava is not so good. There is no water system in this Paurashava. Thus critical need of advance action and arrangement is required for adequate provision of physical infrastructure.

4.4 Drainage and Environment

a. Drainage Problem

Majority of the population at Kaliganj Paurashava is deprived of drainage facility. Unmanaged waste is washed out into the roadside drains and natural canals. Blockage of drains by solid waste reduces the carrying capacity of drains and natural canals and become a source of pollution. Paurashava has very limited resources to clean the drains. It has been observed that in some areas, domestic sewage conveys directly to these water channels. As a result, water logging is a problem at some parts of Kaliganj Paurashava.

b. Waste Management

The sources of surface water pollution are domestic waste, unhealthy sanitation and extensive use of fertilizer in the agriculture. Condition of solid waste management at Kaliganj Paurashava is also very poor. There is no dustbin or dumping of the wastes. Dumping also occurs in the ditches which creates major health hazards when season of water logging begins. There is neither any solid waste treatment plant nor any solid waste collection network encompassing entire Paurashava. Paurashava is partly covered by Solid waste collection system around the core part. The present practice of dumping consists of truck used for carrying waste. The existing management capacity of Paurashava consists of 4 sweepers and a garbage truck for transportation. Hospital waste has been dumped at their own dustbins. Garbage of kitchen markets are dumped at nearby vacant places.

b. Water Supply

Water demand is meet mainly by hand tube wells and most of the households have their own hand tube wells. There is some limited provision of piped water supply of Kaliganj Paurashava authority in some Wards. In other wards households themselves establish electric motor instead of hand tube well for piped water supply to meet individuals' water demand. Due to increasing demand for piped water supply and no intervention by the Paurashava authority, environmental hazards can occur by haphazard development of water supply system and water pollution because of contamination. In addition, scarcity of safe drinking water can lead to creation of severe diseases of which cost may be higher than the cost of planned development.

4.5 Disaster Issues

Bangladesh is a land of abundant and regular rainfall and the annual inundation of the rivers. The whole district is practically free from drought. Water, however, subsides rapidly and the damage caused is not mostly very serious. Although it is located along the bank of Chitra River, Kaliganj Paurashava is not an erosion prone area due to steady flow and low river stage. The Paurashava was not affected by recent flood.

4.6 Land Use Control

A Land Use Plan of the town was prepared in 1987 by Urban Development Directorate (UDD), but it was never brought into practice due to lack of regulatory measure for implementation. Instead, discretionary decisions are used in case of land use decisions. The Land Use Plan at that time was prepared for the Upazila Headquarters by UDD, but remained under the administrative control of the Ministry of LGRD & C. So conflict and lack of legal basis in implementation prevailed. In the present context of socio-economic demand and land use dynamics in the country, development of a Paurashava without a Master Plan can not be imagined. The preparation of Master Plan is mandatory as per Local Government (Paurashava) Act, 2009.

4.7 Laws and Regulations

Absence of adequate planning and development control is a problem in all urban areas of Bangladesh and Kaliganj is no exception. A number of legislative measures are there to help the administration of urban area, urban development and management. But all of these planning laws cannot be readily enforced and many of them are not adequate in regulating planned development. Due to lack of proper implementation and enforcement, many important laws are mostly not applied by the urban local governments. As a result, weakness in the implementation of planned development in the Paurashava remains to be a critical problem and has to be addressed.

A substantial portion of national resource is invested in building construction in both public and private sectors. In order to ensure optimum return of this investment and to achieve satisfactory performance of the buildings in terms of safety, serviceability, health, sanitation and general welfare of the people, building construction needs to be controlled and regulated. Legislative measure for such control has been provided in the East Bengal Building Construction Act, 1952 and from time to time, regulations have been promulgated by the government under the Section 18 of this Act. As per law, it is mandatory to get any structure approved from appropriate authority before construction. Permission for building construction in the Paurashava is administered by this authority within its jurisdiction. However, as elsewhere in the country, noncompliance to these rules is also observed here.

a. Weak Local Government

Though Paurashava is a democratically elected urban local government, its authority is limited to work as a local government. In most cases, prior government permission is required before taking any legal action against unscrupulous acts. Section- 66, Section-69 (1) and (2), Section- 72 (4), Section-32 (2) of the Local Government (Paurashava) Act,

2009 are few examples. This is one of the reasons that there has been a little progress in decentralization of governance at local level in Bangladesh.

b. Lack of Fund and Manpower

Local bodies in this country are in constant shortage of funds. The sources of the Paurashava's income are generally taxes, rates, fees and charges levied by it, and rents and profits accruing from individuals and institutions. The government grants, profits from investments, receipts accruing from the trusts placed with it, loans raised by it and proceeds from other services are the other sources of income for the Paurashava.

The lack of efficient manpower, poor assessment system, and weak legal enforcement for practicing an efficient revenue generation and collection system are the main reasons for the current weakness in the financial management. It is widely accepted that there are also corrupt practices in our public institutions in delivering services, which require to be addressed through institutional and legal reforms.

c. Public Participation in Plan Making Process

The planning and development Acts of earlier times had contained a little scope for the authorities concerned to seek public opinion on their city/town plans prepared before they are sent to the government for final approval. Not having any scope for public participation is against the democratic norms of an elected urban local government like the Paurashava Authority. The authority must involve people by law in the planning and development process, and hear their views, needs and grievances to mitigate problems. This vital aspect should be incorporated in a stronger manner in the law through revision.

d. Coordination of Activities of Public Sector Development Agencies

There are a large number of public sector development agencies working in the town and surrounding areas, but there is lack of coordination among activities of these development agencies. Absence of coordination results wastage of resources and often brings misery to the people. This is commonly evident in our urban development works, for example, as one agency digs the streets for telecommunication network and repairs the streets, another agency starts digging for sewerage ducts. Effective coordination by law in this case is necessary for an integrated approach in development saving time and resources. There should be legal provisions for such coordination by the Paurashava Authority to ensure accountability of the agencies working for their respective jobs in the Paurashava area.

e. New Rules for Practicing Planning Standards

At present, there is no standard for infrastructure, services and facilities provided by the public sector. There is need to formulate standard rules for services and facilities and get incorporated in the Paurashava Act to secure public interests. A standard has been set in the UTIDP for future land use proposals in the Master Plan of the Paurashava.

f. Betterment fee

Due to failure of execution of the powers of charging betterment fee, all the benefits of land value enhancement due to Paurashava development of infrastructure go to the adjacent landowners or the persons having interest therein. A proper execution of betterment fees will help increase in revenue earning of the Paurashava.

g. Penalty for Violation of Plan Provisions

The penalty for violation of plan provisions provided in the Ordinance (Section 49) is only Tk. 5000/ and for delay Tk.50/day, if violation continues further after notification. This is an extremely low rate of penalty, which should be revised for a substantial increase to prevent any violation effectively. The penalty provision should be more stringent to ensure enforcement of plan provisions.

4.8 Existing Problems and Weaknesses in the Development

The two major problems that currently exist in Kaliganj Paurashava include the following:

- a. The Paurashava town has a weak economic and revenue base that does not support improvement in the socio-economic well-being of the people. The Paurashava authority for lack of resources, fails to make required investments in the development of physical infrastructure to improve the quality of life of the people living in the town.
- b. The Paurashava has also no definite plan for the development of various physical infrastructures in a planned manner. With lack of resources, it also has lack of professionally skilled manpower to carry out development in a planned way.

Thus for making this Paurashava a viable urban center, attention should be paid toward cost-effective development of all of its required infrastructure in phases, with the help of professionally skilled manpower and utilizing the newly prepared Master Plan as an important tool for all sorts of development.

CHAPTER 5

REVIEW OF POLICIES, LAWS AND REGULATIONS

5.1 Introduction

The urban planning and land use regulations *per se* are essential for municipal development. They impact on land market favorably or unfavorably and result in social benefits and costs depending on their nature and the specific contexts in which they are applied. Policies, regulations and processes that facilitate availability of land and its uses for planned development at affordable costs need to be continued and those lead to contrary results need to be eliminated or modified.

5.2 Review of Relevant National Policies

The various existing policies, regulations and laws of the country have direct and indirect effects on the preparation and implementation of Master Plans of the Paurashavas in the country. These are briefly reviewed in this chapter to examine their adherence with the Master Plans of the Paurashavas.

5.2.1 Directives of the Local Government (Paurashava) Act, 2009 for Preparing the Master Plan

The Paurashava Ordinances at different times since 1960's till the present time have iterated that a Paurashava as it gets established must prepare its Master Plan for planned development of the municipal town. So far, three ordinances have been made in the year 1967, 1977 and 2008, all suggesting for planned development. The Paurashava Ordinance 2008 was later modified and enacted as Local Government (Paurashava) Act, 2009 in the national Parliament on 6, October, 2009.

This made provision for having the Master Plan prepared by a Paurashava within five years of its inception. The Master Plan of a Paurashava town is aimed for ensuring planned development, and should include the following:

- Survey of history, detailed statistical information, public service activities and other mentioned subjects of the Paurashava;
- Development, extension and upgradation of any area within the Paurashava; and
- Control and regulation of development of any land, any building construction and renovation within the Paurashava.

Actions Suggested in the Act to Prepare Master Plan

The Local Government (Paurashava) Act, 2009 suggests for having qualified Town Planner in its Organogram of Manpower to undertake the job of preparing the Master Plan of the Paurashava. Until such qualified Town Planner is not available in the Paurashava, the Paurashava may require a competent national government authority to prepare such plan for the Paurashava. The Act also makes it contingent to form a Town

Planning Committee within the capacity of its manpower to execute the Master Plan of the Paurashava Town.

Kaliganj Paurashava has no Town Planner and Town Planning Committee at the moment. This makes the Paurashava dependent on having the Master Plan currently being prepared by LGED.

5.2.2 National Land Use Policy 2001

To safeguard the use of its land resources, particularly the valuable agricultural land of the country, the government in 2001 declared the National Land Use Policy. The policy proposed for the preparation of national land use plan, which is very much relevant to the current plan of the Paurashava.

The land use plan is to be based on the criteria of land productivity, land capability and land suitability, use and requirement of land by agriculture, forestry, industrialization, urbanization and housing. Following are the key issues of the national land use plan:

- Execution of coordinated land conservation programs aimed at prevention of desertification and weathering of land, conservation of land fertility, development and conservation of land.
- Prevention of destroying the landscape by earth cutting, excavation and removal of land.
- Formulation and effective execution of Land Use Plan in order to ensure planned use of land.
- Payment of compensation to those who will be affected by land weathering and land acquisition by the government.
- Monitoring, survey and research on desertification, land reclamation, prevention of weathering of land, conservation and development of land and watershed areas.

The policy emphasizes on the planned and the best use of land, and stressed on the most intensive use of this scarce resources of the country. The policy aims to introduce 'land use zoning' based on particular characteristics of land, prevent unplanned expansion of residential areas and control of indiscriminate growth of industrial and commercial activities. In absence of execution, the situation in land use and land management is severely being deteriorated.

5.2.3 National Housing Policy, 1993

The Government of Bangladesh formulated the first ever housing policy of the country in 1993. The priority of the government is to create affordable housing, which might be possible through controlling unplanned and haphazard housing area development. The policy is committed to encourage private developers in land and infrastructure development, and house construction. The policy also made commitment to provide government assistance on participatory housing infrastructure development involving the community, NGOs, CBOs, private developers and social welfare organizations.

The policy declares that in housing activities, the government will continue to remain as a facilitator in housing sector. The government intends to provide housing only to the poor and the rootless classes of the society. The policy makes commitments to encourage private organizations, NGOs and CBOs in housing development, income generation and environmental improvement under local planning. The preparation of Master Plan of the Paurashavas is, therefore, a step forward to address the various development issues including housing for mass people at local level.

5.2.4 Population Policy 2004

Prepared in 2004, the Population Policy of Bangladesh responds to the critical need to deal with the complex national population problem in a holistic way. It aims to build national consensus and synergy among institutions: public, private, civil society and NGOs about the problem.

The objectives of the National Population Policy are to improve the living standard of the people through making a desirable balance between population and development. The Policy proposals can broadly be divided into four sectors, human resources development, decentralization of population activities, participation of NGOs and private sector in population planning. The population policy aims to create a large skilled workforce, emphasizing on education and training strategies.

The policy calls for decentralization of population activities and ensure people's participation through decentralization of services and devolution of power to the local levels. The policy aims to prepare Action Plan through participation of local elites, opinion makers, representatives of poorer section of the society along with the local level government officials. With a view to give a holistic approach, the population policy calls for making the NGOs and private sector as important partners in population activities at various levels.

5.2.5 Transportation Policy 2004

Prepared in 2004, following are the policy objectives of Transport Policy:

- To provide a safe and dependable transport service for all.
- Removal of unnecessary control and formulation of laws and regulations conducive to providing services.
- Fare control and reduction of transport cost of goods for export.
- Determining the roles of the Government sector and the private sector.
- To maintain an economic and environmental balance.
- To ensure maximum utilization of Government funds.
- Expansion of the role of transport in the ever increasing economic activities.
- Growth of traffic commensurate with economic development.
- Introduction of an integrated transport system and provision of alternate transport systems.

The aim is to encourage greater private sector participation with national ownership of road and rail infrastructure. Lease of infrastructure may be allowed on long term basis. The Government is interested to establish a user role within its transport planning process. The Government intends to make arrangements to realize the cost of transport operation and road maintenance from road users through new fiscal policies and protect public interests. The Government will regulate tariffs for passenger and goods both in road and rail transport.

5.2.6 National Environment Policy 1992

Government declared an environmental policy in 1992 with a view to safeguard the national environment. The main objectives of the policy are:

- To promote natural balance and overall development by means of conservation and development of environment.
- To save the country from natural disaster.
- To identify and control all sources of pollution and degradation.
- To ensure environment friendly development in all sectors.
- To ensure sustainable, long term and environment friendly use of all national resources.
- To get involved with all international initiatives on environmental issues.

The comprehensive environmental policy covers as many as 15 sectors of development namely, agriculture, industry, health and health promotion, energy, water resources, flood control and irrigation, land, forest, wild life and biodiversity, fish and animal resources, food, coastal and maritime environment, transport and communication, housing and urbanization, population, education and public awareness, science, technology and research, legal framework, institutional structure. The consultant highlights only those sectors that have relevance to urban development and planning.

Industrial Sector

The following environmental measures are important:

- Potential polluting industries must incorporate control measures in its set up.
- All industries must conduct EIA and take pollution control measures.
- All industries in residential areas to be gradually shifted and new locations to be identified for planned industrial development.
- The industries producing pollutants should have their own system of pollution monitoring.
- Recycling of waste in order to reduce the volume of waste.
- Safeguard health of industrial workers.

Health Sector

The following environmental issues are important:

- Supply of safe drinking water in the Paurashava area and introduction of low cost healthy sanitation system.
- Control of pollution in all kinds of water bodies by municipal, industrial and toxic materials.
- Ban on carrying waste during day time and in open garbage trucks.
- Steps to be taken to protect public health and environment from all activities harmful for human health.
- Inclusion of environment in the academic syllabi.

Energy Sector

The following are some relevant policies:

- Large scale for introduction of improved cooker and wide dissemination of the technology to conserve energy and save environment.
- Promotion of biogas, solar energy, mini hydroelectric unit and wind mill as sources of energy.
- Take up measures to reduce the amount of harmful elements in fuel including, sulfur in diesel and lead in petrol.
- Care has to be taken so that use and transformation of primary and commercial energy does not create any adverse impact on the environmental balance.
- Appropriate measures have to be taken during extraction and distribution of different natural resources like, oil, gas coal, peat so that they do not create any adverse impact on air, water, land, hydrological balance and the eco-system.
- Care has to be taken during giving fitness certificate to vehicles that emit black smoke. Mobile courts will have to be arranged to enforce the relevant legal provisions.

Transport and Communication Sector

The important aspects are:

- Care to be taken to make the road infrastructure development congenial to environment and the development of roads does not impede drainage of water.
- Appropriate measure to be taken so that the passengers and the transport do not endanger public health by indiscriminate throwing of solid waste and defecation.
- The rail, road and water transport must adopt measures to control emission of excessive black smoke.
- Creation of public awareness about the effect of pollution of river water.
- Control on water pollution to be ensured in inland river ports and dockyards.
- Encourage railway rolling stocks that generate less pollution.
- Forestation on both sides of railways and roads.

Population Sector

The important aspects are:

- Conduct study on the impact of population growth on environment and take appropriate measures to mitigate the problems of population growth.
- Prepare manpower utilization plan to make planned and effective use of human resources congenial to environment.
- Emphasize participation of women in environment conservation.
- Appropriate measures are needed to safeguard health of the poor and save them from the adverse effects of environmental degradation.

5.2.7 Industrial Policy 2005

The key aspects of the Industrial Policy 2005 are to:

- Set up planned industries considering the real domestic demand, prospect of exporting goods abroad, and discouraging unplanned industries in the light of the past experience.
- Accept private initiatives as the main driving force of economic development and uphold the government's facilitating role in creating a favourable atmosphere for private investments.
- Take necessary initiatives to establish industries on state initiative in those sectors that are considered very important and essential, where private entrepreneurs are not forthcoming.
- Cater to the needs of consumer satisfaction of the local products; measures to be undertaken to: produce quality products, diversify goods, and provide support for enhancing productivity using appropriate and advanced technology.
- Provide inspiration for the speedy expansion of cottage industries and SMEs, and for further investment in these sectors so that new employment opportunities are generated, unemployment reduced and poverty alleviation programs made available.
- Prioritize the expansion and development of agro-based and agricultural processing industries, and assist in the expansion of poultry, dairy and goat-sheep industry as agricultural industries.
- Provide women entrepreneurs with all necessary assistance in establishing industries in various sectors.
- Provide all necessary assistance for producing environment-friendly product with the objective to creating a pollution-free environment in the industrial sector.
- Enrich the industrial sector with the proper utilization of various natural and mineral resources.

5.2.8 National Tourism Policy 1992 and 2010

Recognizing the contribution of tourism to the socio-economic development of the country, the government framed the National Tourism Policy in 1992. The government in a gazette

notification in May 2010 declared that the government may declare any potential site as a tourist area and if declared so, any development within the area will require formal permission from the government. The attractions of tourism can be varied, and the major policy thrusts for the sector are:

- To create interest in tourism among the people
- To preserve, protect, develop and maintain tourism resources
- To take steps for poverty-alleviation through creating employment
- To build a positive image of the area concerned
- To identify sectors for private capital investment
- To arrange entertainment and recreation
- To strengthen solidarity and integrity among the peoples

5.2.9 Agriculture Policy 1999

Agriculture Policy of Bangladesh was framed in 1999. A new policy is currently under preparation. The following are the important considerations in the 1999 Agriculture Policy.

The major issues dealt within the policy are, seed, fertilizer, irrigation, pest management, agricultural research, extension services, marketing of agro-products, land use, education and training, environment and agriculture, women and agriculture, coordination of various agencies engaged in agricultural development. Most of these issues are not relevant to the current Master Plan. The only relevant issue is the land use. So, review has been carried out on the land use only.

The Policy stresses on all possible steps to ensure optimum use of land. Its use has to be compatible with the overall goals of socio-economic services and utility provisions. The policy targeted to take the following steps to ensure planned utilization of land:

- Land zoning programme will be taken up by the Soil Resources Development Institute (SRDI) on a priority basis. Integrated approach of SRDI will be further strengthened for this purpose.
- To ensure maximum utilization of land, bottom up planning through people's participation will be started from the mouza or village level.
- Measures can be taken to stop fertile agricultural land being used for non-agricultural purposes, such as private construction, house building, brickfield, etc.
- Acquisition of land in excess of requirement for non-agricultural purposes will be discouraged.

About one percent of agricultural lands are being converted into non-agricultural use every year. In a country of constantly growing population, withdrawal of land from agriculture will affect food production. So it is necessary to safeguard farm land from conversion. But this vital issue has been partially addressed in the policy. It states only about fertile land and not agricultural in general.

Government has not framed any effective mechanism to discourage acquisition of land in excess of requirement for non-agricultural purpose. To protect agricultural land, immediate

steps are necessary to delineate agricultural lands. This issue has not been covered in the policy. It has been found that large areas of agricultural lands are unnecessarily being included within Paurashava. Sometimes, it is about 70% of the total Paurashava area.

5.2.10 Urban Forest Policy 1994

Representing an amendment of the forest policy of 1979, current national forest policy was enacted in 1994 and officially announced on 31st May 1995. The policy was formulated to initiate a 20-year Forestry Master Plan (FMP). The plan provides a framework for optimizing the forestry sector's ability to stabilize environmental conditions and assist economic and social development. Three imperatives were identified: sustainability, efficiency and people's participation. Important objectives are:

- To afforest about 20% of the total area of the country by initiating various afforestation programmes in forest lands, fallow lands, lands not useful for agriculture, hinter lands and other possible areas to meet the basic needs of the present and future generations and to ensure greater contribution of the forestry sector to economic development;
- To enrich biodiversity in the existing degraded forests by conserving the remaining natural habitats of birds and animals.
- To strengthen agriculture by extending assistance to those sectors related with forest development, especially by conserving land and water resources.
- To provide for and implement a forestation programmes on both public and private lands.

The policy statements which are most relevant to local participatory forestry are as follows:

- tree growing by communities, local groups or individual families on roadsides, windbreaks, canal/river banks and other public or marginal lands will be promoted through NGOs and relevant state agencies;
- Buffer zones attached to protected areas may be allocated for tree farming and agro-forestry on a long term lease basis;
- The State will provide technical assistance and financial support to promote all forms of homestead forestry;
- Cottage and small scale labor intensive industries, which contribute to the local economy and process wood and other forest based raw materials, will be promoted;
- The traditional rights of people living within and adjacent to designated forest areas will be maintained and their forest-related cultural values and religious beliefs will be respected.

5.2.11 National Plan for Disaster Management, 2008-15

National Plan for Disaster Management 2008-2015 is an outcome of the national and international commitments of the Government of Bangladesh (GoB) for addressing the disaster risks comprehensively. The plan is developed to reduce the vulnerability of the

poor to the effects of natural, environmental and human induced hazards to a manageable and acceptable humanitarian level. The objectives of this Plan are to:

- Align the strategic direction of disaster management programs with national priorities and international commitments.
- Articulate the vision and goals for disaster management
- Outline the strategic direction and priorities to guide the design and implementation of disaster management policies and programs.
- Create a cohesive and well-coordinated programming framework incorporating government, non-government and private sector.
- Ensure that disaster management has a comprehensive and all-hazards focus comprising disaster risk reduction and emergency response.
- Illustrate to other ministries, NGOs, civil society and the private sector how their work can contribute to the achievements of the strategic goals and government vision on disaster management.

A holistic approach for disaster management has been emphasized to work together with all the stakeholders and build strategic, scientific and implementation partnerships with all the relevant government departments and agencies, other key non-government players including NGOs, academic and technical institutions, the private sector and the donors. The role of Government is mainly to ensure risk reduction and comprehensive disaster management.

5.2.12 National Plan of Action for Person's with Disabilities (PWDs) as well as Autism, 1995

In line with the Government policy the Department of Social Services under the Ministry of Social Welfare has an enthusiastic vision & mission to address the social issues relating to Person's with Disabilities (PWDs) as well as Autism. The National policy for the persons with disability, 1995 calls for social protection and ensured the rights of the vulnerable groups. In the recent time, dynamic and sustainable steps have been taken for the PWDs. The steps are:

- To establish separate ticket counters in railway station, bus terminals, river ports, steamer terminal, airport and airways office to facilitate easy availability of tickets for the PWDs.
- To maintain reserve seats in the bus, train and water transports for PWDs.
- To fill up 10 percent reserved quota for employment in government jobs by orphans and PWDs.
- To construct a ramp in all the government offices to facilitate easy movement of the PWDs.
- To withdraw the existing restrictions regarding appointment of PWDs in the Govt. class I & class II jobs, and arrange micro-credit for PWDs by all the Nationalized Commercial Banks (NCBs).

5.2.13 Review of Relevant Laws and Regulations

5.2.13.1 The Act (36 of 2000) for Conservation of Play field, Open space, Park and Natural Water Reservoir in Mega City, Divisional Town, District Town and Paurashavas of Bangladesh

According to the section 5 of the Act, any land having such use as play field, park and natural reservoir cannot be changed or cannot be used for any other purpose(s). However, in absence of Paurashava Master Plan, the Act cannot be properly applied. This emphasizes upon having Master Plan for each Paurashava.

In the existing provision of the Act, any person violating the Act may be liable to punishment up to 5 years of imprisonment or Tk. 50,000 fine or both. The Act makes a provision for appeal, however, and any land owner having any land with above mentioned use may apply to the appropriate authority to have permission to change the use. The authority shall convey the results of appeal within 60 days of the appeal.

5.2.13.2 Bangladesh National Building Code (BNBC) 1993

The Bangladesh National Building Code (BNBC) 1993 was formulated in 1993, but given legal status in 2008. The purpose of Bangladesh National Building Code (BNBC) is to establish minimum standards for design, construction, quality of materials, use and occupancy, location and maintenance of all buildings in order to safeguard within achievable limits, life, limb, health, property and public welfare. It aims to insure public safety, health, and general welfare in so far as they are affected by the construction, alteration, repair, removal, demolition, use or occupancy or buildings, structures of premises, through structural strength, stability, means of egress, safety from fire and other hazards, sanitation, light and ventilation. The BNBC suggests for conservation and restoration of historic buildings.

5.2.13.3 The Building Construction Act 1952

This Act was prepared in 1952 to prevent haphazard construction of buildings and excavation of tanks that are likely to interfere with the planning of certain areas in Bangladesh. The Act is usually exercised in areas under the urban local governments. The Act sets some conditions regarding construction of buildings in urban areas, where the Act will be in execution.

Preparation of Master Plan

The Act calls for preparation of a Master Plan of the urban area concerned before approval of building plan. The Master Plan shall show the future land use of the area through land use zoning. The buildings will be approved according to the land use provisions of the zoning plan. Having a Master Plan prepared, a Paurashava has the scope of exercising the following provisions/actions:

Building Construction Rules

The Act in its Section 18 keeps provision for preparation of Building Construction (BC) rules to ensure healthy and environment friendly building development. The last BC Rules

were prepared in 1996. However, due to special characteristics of building development in Dhaka city a separate set of BC Rules was prepared for Dhaka City in 2008 under the same Act.

Power to Removal of Construction (Section 3B)

The Act gives special power to plan approval authority to remove any building that did not follow the specified rules of the Act or take action against any building owner who constructs building violating the rules after approval of the building plan.

Removal of Unauthorized Building (Section 7)

The Act empowers the authority to remove any building that has been built violating the BC rules. On failure to do so, the authority itself shall dismantle it and the entire cost shall be recovered from the owner as public demand.

Appeal

The Act, however, keeps provision for appeal, if the owner finds himself aggrieved due to any action by the authority.

Observation on the Building Construction Act

For appropriate execution of the Act, there is necessity of having Master Plan for a Paurashava. At the moment, there is serious lack of monitoring of disobedience of rules by the builders. Once the Master Plan is made for a Paurashava Town, the Paurashava Authority will be able to follow the rules properly.

5.3 Applicability of the Acts, Regulations and Policies in the Paurashava Master Plan

The key aspects of the policies presented in this Chapter have both direct and indirect relationships with the preparation of Master Plan of Paurashava Town in general, and Kaliganj Paurashava in particular. The Local Government (Paurashava) Act, 2009, the Building Construction Act 1952, the BNBC, the Conservation Act 2000, Agriculture Policy etc. have serious stakes in the execution of Paurashava Master Plan. The other policies also have relevance in the preparation of Master Plan for an Urban Centre. As a result, the relevant aspects of the Acts, rules, and policies are mentioned in this chapter and are taken into consideration in the preparation of the Master Plan for the Paurashava. The key aspects that are most relevant with the preparation of Paurashava Master Plan are shown in Table 5.1.

Table 5.1: Important provisions of different Acts, Policies and Rules having relevance with the preparation of Paurashava Master Plan

Act/Ordinance, Policies, Rules	Relevance with Paurashava Master Plan
Local Government (Paurashava) Act, 2009	Makes provision for having a Master Plan of the Paurashava Town. Provides legal basis for the preparation and implementation of Paurashava Master Plan. Suggests on the content and structure, and other relevant issues, such as provision for qualified Town Planner in the Paurashava staff.
National Land Use Policy 2001	Formulation and effective execution of Land Use Plan in order to ensure planned use of land. Suggests for afforestation, conservation and development of

Act/Ordinance, Policies, Rules	Relevance with Paurashava Master Plan
	land maintaining landscape.
National Housing Policy, 1993	To create affordable housing through controlling unplanned and haphazard housing area development. To encourage private developers in land and infrastructure development, and house construction. Participatory housing infrastructure development involving the community, NGOs, CBOs, private developers and social welfare organizations.
Population Policy 2004	To improve the living standard of the people through a desirable balance between population and development. The proposals are divided into four sectors - human resources development, decentralization of population activities, participation of NGOs and private sector. The policy aims to create a large skilled workforce providing education and training.
Transportation Policy 2004	To provide a safe and dependable transport service for all. Removal of unnecessary control and formulation of laws and regulations conducive to providing services, determining the role of public and private sectors, maintaining an economic and environmental balance, maximum utilization of Government funds and introduction of an integrated transport system and provision of alternate transport systems.
National Environment Policy 1992	To promote natural balance and overall development by means of conservation and development of environment, save an area from natural disaster, identify and control all sources of pollution and degradation, ensure environment friendly development in all sectors, ensure sustainable, long term and environment friendly use of all national resources, and get involved with international initiatives on environmental issues.
Industrial Policy 2005	To set up planned industries considering the real domestic and export demand discouraging unplanned industries, provide necessary assistance for producing environment-friendly products with the objective of creating a pollution-free environment, and enrich the industrial sector with the proper utilization of various natural and mineral resources. To prioritize the expansion and development of agro-based and agricultural processing industries, and assist in the expansion of poultry, dairy and goat-sheep industry as agricultural industries; and provide women entrepreneurs with all necessary assistance in establishing such industries.
National Tourism Policy 1992 and 2010	To create interest in tourism among the people, preserve, protect, develop and maintain tourism resources, take steps for poverty-alleviation through creating employment, build a positive image of the area concerned, arrange entertainment and recreation, identify sectors for private capital investment, and strengthen solidarity and integrity among the peoples.
Agriculture Policy 1999	To strengthen land zoning program, ensure maximum utilization of land through bottom up planning and people's participation, stop fertile agricultural land being used for non-agricultural purposes, and discourage acquisition of land in excess of requirement for non-agricultural purposes.
Urban Forest Policy 1994	To afforest about 20% of the total area of the country by initiating various afforestation programs in forest lands, fallow lands, lands not useful for agriculture, hinter lands and other possible areas to meet the basic needs of the present and future generations and to ensure greater contribution of the forestry sector to economic development; enrich biodiversity in the existing degraded forests by conserving the remaining natural habitats of birds and animals; Strengthen agriculture by extending assistance to those sectors related with forest development, especially by conserving land and water resources; and implement afforestation programs on both public and private lands.
National Plan for Disaster Management,	To align the strategic direction of disaster management programs with national priorities and international commitments,

Act/Ordinance, Policies, Rules	Relevance with Paurashava Master Plan
2008-15	articulate the vision and goals for disaster management, outline the strategic directions and priorities to guide the design and implementation of disaster management policies and programs, create a cohesive and well-coordinated programming framework incorporating government, non-government and private sector, and ensure that disaster management has a comprehensive and all-hazards focus comprising disaster risk reduction and emergency response.
National Plan of Action for Persons With Disabilities (PWDs) as well as Autism, 1995	To establish separate ticket counters in railway station, bus terminals, river ports, steamer terminal, airport and airways office to facilitate easy availability of tickets for the PWDs, fill up 10 percent reserved quota for employment in government jobs by orphans and PWDs, construct a ramp in all the government offices to facilitate easy movement of the PWDs, and withdraw the existing restrictions regarding appointment of PWDs in the Government Class I & class II jobs.
The Act (36 of 2000) for Conservation of Play field, Open space, Park and Natural Water Reservoir in Mega City, Divisional Town, District Town and Paurashavas of Bangladesh	To protect the existing use of land such use as play field, park and natural reservoir, and ensure punishment for conversion of such lands by any person/authority without proper permission from the appropriate authority.
Bangladesh National Building Code (BNBC) 1993	To establish minimum standards for design, construction, quality of materials, use and occupancy, location and maintenance of all buildings in order to safeguard within achievable limits, life, limb, health, property and public welfare. It aims to insure public safety, health, and general welfare in so far as they are affected by the construction, alteration, repair, removal, demolition, use or occupancy of buildings, structures of premises, through structural strength, stability, means of egress, safety from fire and other hazards, sanitation, light and ventilation. The BNBC also suggests for conservation and restoration of historic buildings.
The Building Construction Act 1952	The Act calls for preparation of a Master Plan of the urban area concerned before approval of building plan. The Master Plan shall show the future land use of the area through land use zoning. The buildings will be approved according to the land use provisions of the zoning plan. To ensure healthy and environment-friendly building development. To empower special power to remove any building that did not follow the specified rules of the Act.
The Building Construction Act 1952 (Continued)	To take action against any building owner who constructs building violating the rules after approval of the building plan. To forbid cutting of any hill without prior permission of appropriate authority. To keep provision for appeal, if the owner finds himself aggrieved due to any action by the authority.

CHAPTER 6

PROJECTION OF FUTURE GROWTH UPTO 2031

The future growth projection is helpful to draw mechanisms for improving and guiding long-term development strategies, identifying existing problems and future demand and making possible suggestions, to formulate viable projects for urban development and increase management capabilities of the concerned authority. This chapter incorporates projection of population, identification of economic opportunities and projection of land use for Kaliganj Paurashava.

6.1 Projection of Population

In absence of data for previous census years for Paurashava, it has been difficult task to collect information on population. The detail of how the estimation of population are made, have been discussed below.

Basis of Population Projection Method

Perhaps no single factor is more important for planning than the size and composition of a region's population and the way it will change in the future. Estimating future population for a specific period for a particular area is one of the most difficult tasks in the planning process. For Bangladesh population projection is a very difficult task as the required data are not available for particular area and same is the case for Kaliganj.

On the other hand, the difference of data from different secondary sources also makes the job more problematic. The population figures collected from secondary sources especially for Paurashava were very much ambiguous. So for the final projection, several discussions were made with experts and BBS officials. Following the annual growth rate for the study area available from the 2001 Population Census, the projection up to the year 2031 with five years interval has been made.

To calculate the future population of the area, the following formula is used.

$$P_n = P_o (1 + r)^t \text{ where,}$$

P_o = the base year population (2001)

P_n = the projected year population (2031)

t = time period (20 Year),

r = annual growth rate

Assumptions

The basic objective of the study is to estimate the population of the Paurashava for the year 2001, which would be the base year population. First using the base year population, a projection of the study area population at five yearly intervals up to 2031 is on the basis of some assumptions. In general, the projection is made on the basis of trends in population growth observed in the past, and looking ahead the development prospects in future.

The important issues to be considered are;

- The natural growth;
- Composition of the population, particularly the age breaks;
- Net migration;
- The annexation of new areas with existing town.

Shortcomings

The data found from the several sources is not reliable to be accepted. Because it was found that in different sources the data is also different. When it is calculated for the projection then the output shows the separate result. So, it is the main deficiencies of data obtained from the diverse sources.

Migration information is not available census by BBS. It only considers the natural growth rate. But actual population projection requires both natural growth rate and migration rate. For this unavailability of migration data, population projection becomes very difficult. To avoid this problem, population estimation has done here as alternate of population projection.

Ward wise Projected Population

The population of Kaliganj Paurashava is 45341 in 2011 (BBS, 2011) within an area of 5443.71 acres. According to 2001 Population Census, the population was 36732. With an annual growth rate of 2.60%, the forecasted population of Kaliganj Paurashava will be 75760 in the year 2031. The gross density of the area will be 19 ppa (person per acre). Due to the maximum concentration of residence in Ward no. 06, the density of population will also be higher (68 ppa) in this area. Table 6.1 shows ward wise population distribution of Kaliganj Paurashava based on growth rate.

Table 6.1: Population Projection with Density for Kaliganj Paurashava Up to 2031

Ward no.	Area (In Acre)	2011		2016		2021		2026		2031	
		Pop	PPA	Pop	PPA	Pop	PPA	Pop	PPA	Pop	PPA
Ward-1	696.29	4727	7	5374	8	6110	9	6947	10	7898	11
Ward-2	520.95	5462	10	6210	12	7060	14	8027	15	9126	18
Ward-3	354.62	6245	18	7100	20	8072	23	9178	26	10435	30
Ward-4	281.32	3145	11	3576	13	4065	14	4622	16	5255	19
Ward-5	199.21	8150	41	9266	47	10535	53	11978	60	13618	68
Ward-6	552.55	2763	10	3141	11	3572	13	4061	14	4617	16
Ward-7	274.19	6106	22	6942	25	7893	29	8974	33	10202	37
Ward-8	1697.14	3640	4	4138	4	4705	5	5349	6	6082	6
Ward-9	867.39	5103	13	5802	15	6596	17	7500	19	8527	22
Total	5443.71	45341	11	51550	13	58609	15	66635	17	75760	19

Source: 1. BBS, 2001, BBS 2011 & Paurashava. Estimation by the Consultant

Note: Growth rate for Population projection has been considered as 2.60 after the analysis of planning team comparing with the surrounding urban towns' growth of Kaliganj.

6.2 Identification of Future Economic Opportunities

The contribution of the small towns to the economic development of their hinterlands depends largely on the urban development in these urban centers. Depending on transport, communication and storage facilities, this Paurashava can play a vital role in linking rural farmers to the urban market. For instance, development of road network between this small town and its rural hinterlands may greatly benefit rural farmers as it

enables them to transfer their agro produces to bigger markets. The industrial development in the Paurashava will have significant impact on the demand for raw materials that are required for the industrial production. All sorts of production materials, like brick, wood, bamboo etc. are produced in the countryside, serving as supply centers for urban demand. To support urban industries and related activities, it requires adequate infrastructure, such as urban rural transfer routes, communication and information structures. Investments in this projects result in enhanced productivity in both urban and rural areas.

Table 6.2 shows the working force for Kaliganj Paurashava. The total working force of Kaliganj in 2001 was 17362. According to this table and also information from the socioeconomic survey in the Paurashava, further calculation has been done. At present excluding housewives and students from working force, 79.64% is male and rest 20.36% is female. It will be expected that the total figure will rise to 31153 in the year 2031. For a balance development of an area it will be necessary to create employment opportunities for the estimated work force. It will also expect that after the economic upliftment of Kaliganj, the participation of female work force in economic activities should be increased.

Table 6. 2: Projected Working Force for Kaliganj Paurashava up to the Year 2031

Year	Working force(excluding housewife and student)		
	Male	Female	Total
2001	14076	3286	17362
2011	16632	4251	20883
2016	18381	4698	23079
2021	20314	5193	25506
2026	22450	5738	28189
2031	24811	6342	31153

Source: 1. BBS, 2001. & 2011. Estimation by the Consultant

Note: i. Population from the year 15-59 has been considered as working force

ii. 27.58% of the working force has been considered as male student and 80.90% is female housewife& Student.

However, it is extremely difficult to make any precise projection about future economy of this small urban center. Considering the present level of economic activities, no major change is anticipated in the local economy in the near future.

The town has good prospects to local economic raise provided appropriate government policies and initiatives are taken. People have money, but they will have to convert it into capital. The following suggestions may be considered.

First, training on entrepreneurship may be arranged for prospective young and educated entrepreneurs to encourage them to invest in manufacturing, in particular.

Second, local entrepreneurs may go for consumer goods production targeting local market.

Third, prospective investors may also explore possibilities of investment in agriculture sector for local as well as export market, particularly, in fisheries, poultry and horticulture.

To raise the rate of employment and reduce poverty, employment opportunities in the town have to be increased. All these problems and also others not revealed in the findings will have to be addressed in the proposed Master Plan of the Paurashava.

6.3 Projection of Landuse

Projected land use is a critical component to a comprehensive plan. The forecast determines the amount of land needed to accommodate future growth, and includes the land required for residential, commercial and industrial uses. In some instances, a community may have enough vacant lands within its boundary to accommodate its forecasted population increases and land use demands. In other instances, there may be a need to consider land outside a community's boundaries to accommodate this increase. The projection and demand on land requirements as per the planning standard approved by the PMO office of UTIDP project are given in Table 6.3 and detailed are discussed in Part B, Chapter-10 and Section 10.1.2 of this report.

Table 6. 3: Land Use Requirement for Kaliganj Paurashava

Development Consideration	Type of Land Use	Area (acre)	Total	
			Area (acre)	%
Land for Urban Development	Residential Zone	676.39	1246.08	31.59
	Education and Research zone	103.08		
	Open Space	153.81		
	Health Services	23.53		
	Community Facilities	20.41		
	Commercial Zone	74.4		
	Utility Services	16.91		
	Industrial Zone	169.1		
	Transportation Facilities	8.45		
Circulation Network and Reserve Area	Circulation Network**, Agriculture and Water Body		4197.63	68.41
Total Structure Plan Area			5443.71	100

***Maximum 25% of urban development area will be used as circulation network.*

CHAPTER 7

LAND USE ZONING POLICIES AND DEVELOPMENT STRATEGIES

This chapter sets land use policies and development strategies for planning area. It classifies the Structure Plan area into categories and also includes strategies for optimum use of urban land resources, plans for new area development and areas for conservation and protection.

7.1 Broad planning View of Structure Plan

Kaliganj Paurashava is connected with Khulna and Dhaka by railway and road network. This town is divided into four parts by Jhenaidah-Jessore road network and Chitra River which are the main reason to its development. Along with low land within the Paurashava and maximum of this land is in agricultural practice are the other obstacles to quick flourished of this town. Favorable communication system, availability of gas connection and raw materials create ample opportunity for industrial development. Considering these opportunities, growth pattern of the town and also development constrains, an urban livable environment for people irrespective of their socio-economic, demographic and religious background has been suggested. The implementation of Structure Plan of the Paurashava will translate this consideration into reality. The zoning policies and strategies of development in the land use zones have been given due importance for future development of the Paurashava.

7.2 Zone of Structure Plan Area

To guide long term growth within the Structure Plan Area by means of demarcation of the future growth areas and indication of potential locations of major development zones are broadly classified into seven categories. Table 7.1 shows the Structure Plan area zones, its area and percentage coverage. Details of the description of structure planning zones are given in the following paragraphs. Map 7.1 and Appendix-1 shows the structure plan of Kaliganj Paurashava.

Table 7.1: Structure Plan Policy Zoning

Zoning	Description of the Zone	Area (acre)	%
Core Area	This area is also known as built-up area. This is defined as the area which has the highest concentration of services; it also has the highest population concentration and density. It will absorb most population growth during the Land use Plan (2011-2021) period.	214.89	3.94
Peripheral Area	This is the zone where a slow trend of urbanization is continuing in Unplanned manner. The area identified in the Structure Plan as the likely choice for new urban development beyond the core area. Ideally, it might be reasonable to provide primary infrastructure networks in this area to foster development and encouraged to enable a more rapid urbanization in a planned way.	643.80	11.82

Zoning	Description of the Zone	Area (acre)	%
New Urban Area	This zone will be the required additional area for future planned urban development as per population projection. New facilities and services like road, drains, footpath, waste transfer station and other civic services will be provided. This area is proposed to grow within 2031.	1188.02	21.82
Agriculture	Agricultural land (also agricultural area) denotes the land suitable for Agricultural production, both crops and livestock. It is one of the main resources in agriculture. The land under annual crops, such as cereals, other technical crops, potatoes, vegetables, and melons; also includes land left temporarily fallow; land under permanent crops (e.g., fruit plantations); areas for natural grasses and grazing of livestock.	2784.68	51.15
Water body	Water body containing an area equals to or more than 0.25 acres excluding those of khal, irrigation canal and river will be treated as this category.	199.03	3.65
Major Circulation	Major circulation contains major road network and railways linkage with Regional and national settings.	405.55	7.45
Total		5443.71	100

7.2.1 Core Area

Total 214.89 acres of land, which covers 3.94% of Structure Plan area, is declared as Core Area (Map 7.1). It is located within Ward no. 1, 2, 3, 4, 5 and 7. It includes the highest concentration of service area for an example Paurashava Office, Upazila complex, schools, post office, police station, Kaliganj Bazar area and other governmental offices and it has the highest potentiality of development. Because the town developed based on the Kaliganj Bazar, which is located on the center of Paurashava and also both side of the River Chitra. Besides major roads namely Jhenaidah- Jessore road, Paurashava road passes within this area. There are differences in levels of provision in this area, particularly between the formally developed and planned areas and the majority of unplanned areas. Levels of provision should be maintained in the planned areas. Since these areas are forecasted to show density increase and increased demand and therefore will require regular upgrading. The main thrust to improve services should be in the unplanned zones, particularly where the deficiencies already are great and quality of life will sharply decline when the services also have to cater for the additional population.

7.2.2 Peripheral Area

A total of 643.80 acres of area, which covers 11.82% of Structure Plan area, is declared as Urban Peripheral Area (Map 7.1). Maximum peripheral area is in Ward nos. 1, 2, 4, 6, 8 and 9 in North West and South West corner of the Paurashava. This zone is developing areas that will take a longer time to reach the population densities of the urban core area. Low initial densities in these areas do not justify supply of a full range of services as they will initially be underused. However, it is essential that planning and reservation of rights of way, at least for primary networks, be undertaken soon to enable provision when justified by increased density levels and allowed by resources.

7.2.3 New Urban Area

Total 1188.02 acres of land covering 21.82% of Structure Plan area is declared as New Urban Area (Map 7.1).

New urban area is mainly proposed on Ward no. 1, 2, 3, 4, 5, 6, 7, 8 and 9 which is to be proposed as a residential area in future. It is assumed that town will be developed based on establishment as a trade center which mostly depends on successful utilization of the road network with other urban areas and surrounding unions. So most of the new urban lands in Ward no. 09, 04 and 03 will be used to meet the extra pressure of development in this Paurashava. A large portion of land in Ward no. 05 will be used to establish a new residential area for future planned urban development as per population projection.

Map 7.1: Structure Plan Zone of Kaliganj Paurashava

7.2.4 Agriculture

Total 2784.68 acres of land covering 51.15% of Structure Plan area is declared as Agriculture Area (Map 7.1). Northern and Eastern portion of the Paurashava is mostly declared as agriculture area. There has been also agricultural land in southern portion of the Paurashava.

7.2.5 Water body/Retention Area

Total 199.03 acre area, which covers 3.65% of Structure Plan area, is declared as water body (Map 7.1). It includes 310 ponds, 3 Khals, 186 ditches, and 1 river with an area equal to or more than 0.15 acre and all the canal and river within the Paurashava. More detail information is provided in drainage and environmental plan in Chapter 12.

7.2.6 Major Circulation Network

It contains major road network with Jhenaidah, Jessore and other neighbouring urban centers and also includes the major road way network required for maintaining existing internal communication. Total 405.55 acres of land which covers 7.45% of total structure plan area. Map 7.1 shows major circulation network.

7.3 Strategies for optimum use of Urban Land Resources

7.3.1 Optimum use of Urban Land Resources

With a limited land mass, Bangladesh is the most densely populated country in the world. The land area of the country remains static amid continuously increasing population. Such a situation calls for strict regulation to utilize its scarce land resources for non-agricultural purposes. Increase in urban population means more demand for houses, roads, schools, hospitals, factories, bazars, shops, business centers, offices, other service facilities etc. Providing all these facilities require land and that is at the cost of valuable agricultural land, as the country has hardly any fallow land to accommodate all these land uses. Kaliganj Paurashava is surrounded by valuable fertile agricultural land. Any urban expansion will cost net deduction of agricultural land that will consequently affect local food and cash crop production. Practice of thriftiness on land utilization is, therefore, essentially needed in plans and development proposals. Such practice should start through adoption of conservative and rational standards of space use and their proper application in planning, designing and development. Table 7.2 shows the optimum use of urban land resources.

Table 7. 2: Policy for optimum use of urban land resources

Policy	Justification	Means of Implementation	Implementing Agency
<u>Policy UA/1: Optimization of Available Land Resources</u> Growth within the established urban area is not compact in Kaliganj. There are still large amount	Keeping large land areas vacant within the existing built up area, extension of physical boundary of the town is not logical. Such a tendency might cause valuable agricultural land out of use. There is a need to economize the use of land, which is a scarce resource	Control: Imposition of tax on the land remaining vacant for a long time can be tried to discourage speculation on the land use practices. Measures should be	- Kaliganj Paurashava; - Ministry of Land

Policy	Justification	Means of Implementation	Implementing Agency
of land lying vacant amid all categories of land uses within the Paurashava area and beyond. Infilling of these lands should be promoted and encouraged to optimize use of land.	against an expanding population in the country.	adopted to minimize the use of land by public sector agencies. Policies to discourage large scale land acquisition for development by the public sector can be tried. Promotion: The public sector should develop infrastructure facilities and services in deprived areas to enable the land owners for development.	
Policy UA/2: <u>Utilization of Khas Land for Urban Development</u>	Khas lands are public land that should be made best use for community purpose. Instead of evicting people from their own land for implementing development proposals, khas land should be used as much as possible.	Taking over of khas land by Paurashava that falls under different development proposals under the current development plan. Paurashava can later on hand over the land to the concerned authority that will implement the particular development proposals.	- Kaliganj Paurashava - Ministry of Land - DC, Jhenaidah

7.3.2 Plans for New Area Development

Table 7.3 shows policy to develop new urban area. It includes justification of new area development, means of implementation and agencies for implementation.

Table 7. 3: Policy for new area development

Policy	Justification	Means of Implementation	Implementing Agency
Policy ua/3: initiatives for new urban area development	New areas with their growing stage offer excellent opportunity for organized development with little or no compensation cost for eviction and less hindrances in motivation of the local residents in favor of organized development	Participatory approach to new urban area development is to be supported by innovative ideas of spatial development. Long motivational activities will have to be carried out for this purpose. Public sector with technical and financial support of the private sector and cooperation from service giving agencies will make the task easier.	- Kaliganj Paurashava - DPHE - Private sector.

7.3.3 Areas for Conservation and Protection

To ensure livable environment in the planning area, different areas are conserved in various forms, namely agricultural land, low land, pond and natural drainage, green belt, historic and heritage areas etc. Details are given in Table 7.4.

Table 7. 4: Area for conservation and protection

Type of Land	Means of Implementation	Implementing Agency
Loss of Productive Agricultural Land: The master plan area has a vast agricultural land in the northern side of this project. After implementation of the project, environment of agriculture will be converted into non-productive urban and semi-urban area.	The EIA Guidelines of DOE emphasized on the avoidance of productive agricultural land for any development project. Therefore, it will be wise to consider more economical use of land to avoid fertile lands. The town expansion and land acquisition should be based on the growth rate of population. According to population projection for the year 2031, the present residential land use area will grow with increasing density. So a large share of agricultural land can be spared at least for the time being.	- Kaliganj Paurashava - DOE.
Low Land, Pond and Drainage Path: All the khals, rivers ponds and ditches with an area equal to or more than 0.15 acre within the Paurashava are declared as retention area. In no way permission for filling up of these ponds should be given. Paurashava should acquire these ponds at suitable time to use them for retention and emergency use.	This area is declared as water body in the Master Plan. As per the guideline of Wetland Conservation Act 2000, this area will be conserved as water body. According to population projection for the year 2031, the present residential land use area can be developed with increasing density up to this year. So a large share of water body can be spared.	- Kaliganj Paurashava - Water Development Board

7.4 Policies for Development

This section of the chapter sets forth strategies and policies for various components of the Master Plan on sector basis.

7.4.1 Policies for Socio-economic Sector

Population

Controlling population should be given utmost importance nationally, as because of the uninterrupted population growth, the country's economic problems are being accentuated, pressing on its resources. It makes poverty reduction difficult, which is the key to overall national development. It is, therefore, necessary to enhance population control drive. The people at the grassroots can play an effective role in this regard. An efficient, well trained and well paid grassroots level work force can help profoundly in achieving the targets of population control policy of the government. Side by side, promotion of education can be very effective in the creation of awareness about small family size. The Paurashava may undertake relevant measures in line with national objectives to strengthen its own position in population planning.

Strategy:

- Raise the level of education among mass people and emphasize more on grassroots level family planning workers' services with effective delivery of birth control services.

Table 7. 5: Policy for Population Sector

Policy	Executing Agency
<p>Popu/1: Declaring population as one of the most critical sectors of national development. Prediction of population growth should be reviewed from time to time, in the light of new evidence, to track the new trends in migration, age and income structure</p> <p>Justification: Per capita national growth is being eaten up by constantly growing population. By controlling population, national benefits earned from economic growth can be shared in a better way, raising the level of living standard of the people.</p>	<ul style="list-style-type: none"> - Ministry of Planning - Ministry of Health and Family Planning
<p>Popu/2: Putting more efforts and resources in raising the level of education.</p> <p>Justification: Education would not only create awareness among the masses about the benefits of small family size, it will also help secure better job with higher pay that would reduce poverty.</p>	
<p>Popu/3: Creation of well-paid and well trained grassroots level family planning workers for motivational work.</p> <p>Justification: Grassroots level workers can give door to door motivational services and distribute birth control materials in a better way. To get good services they must be efficient and well paid.</p>	<ul style="list-style-type: none"> - Ministry of Planning - Ministry of Health and Family Planning - Ministry of Women and Children Affairs
<p>Popu/4: Expected population growth and changes in its socio-economic and age-structure should be taken into account for future development initiatives</p> <p>Justification: Prediction of population growth should be reviewed from time to time, in the light of new evidence, to track the new trends in migration, age and income structure.</p>	
<p>Popu/5: Initiatives should be taken for rational distribution of population within the Structure Plan area through making land available by ensuring infrastructure facilities, housing and community facilities</p> <p>Justification: To ensure rational distribution of population within the planned area is one of the main objectives of the development plan. This distribution of population has to be in relation to the availability and suitability of land and other urban activities.</p>	<ul style="list-style-type: none"> - Ministry of Planning - Ministry of Health and Family Planning

Economic Development and Employment Generation

Economic development of any place is associated with generation of employment. The generation of employment depends on the rate of investment in various sectors of an economy. An urban economy of any town starts building up with investment in the basic sector that leads to the building up of the non-basic sector. Investment in basic sector is not very bright in Kaliganj as it is a very small town with a very small size of population. Besides, it has to compete with other adjoining urban centers like Koatchandpur, Shailakupa and larger towns, like Jessore and Jhenaidah. These urban centers are counter magnets of investment. However, the Paurashava must ensure that any foreseeable opportunity in economic development is given due attention for its own growth and economic benefits.

Strategy:

- Creating basic sector investment climate and leading the local economy forward through promotion of Small and Medium Enterprises (SME).

Table 7.6: Policy for Economic Development and Employment Generation

Policy	Executing Agency
<u>Econ/1:</u> Promotion of regional agriculture.	<ul style="list-style-type: none"> - Ministry of Agriculture - Bangladesh Agricultural Development Corporation (BADC) - Ministry of Industries - Ministry of Commerce
Justification: Promotion of agriculture would help raising income and savings. The main objective of agriculture sector will be to increase production and simultaneously ensure value addition.	
<u>Econ/2:</u> Developing Agro based Industries and Markets to Paurashava Area.	<ul style="list-style-type: none"> - Bangladesh Agricultural Development Corporation (BADC) - Ministry of Industries - Ministry of Commerce
Justification: Due to existence of available agricultural land, the land may be used for different agricultural production and those productions may be used for the input of agro-based industries. Again the Upazila is renowned for Maze and Vegetables based cultivation. An industrial estate and Trading Centre based on those raw agro-products may be established in the Paurashava area.	
<u>Econ/3:</u> Taking of measures to channelize remittance to value adding productive sectors.	<ul style="list-style-type: none"> - Ministry of Expatriates' Welfare and Overseas Employment - Ministry of Labour & Employment - Ministry of Industries - Ministry of Commerce
Justification: Larger amount of remittance is being diverted to land purchase, which is considered as the safest investment. This huge capital may be diverted to productive sectors to help create more employment.	
<u>Econ/4:</u> Arranging entrepreneurship training programmes for prospective investors.	<ul style="list-style-type: none"> - SME Foundation - Ministry of Labour & Employment - Ministry of Industries - Ministry of Commerce
Justification: There are many potential investors who are ignorant of the ways and means of investment and operation of an enterprise. The training can help them get educated in these lines.	
<u>Econ/5:</u> Provision of bank loans on easy terms to attract prospective investors in the SME sector.	<ul style="list-style-type: none"> - Ministry of Labour & Employment - SME Foundation - Ministry of Industries - Ministry of Commerce
Justification: Easy loans would encourage and attract prospective investors for investment in small scale industries.	

Housing

As the town has low level of population, housing is yet to become a problem here. Housing policy and programmes are provided and executed by the national government. There is no local office of the National Housing Authority to execute housing programmes at Upazila level. As a local government, Paurashava can facilitate housing area development by means of providing road infrastructure, drainage, water supply, etc in designated housing zones. The consultant supports the prevailing national housing policy and advocates its execution at all levels, which at the moment is highly lacking.

Strategy:

- Upholding the role of Paurashava, as a facilitator to provide all necessary infrastructure and services to enable housing by people in general. As a least cost approach, involvement of the land owners can be encouraged in housing area development on a public-private partnership basis.

Table 7. 7: Housing and Slum Improvement

Policy	Executing Agency
Policy House/1: Provision of necessary services and facilities to promote housing at private sector.	<ul style="list-style-type: none"> - National Housing Authority - Ministry of LGRDC - Kaliganj Paurashava
Justification: It is more difficult to provide housing on public sector initiatives, as it involves funding and land acquisition that takes a long time. By providing infrastructure and services, general people can be encouraged to build their own houses.	
Policy House/2: Housing zone land owners can be involved in a participatory development approach, where Paurashava will provide infrastructure and the cost will be shared by land owners.	<ul style="list-style-type: none"> - National Housing Authority - Ministry of LGRDC - Kaliganj Paurashava

Social Amenities and Community Facilities

Social amenities and community facilities include, education facilities, health facilities, open space recreation facilities like, park and playground, amusement park and community centre. For comfortable and healthy urban living, these facilities are the fundamentals. Since these are social services, they must be provided by the public sector agencies as public good. For education and health facilities, the national government has policies and there are separate ministries and their agencies to execute the policies through programmes and projects. There are also Upazila level offices of the concerned agencies to take care of the execution of national education and health policies and programmes. For providing amenities like, park and playground and community centre, the responsibility lies with the Paurashava.

For park and playground, the Paurashava may secure local khas land. The open space recreation is difficult to provide as population expands and land price goes higher. Once time is lost, vacant lands are also lost. Amid soaring land price and absence of vacant land, it becomes extremely difficult to provide open space recreation. So, it is better to secure vacant lands for open space before density of population increases and land becomes scarce and pricier. For community center, intensive use of land should be made by making multiple use of the same space, for example, providing community center, ward councillor's office, clinic or any other use in the same building.

Strategy:

- Exploring khas /public land within the Paurashava and using the unused/vacant land for providing amenities, before density of population increases and land becomes scarce and dearer.

Table 7. 8: Social Amenities and Community Facilities

Policy	Executing Agency
Policy-Amenity/1: Procurement of khas and other public land for park, playfield, community centre.	- Ministry of Land - DC Office, Jhenaidah - Ministry of LGRDC - Kaliganj Paurashava
Justification: Since above facilities are non-revenue earning, they should be procured at least cost.	
Policy-Amenity/2: Land should be procured for open space facilities as quickly as possible, because when land value will be higher, cost of providing the facilities will also be very higher. Besides, with the growth of population, vacant land will disappear gradually, so no land will be available at strategic locations for providing open space facilities.	- DC Office, Sylhet - Ministry of Land - Ministry of LGRDC - Kaliganj Paurashava

7.4.2 Physical Infrastructure Sector

Transport

By far, transport is the most important means to revitalize an urban center. Intra and inter urban transportation facilities create economies of scale for prospective investors and enables easy and comfortable mobility of the residents. Easy and cheaper transportation of raw materials and finished goods create good investment climate for manufacturing enterprises that lead to development of the service sector firms. New employment generates and the non-basic sector expands leading to thriving urban center. To create transportation facilities, quality inter-Upazila and inter-District road network will have to be created that makes movement faster and easy. With good transport infrastructure, economic development may become attractive. Besides, quality of local roads will have to be upgraded to encourage people live in the town. Once population starts increasing, it will expand local consumer market and will attract new investments in consumer goods production.

Strategy:

- Creation of efficient inter-city and intra-town communication for easy transportation of goods and passengers.

Table 7.9: Policy for Transport Sector

Policy	Executing Authority
Policy-Transport/1: Development of efficient inter-city road network with standard road.	- Roads and Highways Department (RHD)
Justification: Increased inter-city mobility will increase business transactions and generate investment and employment.	
Policy-Transport/2: Promotion of efficient road transport facilities between urban centers.	- Bangladesh Road Transport Authority (BRTA) - Jhenaidah District
Justification: Not only that communication is needed between urban centers, but to attract investment, emphasis must be laid on quality of roads built.	
Policy-Transport/3: Development of local road network through participatory approach.	- Kaliganj Paurashava - Local Government Engineering Department (LGED)

Policy	Executing Authority
Justification: Development of roads will involve huge cost. Participatory development will enable cost sharing, which will reduce cost of road construction substantially.	

Utility Services

Utility services are the most essential parts of urban life. To make an urban center livable, there must be adequate provision for utility services. Utility services include water supply, solid waste management, power supply, sanitation and drainage. Except power supply, the rest are the responsibilities of the Paurashava.

Strategy:

- Attainment of self-reliance in revenue collection and adoption of participatory approach to service provision to ensure better services and facilities to the people.

Table 7. 10: Policy for Utility Services

Policy	Executing Agency
<u>Policy-Utility/1:</u> Exploration of alternative sources of water to ensure sustainable supply. Justification: Amid constant rise of urban population, it is time to explore alternative sources of water like, rain water harvesting and surface water supply.	- LGED - DPHE - Kaliganj Paurashava
<u>Policy-Utility/2:</u> Involvement of beneficiaries in solid waste management. Justification: Involvement of beneficiaries in solid waste management will make the operation more effective and reduce financial responsibility of the Paurashava.	- Kaliganj Paurashava, - NGOs and CBOs
<u>Policy-Utility/3:</u> Exploring re-use and recycling of waste materials to extract resources. Justification: Re-use and recycling of waste materials will produce resources and reduce cost of waste management.	- Kaliganj Paurashava, - NGOs and CBOs
<u>Policy-Utility/4:</u> Publicity on the benefits of hygienic sanitation to motivate people and enable people to have easy access to sanitary materials. Justification: Motivation will encourage people to adopt healthy sanitation and reduce health risks.	- LGED - DPHE - Kaliganj Paurashava - NGOs and CBOs
<u>Policy-Utility/4:</u> Protection of natural drainage system and preparation of hierarchical drainage network. Justification: Natural drainage systems are being grabbed and filled up, which increases the risk of water logging. Well planned hierarchical drainage network helps smooth drainage of storm and waste water.	- LGED - Kaliganj Paurashava

7.4.3 Environmental Issues

From environmental point of view Kaliganj Paurashava is not yet badly affected. There are some issues that must be taken care of. The issue of sanitation has already been dealt within the utility services section. Except seasonal flood, there is no natural hazard. There is no mentionable air, water or soil pollution in the Paurashava from any sources at present.

Natural Resources

The Paurashava is not endowed with many natural resources that can be conserved. Among the meager natural resources that are available, ponds and natural drainage canals can be mentioned.

Strategy:

- All khas lands and canals should be vested with Paurashava for use in community interest.

Table 7.11: Policy for Natural Resources

Policy	Executing Agency
Policy-Nature /1: All khas lands within the Paurashava must be assessed and handed over to the Paurashava for use in community interest. Justification: This will prevent misuse of khas lands by political and powerful local people.	- Ministry of Land - Ministry of Railway - Kaliganj Paurashava
Policy-Nature/2: All natural canals within the Paurashava must be vested with the Paurashava for maintenance and proper use as drainage canal. Justification: This will help prevent unauthorized occupation and filling of natural drainage.	- Ministry of Land - Kaliganj Paurashava - NGOs and CBOs - Ministry of Water Resource
Policy-Nature /3: Necessary planning and management measures to be adopted for preservation and enhancement of surface water quality Justification: Proper planning and management measures aimed at preserving and improving the quality of surface water resources. Restrictions should be imposed on discharge of untreated domestic and industrial sewage (liquid waste) into surface water sources. Also use of chemical fertilizers and insecticides in agricultural fields should be restricted so that storm water runoff from these fields cannot result in pollution of nearby surface water bodies.	- Ministry of Water Resource - Ministry of Land - Kaliganj Paurashava - NGOs and CBOs
Policy-Nature /4: Productive use of ponds to be promoted in order to enhance their role in economic development Justification: Emphasis should be placed on the use of existing ponds for fisheries and duck raising and integrate them with cattle rearing and poultry farming. Such integration will lower the costs of pisciculture since wastes generated from poultry and cattle rearing can be used to produce fish food and applied in the ponds.	- Ministry of Fisheries and Livestock - Ministry of Water Resource -Ministry of Agriculture
Policy-Nature /5: Identification and conservation of ecologically sensitive areas with unique ecosystem and rich biodiversity to be emphasized Justification: Areas with unique ecosystem and rich biodiversity will be identified as ecologically sensitive areas. Relevant authorities will take necessary measures for conservation of such areas.	- Ministry of Water Resource - Ministry of Environment and Forest

CHAPTER 8

IMPLEMENTATION ISSUES

This chapter deals with the issues of implementation of the Master Plan. Here, recommendations have been made about capacity building and resource mobilization for the implementation of the plan.

8.1 Institutional Capacity Building of the Paurashava

In the present context of spatial and legal jurisdiction of the Paurashava for planned development of its area, some recommendations are made here. Also, observing the financial and Institutional strength of individual stakeholders in relation to their liabilities and identifying their shortages and absence of any perfect coordinating body, some suggestions have been made as remedial measures as a whole.

- All urban local governments including Upazila level Paurashavas must be given more independence and autonomy to perform their responsibilities. At the same time, their accountability to the government and people regarding their performance has to be ensured. For this purpose the legal framework of the urban local governments has to be reviewed and updated. The legal provisions have to be consolidated and simplified and make them compatible to changing circumstances. Opportunities must be created in the Act allowing scope for privatization of service providing activities.
- To avoid duplication of development functions, there should be clear line of separation between central government and the urban local government.
- A double entry cash accounting system has to be introduced to modernize the accounting system. For this purpose, massive training programme has to be arranged for the relevant municipal staff.
- To improve revenue collection, the urban local governments should be given more power and responsibilities. Measures should be taken for strengthening the Paurashava administration for municipal development.
- Section-50 of the Paurashava Act needs to be revised and more power should be given to the Executive Officer for appointment of employees.

It cannot virtually function effectively as a Paurashava under such a stringent financial condition. To function, effectively, it must raise its revenue earning. But it is reported that the Paurashava cannot collect all its holding tax from the citizens. Holding tax is the most important source of its own revenue earning. It must take care to ensure 100% recovery of holding tax. The Paurashava cannot function effectively depending upon government grant only. The existing manpower position of the Engineering, Development control and Accounts should be substantially raised to handle future volume of work. Moreover, additional staff especially for the implementation of Master Plan will soon be required.

The present plan package imposes a large number of development projects on Kaliganj Paurashava for implementation. Paurashava will not only be the custodian of the plan, it

will also directly implement much of the development projects. Besides, it will also be responsible for monitoring and implementation of the development projects by other urban development and service giving agencies. This situation calls for strengthening of the existing capability of Paurashava.

8.1.1 Staffing and Training

As a traditional system of the Paurashava, engineer and secretary are appointed directly by the Ministry of Local Government and other staffs are appointed locally through the approval of the Ministry after the advertisement on the newspapers. In Kaliganj Paurashava, the revenue income is too low. That is why it is not capable to pay the salary of all the officials and staffs. This is the main reason for under staffing of the Paurashava.

There is no proper arrangement for staff training. As a result, the staffs are mostly unskilled. They cannot deliver proper service to the citizens. Besides, most of them are not qualified enough to render proper services.

8.1.2 Lack of Automation

Most works in the Paurashava are done manually. Such practice delays works and deprives the citizens from services. This is also a source of mal-practice and corruption. Modern office and working equipment should be installed. Use of modern technology will increase efficiency in planning and record keeping, finally expedite decision making process.

8.1.3 Lack of Paurashava Town Planning Capacity

At present, the Paurashava has no town planning section or any appropriate manpower to prepare and implement the Master Plan. The Paurashava must strengthen its capacity to implement its Master Plan when it will be completed. It will otherwise be in trouble in the implementation, monitoring and updating the Master Plan.

8.1.3.1 Institutional Framework

To rearrange the institutional framework for the Paurashavas recently the government has made a committee for the categorization of all the Paurashavas of Bangladesh. According to the clause no. 72-78 (Paurashava Officer & staff, provident fund etc) of Local Government (Paurashava) Act, 2009 and on the basis of the type and category of works, the committee suggested 5 divisions within the Paurashava framework. Afterward on the basis of the type of works, similarities and technicalities each division is further subdivided into some sections accordingly. The suggested divisions and sections are as follows:

- Planning Division:**
- a) IT Section
 - b) Planning Section
 - c) Beautification and recreation Section

According to the divisions and their relevant sections the manpower should be set up for each category of Paurashava. The above committee has also chalked out the detail scope of work for each division. The scope of proposed Planning Division is given in Figure 8.1.

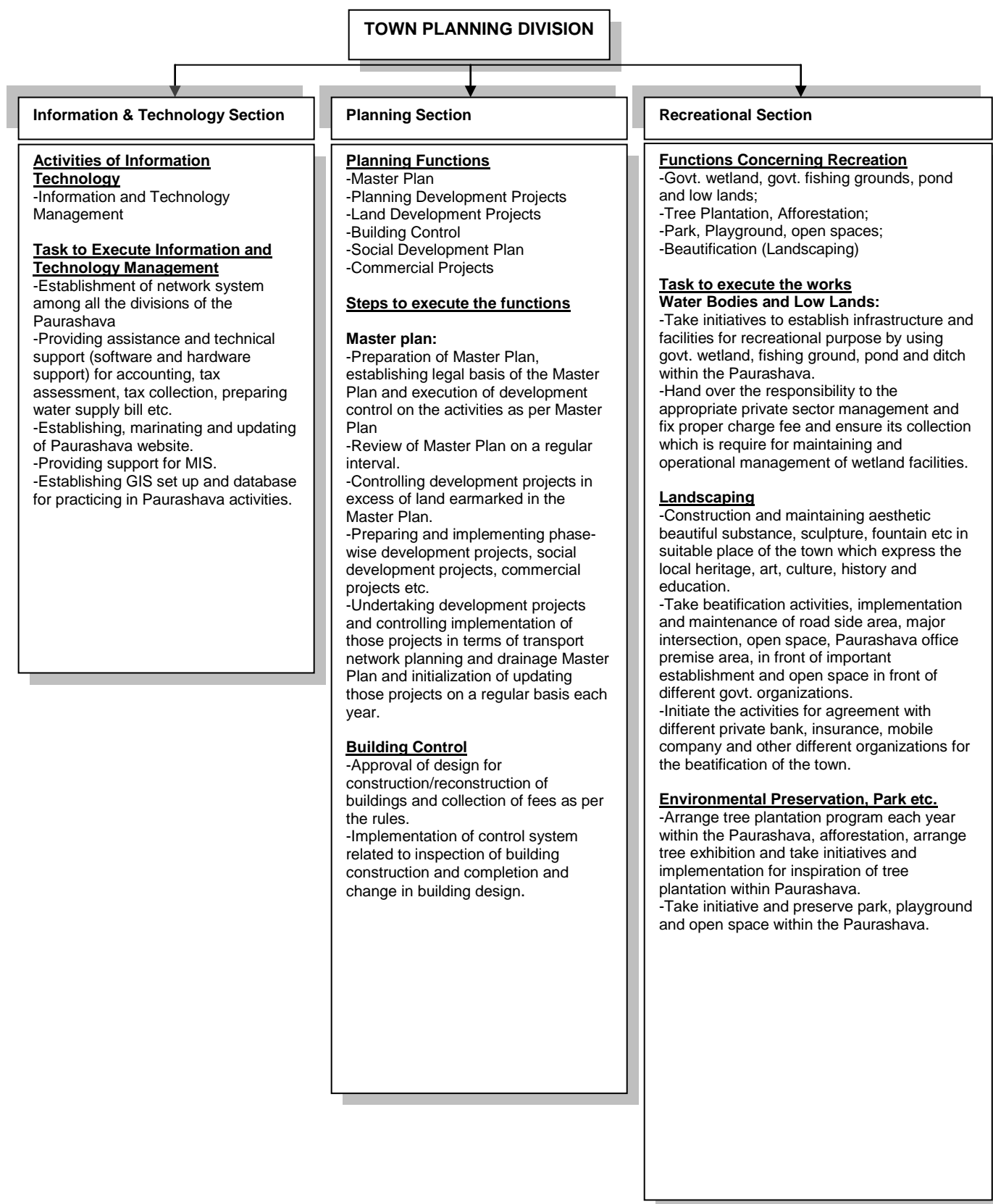


Figure 8. 1: Scope of Work for Planning Division

8.1.3.2 Lack of Paurashava Town Planning Capacity

At present, the Paurashava has no town planning division or any appropriate manpower to prepare and implement the Master Plan. For proper implementation of the Master Plan in each Paurashava establishment of a separate planning division is indispensable. The Paurashava must strengthen its capacity to implement its Master Plan when it will be completed. It will otherwise be in trouble for implementation, monitoring and updating the Master Plan.

Kaliganj is an 'A' class Paurashava. For the 'A' class Paurashava Government approved an organogram and required manpower. A comparison of the existing manpower with the approved organogram finds that there is a huge gap between the two. Many positions have been vacant since the inception of Paurashava. Paurashava authority supported with the line ministry should take necessary steps to set up planning unit and strengthen all units/division of the Paurashava for its better performance.

Support for Planned Urbanization

For creating planned urbanization, Paurashava may:

- Support for preparation of Computerized Infrastructure Database.
- Support for Preparation of Paurashava Base Map.
- Support for Preparation of Paurashava Infrastructure Development Plan.
- Orientation on preparation, use, update & implementation of Paurashava Master Plan.
- Assist preparation and execution of Community Development Plan by Community Based Organization (CBO).
- Introduce 3D-Modeling in Master Planning components.
- Beautification of Paurashava by 3D-Modeling.

Community Mobilization Program

Following are the community mobilization support activities:

- Support to establish Town Level Coordination Committee (TLCC) and make it functional
- Support to establish Ward Committee (WC) and make it functional.
- Support for preparation of Community Planning and implementation by forming Community Based Organization (CBO).
- Support to accelerate the Paurashava Standing Committee activities.

Urban Governance Improvement Action Programme (UGIAP)

- It is stipulated in the 6th 5 year plan 'the Key constraints to the effective functioning of the Paurashavas and City Corporations are unclear mandate and service responsibilities; lack of accountability; weak finances and financial autonomy; poor coordination and control among service agencies and weak management'.
- To overcome the challenges, the 6th Five year plan as well as Perspective Plan of Bangladesh, 2011-31 recommends the same issues mentioned below:

- the instructional reform and decentralization of responsibilities and resources to local authorities; participation of civil society including woman in the design, implementation and monitoring of local priorities; building capacity of all actors (*Institutions, groups and individuals*) to contribute fully to decision making an urban development process; and facilitate networking at all levels.

It is already tested, proven and accordingly recognized in the 6th Five year plan that urban infrastructure improvements have been proved very successful introducing governance and performance-based approach adapted by UGIIP in selected ULBs in the country. Among other suggestions the 6th Five year plan also includes nature for Urban Governance Improvement Action Programme (UGIAP) and Capacity Building of Institutes at Municipality-level in particular.

Citizen Awareness and Participation

The Paurashava authority may initiate to buildup citizen awareness and to ensure peoples participation in plan initiation and implementation process. Initiatives may be as follows:

- Establishment of Civil Society Coordination Committee (CSCC) and make it functional
- Establishment of Ward Level Coordination Committee (WLCC) and make it functional
- Citizen Charter display at Paura Bhaban.
- Citizen Report Card Survey by the Paurashava.
- Establishment of Grievance Redress Cell and make it functional with specific ToR
- Establishment of Mass Communication Cell (MCC) and make it functional
- Establishment of Urban Development Coordination Unit with inclusion of other departments for inclusive development

Urban Planning and Environmental Improvement

- Master plan is a guideline and detail urban planning activities are being prescribed in the plan. To produce a livable environment in the Paurashava premises, following initiatives should be taken:
- Recruitment of staffs and establish Planning Department related to administrative structure, meeting and meeting minutes preparation.
- Master Plan, Base Map verification and update landuse plan preparation.
- Approval of building plan and development control.
- Introduction of environment and public health activities.

Urban Poverty Reduction

Following initiatives can be taken by the Paurashava for urban poverty reduction:

- Establishment of Slum Improvement Committee (SIC) in selected slums and scattered area.
- Preparation of poverty reduction action plan with guideline and necessary budget allocation.

Income Generating Activities

The income generating activities include:

- Tax assessment software use and capacity development for staffs of assessment section.
- Continue reassessment activities regularly at 5 years interval.
- Continue interim assessment regularly in whole year.
- Introduction of computerized tax system and bill preparation.
- Increase collection by more than 5% annually (*up to 85% collection efficiency*).
- Increase non-tax own revenue source at least by inflation rate.
- Introduction of computerized trade license system and computer bill/ license prepared and report produced.
- Introduction of computerized Water bill (*Tariff*) system.
- Introduction of Computerized non-motorized vehicle management system.
- Identification of new income sources for increasing income.

Transparency and Accountability

Functions and activities performed by the Paurashava authority should be transparent and the persons responsible for performing activities for betterment of the society should maintain accountability to the Paurashava people as well as central government. Following guidelines may be followed for such performances:

- Administrative Reformation of Paurashava.
- Set Vision, Mission and functions for each department/ section of the Paurashava.
- Functions to be decentralized, transfer and coordination with other authorities.
- Establishment of Capacity Development Committee in Paurashava-level.
- Establishment of Urban Information Services Centre at Paurashava premises.
- Meet the Mass people of Paura-Parishad.

8.1.4 Legal Aspects

The drive to establish strong urban local governance in the Paurashava is yet to be legalized. The governance programmes at present are operated project wise based on the formulated policies of the implementing agencies of the national government. The Laws that the country inherited are mostly prepared during the colonial rule to serve its own interests. Even after independence from the British, the issue of good governance was not infused into the new Acts formulated.

8.1.5 Good Governance in Legal Provisions

There is hardly any Act where the elements of good governance are clearly visible. The consultant has identified some Acts, where some elements of good governance can be traced.

The Paurashava/Municipal Act/Ordinances prepared at different times since 1960's have iterated for the preparation of Master Plan by the Paurashava/Municipality for its planned

development. So far urban local government Ordinances/Acts made in 1967, 1977, 2008 and 2009, all suggested for planned development. The Local Government (Paurashava) Act, 2009 has made the provision of having a Master Plan prepared by a Paurashava within five years of its inception. The function of the Paurashava also includes that it ensures planned development following the rules of the Ordinance. But there is no provision for public participation in the Local Government (Paurashava) Act, 2009. In all these legal documents, people's role has been ignored which is the violation of the norms of good governance.

The constitution of the Peoples' republic of Bangladesh clearly spells out that the Government should work to minimize the gap between urban and rural areas. A planned Paurashava development in that pursuit can provide necessary services to improve quality of life in both urban and rural areas within the Upazila.

8.1.6 Financial Issues

Governance in Kaliganj Paurashava

Financial governance refers to transparency and accountability of financial matters. All financial matters must be transparent to all. People must know about the policies and programs of the Paurashava, how much revenue is collected each year and the amount of expenditure made on annual development. They must also be answerable to the people on how the public money is being spent and accounts being maintained.

The Ministry of LGRD and Cooperative has undertaken a number of projects in respect of establishing governance in upgrading Paurashava accounts system, like, UGIIP, STIFPP. Computer and accessories are supplied under these projects for automation of the accounts system. Besides, trainings are also offered to the Paurashava accounts staff for enabling introduction of automation in accounts system. But all these services have not yet reached Kaliganj Paurashava.

Revenue Management

The Paurashava still follows a traditional management system in tax collection and revenue management though a scheme of computerized automotive financial system has already been introduced in this Paurashava. Assessment section is responsible to assess the tax of the Paurashava and tax collection, and license and bazar section are responsible to collect the tax of the Paurashava. The public is mainly informed about tax collection during the presentation of annual budget. They may, however, get information from the councilor or Paurashava accounts office.

Paurashava's Financial Capacity and Plan Execution

The main focus of Paurashava financial governance is to establish automation in entire financial management. This includes computerization of accounts system, holding tax management, and billing of different service charges. Software for above functions have been supplied and installed in the Paurashavas covered by financial automotive projects. The projects also provided training to the relevant staffs for functioning of the systems. With the implementation of these projects people can now instantly know about the status of their tax payment, bill payment, and licensing. This has not only made the functions of

the Paurashava easy, but also has freed the citizens for paying bribe, and experiencing hassle.

The size of annual budgets of the Paurashavas indicates the poor financial status of the Paurashavas. With low income, Kaliganj Paurashava will have to depend substantially on the government funding for implementing the development projects. But the government has limitations of its resources. In such a situation, if the Paurashava can not raise its own revenue adequately, it will not be able to execute much of the development projects under the Master Plan.

8.1.7 Monitoring, Evaluation and Updating

Monitoring and evaluation is a very important part of plan implementation. Monitoring helps check if the plan is being implemented properly. It also measures the level of implementation of the plan. If the plan implementation is not on track, corrective measures can be taken to put execution on the track. After expiry of any plan, evaluation is made about the errors and omissions. Such evaluation helps take corrective measures in the next plan. Such monitoring and evaluation must be carried out from within the Paurashava. But Kaliganj Paurashava is not equipped with qualified manpower to make such evaluation. Monitoring and evaluation of a plan is essentially, the responsibility of qualified and experienced planners. As there is no planner in the Paurashava, monitoring of plan implementation will be seriously affected. However, plan evaluation can be accomplished by means of out sourcing as and when it is required.

8.1.8 Periodic Review and Updating

The plan package needs to be updated regularly to make it respond to the spatial changes over time. But such updating would require relevant technical professionals and requisite fund that are highly lacking in Kaliganj Paurashava. As there is no planner or planning section in the Paurashava, review and updating of the Master Plan will require service of senior level planners that Paurashava might not be able to provide. This service will have to be procured by out sourcing and the Paurashava is not even capable to accomplish this financially either. This will create problem when the plans or its components gets obsolete or need to be changed. Another problem would arise when the duration of plans ends. It is necessary that the entire plan document (including all planning and land use proposals) should be reviewed every 4th year of the plan period and will come into execution from the 5th year. The aim of the review will be to analyze the status of implementation of plan provisions, the changing physical growth pattern, infrastructure development, and the trend of public and private physical development including growth direction.

A new set of plans will have to be prepared replacing the old ones. This problem, however, can be overcome by undertaking another planning project by LGED. So, for regular updating and changes, and plan implementation monitoring, the Paurashava should immediately set up a planning section with a number of planners and other staff. The section will not only look after planning, but will also be responsible for development control, estate management, and project preparation. Since the planners would be qualified and skilled in computer operation, they can also help achieving automation of the Paurashava functions.

8.2 Resource Mobilization

Resource mobilization will be one of the most challenging tasks in implementing the current plan package. Though the development proposals are said to be executed by a large number of development agencies, but it is beyond doubt that the heaviest burdens will have to be shouldered by the Paurashava. As a local government agency, it suffers from resource constraint due to low level of urbanization and investment by both public and private sectors. The land value will maintain perpetually low growth rate in the town. Therefore, prospect of mobilization of substantial resource from sale of serviced land is extremely meager. For the same reason, revenue earning from betterment fee, planning permission and other sources may also remain low. Paurashava is heavily dependent on the government for executing its development projects as it is unable to collect sufficient revenue from its tax and non-tax sources. Therefore, it is clear that execution of development projects under the current plan will depend heavily on the government response to supply adequate fund. This situation calls for increasing revenue earning by generating new revenue sources.

8.3 Concluding Remarks

From the past experience, it has been observed that plans are prepared for organized development, but development control has been subject to negligence. In most cases, execution has been piece-meal. It is unfortunate that town planning has not yet become a part of our urban development culture. Individuals develop lands and construct buildings with a little respect for planned development, and the concerned authority is also unable to exercise full control on development. Some strict measures are necessary to make stakeholders follow up plans and development rules. Awareness is to be built among the people to follow the Master Plan provisions and plan. Government agencies must be compelled to follow plans. Existing laws in this regard must be updated incorporating provisions of plan execution.

CHAPTER 9

URBAN AREA PLAN

This is the first chapter of Part- B that starts with Urban Area Plan. Urban Area Plan is the mid-level plan that covers the existing Paurashava. It lays down the land use zoning plan and infrastructure development proposals at the town level. Land use planning is an important part of Master Plan ensuring that land is used efficiently for the benefit of economy, society and environment of Kaliganj Paurashava. This planning means the scientific, aesthetic, and orderly disposition of land, resources, facilities and services with a view to securing the physical, economic and social well-being of urban communities.

9.1 Goals and Objectives of Urban Area Plan

Urban Area Plan is the first phase illustration of the Structure Plan intended to be implemented over a time span of 10 years that includes 1st phase (1st -5th year) and 2nd phase (6th -10th year) of development programs. The Urban Area Plan has been prepared within the policy framework of the Structure Plan and aims to attain the overall project objectives. So there is a hierarchical relationship between the two. In fact, Urban Area Plan is the first phase detailed illustration of the policies and strategies of the structure plan.

The preparation of Master Plan for Kaliganj Paurashava is aimed towards its future development, and covers the areas that are likely to become urban in future. The Urban Area Plan is aimed to:

- Determine the present and future functional structure of the town, including its land uses; and
- Provide infrastructure proposals for improving and guiding development of future urban area.

9.2 Methodology and Approach to Planning

The base map supporting for land use survey was obtained from the physical feature survey that contained all categories of physical features within the planning area (Chapter 3 of Survey Report). During physical feature survey, all structures and the functions of principal buildings were picked up and depicted on the map. The physical features were superimposed on a mouza map and printed for land use survey on the map. The map was carried to the field by investigators for detailed plot to plot land use survey (Chapter 4 of Survey Report). The field investigators carrying the map visited each and every plot and the structures therein and noted their uses in writing and marking them on the map with colour pencil. They also verified the land uses and put during the physical feature survey. Back in the office, the common land uses of plots were delineated in the map as per land use format given in the ToR. The delineated zones were then digitized and a new land use map was prepared for the entire planning area. After land use demarcation, field checking was done to correct possible errors.

Urban Land Use Plan is aimed to guide the physical development of Kaliganj town including its economic and social activities. This plan adheres to the policy directives spelled out in the Structure Plan. The current Urban Area Plan is akin to the traditional Master Plan approach prevalent in the country that designates plot-to-plot use of land apart from infrastructure development proposals. Thus it will also serve as a development control mechanism/instrument. The Urban Area Plan is, therefore, more rigid than Structure Plan. Making a land use plan on a cadastral map makes the Urban Area Plan more rigid. Once the plan on a cadastral map is drawn and accepted by the government and formalized, it gains a formal status and thus becomes a binding for all concerned.

The objectives of the Urban Area Plan have been attained through:

- Orderly location of various urban land uses;
- Location of appropriate transportation and drainage network; and
- Orderly location of services and facilities.

9.2.1 Delineation of Planning Areas

For delineation of Master Plan area, it is necessary to identify the possible future urban growth locations. The objective of project area demarcation is to determine the boundary of the area and mark it on the map as well as in the field. Logic behind the delineation of the Planning area of Kaliganj Paurashava for the year 2031 has been done on the basis of the gazette notification of the Paurashava and after the reconnaissance survey within the area, the discussions with all groups of stakeholders, analyzing the present trend of developmental growth of the town. Cooperation of the Paurashava was more important in delineating the Paurashava area in the cadastral map and the future planning area boundary (Detail was given in Chapter 2, Section 2.4 of Survey Report). As conversant with local conditions and the future trend of development, valuable advices were received from the Paura Mayor and its engineers and other staffs. Table 9.1 presents the detail about the mouzas, within the 9 wards of the Paurashava along with their areas in acre.

Table 9.1: Ward wise RS Mouza sheet

Ward	Mouza Name	J.L. No.	Sheet No
Ward No. 01	Bakulia	16	0
	Kaliganj	17	1
			2
	Nischintapur	36	1
	Sreerampur	18	0
Ward No. 02	Bakulia	16	0
	Foila	29	0
	Kaliganj	17	1
			2
	Khayertal	15	0
	Paikpara	14	0
Ward No. 03	Foila	29	0
	Helai	34	0
	Kaliganj	17	2
	Nischintapur	36	1
Ward No. 04	Foila	29	0
	Helai	34	0
Ward No. 05	Arapara	28	0
	Kaliganj	17	2
	Nischintapur	36	1
			2

Ward	Mouza Name	J.L. No.	Sheet No
Ward No. 06			2
			3
Ward No. 07	Arapara	28	0
	Kaliganj	17	2
	Nischintapur	36	1
	Shibnagar	27	2
Ward No. 08	Babra	70	0
			1
	Nischintapur	36	2
			3
Ward No. 09	Shibnagar	27	0
	Kaliganj	17	2
	Nischintapur	36	3
	Shibnagar	27	0
	Sreerampur	18	0

Source: Field Survey, 2009.

9.2.2 Content and Form of Urban Area Plan

The Urban Area Plan is presented in both map and textual format. The plan map is presented in 1:1980 or 1 inch to 165 feet scale, superimposed on latest cadastral/revenue map having plot boundaries within mouzas. The plan is accompanied by an explanatory report supported by necessary figures, maps and data. The report explains the various plan proposals and other components of the plan. At present, the Urban Area Plan covers existing Paurashava area within the Structure Plan area of 15.96 sq. km. or 3943.93 acres with a present population of 45341 of Kaliganj Paurashava exclude the outside area. Urban area plan covers 99% of total structure plan area of Kaliganj Paurashava.

The Urban Area Plan of the Master Plan of Kaliganj Paurashava contains several components. These are:

- i) Land Use Plan;
- ii) Transportation and Traffic Management Plan;
- iii) Drainage and Environmental Management Plan and
- iv) Proposals for Urban Services.

CHAPTER 10

LAND USE PLAN

The Land Use Plan is the main part of the Urban Area Plan and is planned for the period of first 10 years. The proposals in the Land Use Plan will be implemented through the 1st and 2nd phase development programs of the Master Plan. The 1st phase development projects are identified as priority projects and are listed in the Ward Action Plan for implementation within the first five years of the Master Plan.

10.1 Existing and Projected land use

This section describes the analysis of existing and proposed land uses and at the same time mentions estimation on the requirement of land for different land uses. It also lays down the land use zoning plan and infrastructure development proposals at the town level.

10.1.1 Existing Land Use

Map 10.1 illustrates how the land uses are distributed at present in the Paurashava area. The information helps the preparation of Master Plan providing background information for selection of areas of different land uses.

The land uses of the project area are shown in Table 10.1. In the land use pattern of the Paurashava, 17 types of land uses are found. It is clearly evident from the table that agricultural land use (almost 70%) dominates the Paurashava area, followed by residential (17.59%), water bodies (3.86%), circulation network and transport and communication (only 0.04%), vacant place (about 1.60%) and government services 0.31%, educational land use occupy only 0.33% percentage of land.

Table 10. 1: Existing Land use Classification of Kaliganj Paurashava

Sl. No.	Landuse	Area in Acre	Area (%)
01	Agricultural	3852.25	70.77
02	Circulation Network	119.38	2.19
03	Commercial	43.08	0.79
04	Community Services	8.35	0.15
05	Education & Research	17.76	0.33
06	Government Services	17.03	0.31
07	Industrial/ Manufacturing Processing	97.35	1.79
08	Mixed Use	11.85	0.22
09	Non-Government Services	0.51	0.01
10	Recreational Facilities	0.37	0.01
11	Residential	957.75	17.59
12	Restricted Area	0.16	0.00
13	Service Activity	6.72	0.12
14	Transport and Communication	2.19	0.04
15	Urban Green Space	11.02	0.20
16	Vacant Land	86.97	1.60
17	Water body	210.32	3.86
Total		5443.71	100.00

Source: Land use Survey, 2009.

Map 10.1: Existing Land Use Map of Kaliganj Paurashava

10.1.2 Land Requirement Estimation

This section proposes land use zoning plan for different land uses of the future town. The estimations have been made according to the Planning Standard approved by the client. The category wise land allocations are provided below.

Table 10.2: Existing and Proposed Landuses Including Standard

Facilities	Standard (LGED)	Existing Land of 2011 (acres)	Land Requirement for 2021 (acres)	Land Requirement for 2031 (acres)	Additional Requirement for 2031
Population		45341	58609	75760	
Residential					
General Residential	1.00 acre/ 100 pop.	650.04	586.09	757.6	-
Administration		17.03	20	20	2.97
Upazila Complex	15 acres/ Upazila HQ	6	15	15	9
Paurashava Office	3 acres/ Upazila HQ	1	5	5	4
Commerce		43.08	64.47	83.34	40.26
Wholesale Market	1.00 acre/ 10000 pop.	0	5.86	7.58	7.58
Retail sale Market	1.00 acre/1000 pop.	0	58.61	75.76	75.76
Neighborhood Market	1.00 acre/ Neighborhood market	0	4	4	4
Super Market	1.50 acres/ super market	0	1.5	1.5	1.5
Industry	1.50 acres/ 1000 pop.	97.35	146.52	189.4	103.14
Education		17.76	89.98	114.85	97.09
Primary School	2.00 acres/ 5000 pop.	0	23.44	30.3	30.3
Secondary School	5.00 acres/ 20000 pop.	0	14.65	18.94	18.94
College	10.00 acres/ 20000 pop.	0	14.65	18.94	18.94
Vocational Institute	5.00 acres/Upazila	0	5	5	5
Others (Madrasa)	5.00 acres/ 20000 pop.	0	14.65	18.94	18.94
Health Facilities		4.72	21.72	25.15	20.43
Upazila Health Complex/ Hospital	10 acres/ Upazila HQ	0	10	10	10
Health Center/ Maternity Clinic	1.00 acre/ 5000 pop.	0	11.72	15.15	15.15
Open Space/ Recreation		11.02	131.01	167.88	156.86
Playground	3.00 acres/ 20000 pop.	0	8.79	11.36	11.36
Park/ Open space	1.00 acre/ 1000 pop.	0	58.61	75.76	75.76
Neighborhood Park	1.00 acre/ 1000 pop.	0	58.61	75.76	75.76
Stadium	7 acres/upazila HQ	0	7	7	7
Cinema	0.5 acre/ 20000 pop.	0	1.47	1.47	1.47

Community Facilities		8.36	17.65	22.44	21.94
<i>Mosque/ Temple/ Church</i>	0.50 acre/ 20000 pop.	0	1.47	1.89	1.89
<i>Eidgah</i>	0.50 acre/ 20000 pop.	0	1.47	1.89	1.89
<i>Graveyard</i>	1.00 acre/ 20000 pop.	0	2.93	3.79	3.79
<i>Community Center</i>	1.00 acre/ 20000 pop.	0	2.93	3.79	3.79
<i>Police Station</i>	3 acres/ Upazila HQ	0	3	3	3
<i>Fire Service Station</i>	1.00 acre/ 20000 pop.	0	2.93	3.79	3.79
<i>Post Office</i>	0.50 acre/ 20000 pop.	0	2.93	3.79	3.79
Utility Services		0	11.01	14.01	14.01
<i>Telephone/ Telegraph Exchange</i>	0.50 acre/ 20000 pop.	0	1.47	1.89	1.89
<i>Electric sub-station</i>	1.00 acre/ 20000 pop.	0	2.93	3.79	3.79
<i>Garbage Disposal</i>	1.00 acre/ 20000 pop.	0	2.93	3.79	3.79
<i>Waste Transfer Station</i>	0.25 acre/waste transfer Station	0	0.75	0.75	0.75
<i>Water Supply</i>	1.00 acre/ 20000 pop.		2.93	3.79	3.79
Transportation Services		2.19	7.33	9.47	7.28
<i>Bus Terminal</i>	1.00 acre/ 20000 pop.	0	2.93	3.79	3.79
<i>Truck Terminal</i>	0.50 acre/ 20000 pop.	0	1.47	1.89	1.89
<i>Tempu Stand</i>	0.25 acre/ 20000 pop.	0	0.73	0.95	0.95
<i>Rickshaw Stand</i>	0.25 acre/ 20000 pop.	0	0.73	0.95	0.95
Roads	15% of the built-up land	119.38	141.58	141.58	115.26
Urban Deferred	10% of the total built-up area	0	94.39	94.39	94.39

Housing

Housing is the most significant segment of urban development scenario. The future housing area need to be based on a recommended planning standard of 100-150 ppa. With this standard, the estimation shows, the maximum land required to accommodate total projected population (75760) in the year 2031 will be 757.60 acre. But survey of existing land use has identified 650.04 acre of land is currently under housing use. The consultant considered the standard for general housing as 100 ppa. Considering this standard, the land requirement for residential use will be 107.56 acre. Table 10.2 shows the detail.

Table 10.3: Estimation of Housing Land Requirement

Use/Facility	Recommended Standard	Land in Acre		
		Estimation	Existing Land	Add. Requirement
General Residential	100 person/acre	757.60	650.04	107.56
Total		757.60	650.04	107.56

Commerce and Shopping

Market facilities are usually provided privately on commercial basis depending on the trend of sale of goods. So it is not possible to fix a standard or project actual area for these services. The standard for commercial use can only be applied if ever these facilities are provided by the Paurashava. However, for the sake of current planning, land as per standard at appropriate location is earmarked, where commercial facilities may be developed privately or publicly. 75.76 acres area for retail sale market is not feasible according to the planning team (vide Table 10.2). So the total commercial land in 2031 has been fixed at 35.46 acres. The following table shows the detail.

Table 10.4: Estimation of Land Requirement for Commerce and Shopping center

Use/Facility	Land in Acre			
	Projected Landuse	Existing Land	Add. Requirement	Future Landuse Consideration by the Planning Team
Commerce and Shopping	83.34	43.08	40.26	35.46
Total	83.34	43.08	40.26	35.46

Industry

According to approved planning standard, the total land for industries is estimated to be 189.40 acres where 86.26 acre is existing small scale industry . It requires 115.99 acres of manufacture and processing land by year 2031. The following table shows the details.

Table 10.5: Estimation of Land Requirement for Industries

Use/Facility	Land in Acre			
	Projected Landuse	Existing Land	Add. Requirement	Future Landuse Consideration by the Planning Team
Industrial	189.40	86.26	103.14	115.99
Total	189.40	86.26	103.14	115.99

Education

Estimation of land according to standard indicates that there will be a land requirement of 114.85 acres to accommodate educational facilities by the year 2031. If we deduct the already available 17.76 acres of existing land uses under various education facilities, there will be need of additional 97.09 acres of land for education facilities will be required as shown in the following table. But at present circumstances estimated area with 30.3 acres for primary schools, 18.94 acres for secondary schools and 18.94 acres for college are not feasible according to the planning team. So, the planning team has decided to consider 24.99 acres area for education facilities.

Table 10.6: Estimation of Land Requirement for Education Facilities

Use/Facility	Land in Acre			
	Projected Landuse	Existing Land	Add. Requirement	Future Landuse Consideration by the Planning Team
Education & Research	114.85	17.76	97.09	24.99
Total	114.85	17.76	97.09	24.99

Health

In future, as the population and density increases, demand for local health facilities other than Health centre will increase which currently use only 4.72 acre. So the Paurashava requires additional 18.81 acres of land for the Health centre/Maternity clinics in future. 20.43 acres for health facilities is not feasible according to the planning team because there are some health services in mixed used categories. So, the planning team has decided to consider 5.55 acres area for education facilities. The following table shows the detail.

Table 10.7: Estimation of Land Requirement for Health Facilities

Use/Facility	Land in Acre			
	Projected Landuse	Existing Land	Add. Requirement	Future Landuse Consideration by the Planning Team
Health Facilities	25.15	4.72	20.43	5.55
Total	25.15	4.72	20.43	5.55

Community Facilities

For various community facilities, the total land requirement has been fixed at 22.44 acres. There are already exists only 8.36. Total 14.08 acre of land is also required for community and other services up to 2031. The following table shows the detail.

Table 10.8: Estimation of Land Requirement for Community Facilities

Use/Facility	Land in Acre			
	Projected Landuse	Existing Land	Add. Requirement	Future Landuse Consideration by the Planning Team
Community Facilities	22.44	8.36	14.08	18.18
Total	22.44	8.36	14.08	18.18

Open Space/ Recreational Facilities

Field survey shows no public park or play field in the town, except play grounds in the premises of educational institutions. The total land required for various open space recreation facilities recommended by client stands at 171.67 acres. 160.65 acres for open space is not feasible according to the planning team because there is huge open space in agriculture and river area. So, the planning team has decided to consider 5.55 acres area for education facilities. The facilities include, play field/ground, parks of various categories and stadium/sport complex.

Table 10.9: Estimation of Land Requirement for Open Space/ Recreational Facilities

Use/Facility	Land in Acre			
	Projected Landuse	Existing Land	Add. Requirement	Future Landuse Consideration by the Planning Team
Recreational Facilities	3.79	0.00	3.79	0.29
Open Space	167.88	11.02	156.86	52.02
Total	171.67	11.02	160.65	52.31

Utilities

A number of utility establishments are required in a town to run services properly. The consultant, according to approved standard, has earmarked 13.42 acres for utilities like water supply installations as pump stations and other establishments related to water

supply, dumping site, final disposal of the solid waste etc. The following table shows the detail.

Table 10.10: Estimation of Land Requirement for Utilities

Use/Facility	Land in Acre			
	Projected Landuse	Existing Land	Add. Requirement	Future Landuse Consideration by the Planning Team
Utility Service Facilities	18.94	0.00	18.94	13.42
Total	18.94	0.00	18.94	13.42

Transport and Communication

Estimation of land according to standard indicates that there will be a land requirement of 9.47 acres to accommodate transport and communication facilities by the year 2031. If we deduct the already available 2.19 acres of existing land uses under railway facilities, an additional 7.28 acres of land is required for this category land use. But considering the future 11.06 acres area is considered by the planning team for the transport and communication sector. The following table shows the detail.

Table 10. 11: Estimation of Land Requirement for Transport and Communication

Use/Facility	Land in Acre			
	Projected Landuse	Existing Land	Add. Requirement	Future Landuse Consideration by the Planning Team
Transport Facilities	9.47	2.19	7.28	11.06
Total	9.47	2.19	7.28	11.06

10.2 Land Use Proposals

Bangladesh is the most densely populated country in the world. The land area of the country remains static amid continuously increasing population. Such a situation calls for strict regulation to utilize its scarce land resources for non-agricultural purposes. Increase in urban population means more demand for houses, roads, schools, hospitals, factories, bazars, shops, business centers, offices and other service facilities. Providing all these facilities require land and that is at the cost of valuable agricultural land, as the country has hardly any fallow land to accommodate all these land uses. Kaliganj Paurashava is surrounded by valuable fertile agricultural land. Any urban expansion will cost net deduction of agricultural land that will consequently affect local food and cash crop production. A conservative and rational standard of space use and their proper application in planning, designing and development is, therefore, followed in the land use proposals.

10.2.1 Designation of Future Land Use

Designation of the future land uses in the Land use Plan is an important task of planning as it will ensure the compliance with the Structure Plan guidelines and provide the details of land use pattern along with transport and drainage network and utility lines. The existing uses and new proposals of land uses for future development have been identified and designated on the map for compliance by law. The land use categories with quantity of land required are based on the sector needs for now and in future. The implementation of

the plan will require cooperation and collaboration of relevant authorities and agencies, and the Paurashava being the custodian of the Plan will safeguard the status of the Plan.

10.2.2 Land Use Zoning

Development control is an essential part of urban planning. For development control certain procedures have to be followed for approval of designs of various categories of structures, establishments and land uses. The first condition is to secure land use permit according to approved zoning plan followed by approval of the design of proposed building/structure.

10.2.2.1 Types of Land Use Zoning

In land use zoning, the entire area of a town is divided into suitable land use zones to create congenial and livable environment and thereby enhance land value. In Bangladesh such land use zoning is incorporated as a part of the master plan / land use plan/urban area plan. Before submitting building plans for approval an applicant must secure land use permit from the Paurashava. For land use permit, an applicant's prospective use of structure must be compatible with the approved land use zone of the site. Land use zoning limits activities that can or cannot function on a land parcel by establishing a range of development options. Land use zoning is a legal instrument by application of which a Paurashava can control,

- a) The height of building/structure,
- b) The area of a land parcel that must be left vacant, and
- c) The use of a buildings and land.

Zoning can be of three types, area zoning, density zoning and height zoning.

Area Zoning

By area zoning an area is divided into zones suitable for that particular area. The main objectives of such zoning are done mainly from environmental point of view that accrues other social benefits.

Density Zoning

The aim of the density zoning is to limit the size of population in any particular area by means of density control. The size of population has bearing on the capacity of designed utility facilities and amenities and traffic volume and crowding, especially in the residential areas. Such zoning is done to ensure a healthy and enjoyable community living.

Height Zoning

Height zoning restrict the height of buildings structures in any particular area. This zoning is aimed to promote the proper and sound development of areas. Height zoning is of particular importance in airport areas to ensue takeoff and landing of aircrafts.

Considering the existing level of development and development prospects, the consultant recommends to follow the area zoning only. Zoning is only a part of development control regulations. A prospective developer in a Paurashava has to comply with other rules and regulations, like, Building Construction Rules, 1996 under East Bengal Building

Construction Act 1952, Bangladesh National Building Code 1993 and other conditions of construction method, building safety and associated issues.

10.2.2.2 Classification of Land Use Zoning

The following land use zone classification is recommended under the current Paurashava Master Plan.

Table 10.12: Proposed Land Use Categories for Urban Area Plan of Kaliganj Paurashava

Sl. No.	Land use Category	Remarks	Area (Acres)	%
01	Urban Residential Zone	Urban Residential area is a land use in which housing predominates. These include single family housing, multi-family residential, or mobile homes. Zoning for residential use may permit some services or work opportunities or may totally exclude business and industry. It may permit high density land use.	1048.69	19.26
02	Rural Settlement	Rural settlement includes the low dense residential area which is scattered and rural in nature. It may permit only low density uses. Aiming to control the growth in this zone, less service and facilities will be provided.	530.86	9.75
03	Commercial Zone	The land used for commercial activities is considered as commercial land use. These activities include the buying and selling of goods and services in retail businesses, wholesale buying and selling, financial establishments, and wide variety of services that are broadly classified as "business". Even though these commercial activities use only a small amount of land, they are extremely important to a community's economy. Commercial land includes established markets and areas earmarked for markets.	35.46	0.65
04	Mixed Use Zone	Mixed land use refers to the area without a dominant land use (Residential, commercial, industrial etc.).	27.40	0.50
05	General Industrial Zone	Green and Orange A categories as per The Environment Conservation Rules, 1997	116.00	2.13
06	Heavy Industrial Zone	Other toxic and pollutions Industries (Orange B and Red categories as per The Environment Conservation Rules, 1997)	26.92	0.49
07	Government Office	All kinds of educational institutes like Primary/secondary/ other Schools/ Colleges etc. are mentioned to calculate the land use for education and research purpose.	15.78	0.29
08	Education & Research Zone	All kinds of educational institutes like Primary/secondary/ other Schools/ Colleges etc. are mentioned to calculate the land use for education and research purpose.	24.99*	0.46
09	Agriculture Zone	Agricultural land denotes the land suitable for agricultural production, both crops and livestock. It is one of the main resources in agriculture. It includes productive land (single, double and triple cropped), seed bed, fisheries, poultry farm, dairy farm, nursery, horticulture etc.	2784.77	51.16
10	Waterbody	Equal or More than 0.25 acre and justification by the consultant and wet land will merge with water body	199.52	3.67
11	Open Space	Playground, Botanical Garden, Stadium, Zoo etc. (Facilities without or with	52.02	0.96
12	Recreational Facilities	Utility services include Overhead Tank ,Power Office/Control Room, Public Toilet, Sewerage	0.29	0.01

Sl. No.	Land use Category	Remarks	Area (Acres)	%
		Office, Waste Disposal ,Fire Service, Water Pump House ,Water Reservoir, Water Treatment Plant etc.		
13	Circulation Network	Road and Rail communication	406.26	7.46
14	Transportation Facilities	Under transport and communication land use both transport and communication services are considered. This category includes airport, bus terminal/ stand, ferry ghat, filling station, garage, launch terminal, post office, passenger shed, telephone exchange, ticket counter, transport office etc.	11.06	0.20
15	Utility Services	Utility services include Overhead Tank ,Power Office/Control Room, Public Toilet, Sewerage Office, Waste Disposal, Fire Service, Water Pump House ,Water Reservoir, Water Treatment Plant etc.	13.42	0.25
16	Health Facilities	Utility services include Overhead Tank ,Power Office/Control Room, Public Toilet, Sewerage Office, Waste Disposal, Fire Service, Water Pump House ,Water Reservoir, Water Treatment Plant etc.	5.55**	0.10
17	Community Facilities	All community facilities including funeral places and other religious	18.18	0.33
18	Historical and Heritage Site	The entire mentionable historical and heritage site.	0.00	0.00
19	Restricted Area	A Restricted Area is an area where no one but certain people can enter. Here the areas which are not accessible for the general public except some high ranked personnel are considered as restricted area.	0.16	0.00
20	Overlay	If the consultant justify any area that should not be defined as other given definitions but the facility(s) may not be avoidable, they may use this category	0.00	0.00
21	Urban Deferred	Optional depending on the Paurashava and the Consultant's judgment	121.65	2.23
22	Forest	Designated Forest Area	0.00	0.00
23	Beach	Sea Beach	0.00	0.00
24	Miscellaneous	Any other categories which are not related to above 23 categories.	2.01	0.05
Grand Total			5443.71	100.00

* 0.3 acres for primary schools, 18.94 acres for secondary schools and 18.94 acres for college are not feasible according to the planning team

** 20.43 acres for health facilities is not feasible according to the planning team because there are some health services in mixed used categories

So, special consideration of landuse is applied by the planning team with the opinion of PMO and local people to make the landuse plan feasible at present time.

In the sections below, the general definition of the use and description of associated permitted and conditionally permitted uses under each land use zone have been provided. The uses that are not listed here in any of the categories shall be treated as Restricted Use for the corresponding land use category and shall not be permitted only except unanimously decided otherwise by the appropriate authority. In such situations, the use shall get permission in the category of New Use. The following is a short description of recommended land use zones.

Urban Residential Zone

Present residential area of Kaliganj Paurashava is 11 persons per acre (ppa) gross density and 69 net density. As per the population projection in 2031 planning year gross density within will be 19 ppa and net density within the existing residential area will be 104 ppa. To ensure livable urban environment and efficiently provide civic facilities density of Kaliganj will be control through providing two type of residential area, namely urban residential zone and rural settlement. It is suggested that ppa of urban residential zone will be 100. In case of Kaliganj Paurashava, urban residential zone covers 1048.69 (19.26%) acres of land delineated up to the year 2031, considering standard provided by LGED. It will encourage dense residential development near the core area. Table A.1, Annexure- A and conditional permission will be given to a number of other land uses as specified on Table A.2, Annexure-A.

Rural Settlement

Kaliganj Paurashava has some rural characteristics. So in Urban Area Land use category for UTIDP Master Plan the residential settlements within the agricultural belt are categorized as rural settlements. These settlements have usually temporary type of structures. Total 69.89% existing land use is in agriculture practice and most of the settlement situated surrounding or within this agricultural land. So in a manner to control development in Kaliganj a portion of land declare as rural settlement. This settlement occupies 530.86 acre of land, which comprises more than 9.75% of the total land. The areas of rural settlement have some restrictions for non-agricultural development. Suggested density in this zone will be within 50 ppa. Table A7, Annexure-A shows the permitted land use of rural settlement and Table A8, Annexure-A conditionally permitted use in this zone.

Map 10.2: Land Use Proposal for Kaliganj Paurashava

Commercial Zone

The commercial zone is intended to provide locations, where commercial activities including retails and wholesale can be set up and function without creating hazards to surrounding land uses. This zone has an area of 35.46 acre (0.65%) designated up to 2031 and zone will allow commercial uses as listed in Table A.5, Annexure- A, and conditional uses as listed in Table A.6, Annexure- A. Again, the following table shows the new land proposal for commercial in Kaliganj Paurashava.

Table 10.13: New Land Proposal for Commercial Activity Area

Ward No.	Development Proposal Name	DP ID	Area (Acres)	Mouza Name	JL No.	Sheet No.	Plot No.
Ward 1	Neighborhood Market	NM-01	0.33	Kaliganj,	17	2	821, 822, 823, 825
		NM-02	0.77	Kaliganj,	17	2	659, 660
Ward 2	Neighborhood Market	NM-03	0.82	Foila	29	0	18
		NM-04	0.40	Paikpara	14	0	102, 103
		NM-05	0.15	Bakulia	16	0	285, 286, 288
Ward 3	Neighborhood Market	NM-06	0.30	Foila	29	0	576, 577
Ward 4	Neighborhood Market	NM-07	0.39	Helai	34	0	453
Ward 5	Neighborhood Market	NM-08	0.61	Nischintapur	36	2	373, 375
	Paurashava Market	PM-01	0.87	Nischintapur	36	1	133, 135, 136, 137, 140, 141, 144
Ward 7	Neighborhood Market	NM-09	0.19	Arapara	28	0	240, 241, 242, 473
Ward 8	Neighborhood Market	NM-10	0.29	Babra	70	1	420
				Babra	70	2	1101, 1105
Ward 9	Gorur Hat	GH-01	4.63	Shibnagar	27	0	110, 116, 117, 118, 119, 120, 121, 142, 144, 145, 146, 147, 148, 149, 9999
	Neighborhood Market	NM-11	0.22	Shibnagar	27	0	399, 402
Total: 9.97 Acres							

Mixed Use Zone

Mixed use zones have been recommended to allow some flexibility in development. In a small town like Kaliganj, as the trend shows, an exclusive commercial land use is unlikely to function. Admixture of land uses will allow flexibility of development, instead of restricting development. Total area for mixed uses has been put to 27.40 acre (0.50%) including both, existing and proposed land uses. This zone will allow residential structures together with commercial uses as listed in Table A.11, Annexure-A, and conditional uses as listed in Table A.12, Annexure- A.

Ward/Civic center will treated as the hub of local civic functions and it will provide the following facilities as per the requirements of the locality:

- Counselor office
- Community Center
- Community Clinic

- Post Box
- Police Box
- Small shops
- Club and
- Office of Utility Services

Table 10. 14: New Land Proposal for Mixed Use Area

Ward No.	Type of Facilities	DP ID	Area in Acre	Mouza Name	JL No.	Sheet No.	Plot No.	Phase-wise development		
								First Phase (1st to 5th yr)	Second Phase (6th to 10th yr)	Beyond 10th year
Ward 1	Ward Councilor's office	WC-01	0.88	Kaliganj	17	2	433, 434, 435, 436, 437, 438, 825	Land acquisition and establish	Provide more facilities	Readjust with new facilities if required
Ward 2	Ward Councilor's office	WC-02	0.61	Paikpara	14	0	152	Land acquisition and establish		Continue the development
Ward 3	Ward Councilor's office	WC-03	0.39	Foila	29	0	274	Land acquisition and establish	Provide more facilities	Readjust with new facilities if required
Ward 4	Ward Councilor's office	WC-04	0.39	Helai	34	0	504, 511	Land acquisition and establish		Continue the development
Ward 5	Ward Councilor's office	WC-05	0.50	Nischintapur	36	1	294	Land acquisition and establish		Continue the development
			0.49	Nischintapur	36	2	335			
Ward 6	Ward Councilor's office	WC-06	0.44	Nischintapur	36	2	614	Land acquisition and establish	Provide more facilities	Readjust with new facilities if required
Ward 7	Ward Councilor's office	WC-07	0.43	Arapara	28	0	152	Land acquisition and establish	Provide more facilities	Readjust with new facilities if required
Ward 8	Ward Councilor's office	WC-08	1.94	Babra	70	1	576, 578, 579	Land acquisition and establish	Provide more facilities	Readjust with new facilities if required
Ward 9	Ward Councilor's office	WC-09	0.35	Shibnagar	27	0	430, 431, 432, 663	Land acquisition and establish	Provide more facilities	Readjust with new facilities if required
Total: 6.42 Acres										

General Industrial Zone

General industrial area is intended to provide locations, where general industrial, manufacturing and processing establishments can be set up and function without creating hazards to surrounding land uses. As a small urban center, it is unlikely that any major

industrial concern will find its place here in immediate future. This zone has an area of 116.00 acre (2.13%) with general industries designated up to 2031. Availability of land, road way and railway communication and easy accessibility to the market are the prime concern to choice the location of general industrial area. In this zone, a complex line of industrial and supporting non-industrial land uses will be permitted as per Table A.3, Annexure- A and conditional permission will be given to a number of other land uses as specified on Table A.4, Annexure- A.

Table 10.15: New Land Proposal for General Industrial Area

Ward No.	Type of Facilities	DP ID	Area in Acre	Mouza Name	JL No.	Sheet No.	Plot No.	Phase-wise development		
								First Phase (1st to 5th yr)	Second Phase (6th to 10th yr)	Beyond 10th year
Ward 6	General Industrial Zone	GI-01	7.21	Nischintapur	36	02	757-761, 1033- 1036, 1040, 1042-1049, 1050, 1052	Land acquisition and developed basic infrastructure	Establish Industry	Ensure full functioning of industrial area
		GI-02	15.37	Nischintapur	36	02	1039-1041, 1050-1059, 1103, 1105, 1107-1124, 1126, 1130-1136, 1181, 1183-1190, 1609-1611			
Total: 22.58 Acres										

Heavy Industrial Zone

This zone has an area of 26.92 acres (0.49%) for heavy industries designated up to 2031. Availability of land, road way and railway communication and easy accessibility to the market are the prime concern to flourish heavy industry in this area. Since there is no industrial agglomeration in the town, the industrial zone will be meant for new industries. In this zone, a complex line of industrial and supporting non-industrial land uses will be permitted as per Table A.3, Annexure- A and conditional permission will be given to a number of other land uses as specified on Table A.4, Annexure- A. Again the following table shows new land proposal for manufacturing and processing activity in Kaliganj Paurashava. This land will be used for established general industrial area.

Table 10.16: New Land Proposal for Heavy Industrial Area

Ward No.	Type of Facilities	DP ID	Area in Acre	Mouza Name	JL No.	Sheet No.	Plot No.	Phase-wise development		
								First Phase (1st to 5th yr)	Second Phase (6th to 10th yr)	Beyond 10th year
Ward 1	Heavy Industrial Area	HIA-01	19.13	Sreerampur	18	0	600, 611, 612, 628, 714-781, 791-802, 803, 817, 818,	Land acquisition and developed basic infrastructure	Establish Industry	Ensure full functioning of industrial area

Ward No.	Type of Facilities	DP ID	Area in Acre	Mouza Name	JL No.	Sheet No.	Plot No.	Phase-wise development		
								First Phase (1st to 5th yr)	Second Phase (6th to 10th yr)	Beyond 10th year
							861, 865-868, 1045, 1046, 1047			
		HIA-02	7.76	Sreerampur	18	0	644, 645, 648, 649-671			
Total: 26.89 Acres										

Governmental Services

Administrative zone covers all kinds of government and non-government offices in the town. The permitted use in this zone is presented in Table A.15, Annexure- A and conditional uses as listed in Table A.16, Annexure- A. The total area under this use has been estimated as 15.78 acres (0.29%).

Table 10.17: New Land Proposal for Governmental Services Area

Ward No.	Type of Facilities	DP ID	Area in Acre	Mouza Name	JL No.	Sheet No.	Plot No.	Phase-wise development		
								First Phase (1st to 5th yr)	Second Phase (6th to 10th yr)	Beyond 10th year
Ward 9	BCIC	B-01	19.13	Shibnagar	27	0	300, 524	Land acquisition and developed basic infrastructure	Establish Industry	Ensure full functioning of industrial area
Total: 19.13 Acres										

Education and Research Zone

Education and Research Zone refers to mainly education, health and other social service facilities as listed in Table A.13, Annexure-A, and conditional uses as listed in Table A.14, Annexure-A. The total area under this use has been proposed 24.99 acres of land. Total two primary schools, two high schools, extension of existing high school and one vocational training institute will be established in this land.

Table 10.18: New Land Proposal for Education and Research Zone

Ward No.	Type of Facilities	DP ID	Area in Acre	Mouza Name	JL No.	Sheet No.	Plot No.
1	Primary school	PS-01	0.32	Kaliganj	17	2	753
2	Primary school	PS-02	1.58	Kaliganj	17	2	869, 874, 875, 886
2	Secondary School	SS-01	2.23	Khayertal	15	0	70-72, 81, 279, 289-294
3	Primary school	PS-03	0.18	Foila	29	0	597, 598
5	Secondary	SS-02	0.43	Nischintapur	36	1	147, 148, 149, 1226

Ward No.	Type of Facilities	DP ID	Area in Acre	Mouza Name	JL No.	Sheet No.	Plot No.
	School						
8	Secondary School	SS-03	0.38	Babra	70	2	1125
9	Primary school	PS-04	1.54	Shibnagar	27	0	76, 79, 80, 81, 109, 112
9	Secondary School	SS-04	1.14	Shibnagar	27	0	382- 393
Total: 7.8 Acres							

Agriculture Area/ Agricultural Zone

The Paurashava has a vast area of agricultural land that demands formation of a separate zone of, agriculture. Agriculture zone is primarily meant for agriculture; land uses related to it and land uses that support it. Details of land uses are presented in Table A.17, Annexure- A and conditional uses as listed in Table A.18, Annexure- A. The total area under this use has been estimated as 2784.77 acres that include existing and proposed land uses.

Water Body and Retention Area

The planning area has 199.52 acre of water body within the Paurashava. The plan suggests preserving most of these water bodies for two purposes, first, to serve as source of water, second to serve as water retention area during monsoon. The ponds with an area equal to or more than 0.25 acre will be preserved as the water retention ponds. There will be permitted uses in this zone as stated in Table A.23, Annexure- A and some other uses may conditionally be permitted as stated in Table-A.24, Annexure- A

Open Space

This zone has been provided to meet the active and passive recreational needs of the people and at the same time, conserve the natural resources. The total area estimated for this zone stands at 52.02 acres (0.96%). The details of permitted and conditional permits have been presented in Table A.19 Annexure- A, and conditional uses as listed in Table- A.20, Annexure- A. Table 10.11 shows the detail of new land proposal for recreational land proposal in Kaliganj Paurashava.

Table 10.19: New Land Proposal for Open Space

Ward No.	Type of Facilities	DP ID	Area in Acre	Mouza Name	JL No.	Sheet No.	Plot No.	Phase-wise development		
								First Phase (1st to 5th yr)	Second Phase (6th to 10th yr)	Beyond 10th year
1	Central Park	CP-01	18.20	Kaliganj	17	2	682, 719, 720, 724, 725, 729, 731- 743, 779- 809, 825, 1088, 1097	Land acquisition and establish	Maintaining and improve facilities within the park.	
1	Park	P-01	1.02	Kaliganj	17	2	1097	Land acquisition and establishment		Maintain ing and improve facilities within
		P-02	0.74	Kaliganj	17	2	1031- 1034, 1071			

Ward No.	Type of Facilities	DP ID	Area in Acre	Mouza Name	JL No.	Sheet No.	Plot No.	Phase-wise development		
								First Phase (1st to 5th yr)	Second Phase (6th to 10th yr)	Beyond 10th year
										the park.
1	Stadium	S-01	7.20	Kaliganj	17	2	253, 256, 281- 290, 292-298, 335-339, 345	Land acquisition and establishment		Maintaining the playground and improve facilities
2	Playground	PG-01	1.43	Khayertal	15	0	277, 279, 280, 281	Land acquisition and establishment		Maintaining and improve facilities within the park.
3	Park	P-03	2.81	Foila	29	0	630, 631, 634, 635, 636, 637, 912, 913, 9999, 99999	Land acquisition and establishment		Maintaining and improve facilities within the park.
		P-07		Kaliganj	17	2	1097	Land acquisition and establishment		Maintaining and improve facilities within the park.
3	Playground	PG-02	0.95	Foila	29	0	658, 659	Land acquisition and establishment		Maintaining and improve facilities within the park.
5	Park	P-07	0.06	Foila	29	0	99999	Land acquisition and establishment		Maintaining and improve facilities
5	Playground	PG-03	0.79	Nischintapur	36	1	137, 141, 142, 1224, 1225, 1226	Land acquisition and establishment		Maintaining and improve facilities within the park.
6	Neighborhood park	NP-01	0.09	Nischintapur	36	2	1222	Land acquisition and establish		Maintaining and improve facilities within the park.
8	Playground	PG-04	0.53	Babra	70	1	428, 558, 586, 587, 588	Land acquisition and establishment		Maintaining the playground and improve facilities
9	Central Park	CP-01	1.34	Kaliganj	17	2	682, 724, 735, 740, 741, 742, 786, 788-791, 793, 794, 795, 797-802, 1097	Land acquisition and establishment		Maintaining and improve facilities within the park.
		CP-02		Shibnagar	27	0	450			Maintaining the playground and improve facilities
9	Park	P-09	9.10	Kaliganj	17	2	682, 1097	Land acquisition and		Maintaining and improve facilities within the park.

Ward No.	Type of Facilities	DP ID	Area in Acre	Mouza Name	JL No.	Sheet No.	Plot No.	Phase-wise development		
								First Phase (1st to 5th yr)	Second Phase (6th to 10th yr)	Beyond 10th year
								establish		
		P-10		Sreera mpur	18	0	793, 865, 866, 869, 1042, 1043, 1044, 1045, 1046, 1047	Land acquisition and establish	Maintaining and improve facilities within the park.	
Total : 44.26 Acres										

Circulation Network

The road network is mainly considered as circulation network. National highway, pucca/ semi- pucca/ katcha road, footpath, flyover, over- bridge, underpass, bridge, culvert, railway, railway bridge all are include in circulation network. Total 406.26 acre land which covers 7.46% of total planning area. At present 86.19 acre of land uses for circulation network in this Paurashava. Annexure-C shows the planning schedule of Circulation Network in Kaliganj Paurashava.

Transportation Facilities

Transportation facilities incorporate transport and communication services. For an example airport, bus terminal/ stand, ferry ghat, filling station and garage, launch terminal, post office, passenger shed, telephone exchange, ticket counter, transport office etc. Total 11.06 acres land (0.20% of total area) will be used for this purpose. Table 10.12 shows the new transportation facilities for Kaliganj Paurashava.

Table 10.20: New Development Proposal for Transportation Facilities

Ward No.	Type of Facilities	DP ID	Area in Acre	Mouza Name	JL No.	Sheet No.	Plot No.	Phase-wise development	
								First Phase (1 st to 5 th yr)	Second Phase (6 th to 10 th yr)
1	Bus terminal	BT-01	5.65	Kaliganj	17	2	404, 414-422, 561, 562, 565, 566, 569-581, 584	Land acquisition and establishment	Maintaining and improve facilities
1	Tempo Stand	TS-01	0.36	Kaliganj	17	2	341	Land acquisition and establishment	Maintaining and improve facilities
2	Tempo Stand	TS-02	0.53	Kaliganj	17	2	929, 930	Land acquisition and establishment	Maintaining and improve facilities
		TS-03		Paikpara	14	0	146, 147	Land acquisition and establishment	Maintaining and improve facilities

Ward No.	Type of Facilities	DP ID	Area in Acre	Mouza Name	JL No.	Sheet No.	Plot No.	Phase-wise development	
								First Phase (1 st to 5 th yr)	Second Phase (6 th to 10 th yr)
3	Tempo Stand	TS-04	0.19	Foila	29	0	516	Land acquisition and establishment	Maintaining and improve facilities
6	Tempo Stand	TS-05	0.07	Nischintapur	36	2	521, 1238	Land acquisition and establishment	Maintaining and improve facilities
6	Truck Terminal	TT-01	2.89	Nischintapur	36	2	1191, 1193, 1198, 1199, 1201-1204	Land acquisition and establishment	Maintaining and improve facilities
9	Tempo Stand	TS-06	0.23	Shibnagar	27	0	508	Land acquisition and establishment	Maintaining and improve facilities
Total : 9.92 Acres									

Utility Services

It incorporated all utilities and service facilities except the health service. For an example water treatment plant, water reservoir, water pump house, public toilet, fire service, waste disposal, sewerage office, power office or control room and overhead tank. In survey stage this type land use was define as service activity. Total 13.42 acres land which covers 0.25 % total area of Kaliganj Paurashava. Total two Surface Water Treatment Plant, one Waste Dumping Ground, one Effluent Treatment Plant for industrial waste water treatment and seven Waste Transfer Stations will be newly established to fulfill the desired need of Kaliganj Paurashava. Table 10.13 shows the new land proposal for utility services in Kaliganj Paurashava.

Table 10.21: New Land Use Proposal for Utility Services

Ward No.	Type of Facilities	DP ID	Area in Acre	Mouza Name	JL No.	Sheet No.	Plot No.	Phase-wise development		
								First Phase (1 st to 5 th yr)	Second Phase (6 th to 10 th yr)	Beyond 10 th year)
1	ETP	ETP-01	0.33	Sreerampur	18	0	1042 - 1044	Land acquisition and establishment	Maintaining and improve facilities	Maintaining and improve facilities
1	Surface water Treatment	WTP-01	2.74	Kaliganj	17	2	810-812, 815, 816, 1097			
1	Waste Transfer Center	WTC-01	0.04	Sreerampur	18	0	524			
2	Slaughter House	SH-01	0.05	Foila	29	0	17			
2	Waste Transfer Center	WTC-02	0.17	Khayertal	15	0	42,9 8,99, 103, 104			

Ward No.	Type of Facilities	DP ID	Area in Acre	Mouza Name	JL No.	Sheet No.	Plot No.	Phase-wise development		
								First Phase (1 st to 5 th yr)	Second Phase (6 th to 10 th yr)	Beyond 10 th year)
3	Waste Transfer Center	WTC -03	0.02	Foila	29	0	594			
4	Dumping Station	DS-01	8.56	Helai	34	0	297, 303-320, 754, 755, 782		Land acquisition and establishment	Maintaining and improve facilities
5	Surface water Treatment	WTP -02	1.21	Nischintapur	36	1	202, 206		Land acquisition and establishment	Land acquisition and establishment Maintaining and improve facilities
5	Waste Transfer Center	WTC -04	0.02	Nischintapur	36	2	344			
6	Slaughter House	SH-02	0.15	Nischintapur	36	2	588			
6	Waste Transfer Center	WTC -05	0.02	Nischintapur	36	2	541			
8	Waste Transfer Center	WTC -06	0.01	Nischintapur	36	3	1291			
9	Slaughter House	SH-03	0.06	Sreerampur	18	0	402			
Total : 13.38 Acres										

Health Services

Total 5.55 acres land will use for health services in Kaliganj Paurashava, which covers 0.10% total land of planning area. Community based health center and maternity clinic will be establish in each ward center.

Table 10. 22: New Land Use Proposal for Health Services

Ward No.	Name of Facilities	DP ID	Area in Acre	Mouza Name	JL No.	Sheet No.	Plot No.	Phase-wise development		
								First Phase (1 st to 5 th yr)	Second Phase (6 th to 10 th yr)	Beyond 10 th year)
1	Maternity Clinic	MC -01	0.90	Sreerampur	18	0	486-488	Land acquisition and establishment	Maintaining and improve facilities	-
2	Maternity Clinic	MC -02	0.97	Bakulia	16	0	309, 417, 419-424			
				Khayer tala	15	0	143-145			
4	Maternity Clinic	MC -03	0.23	Helai	34	0	578	-	Land acquisition and establishment	Maintaining and improve facilities
6	Maternity Clinic	MC -04	0.65	Nischintapur	36	02	432, 440, 446-448, 504	-		Land acquisition and establishment
7	Eye	EH-	0.89	Arpara	28	0	138,	Land	Maintaini	-

Ward No.	Name of Facilities	DP ID	Area in Acre	Mouza Name	JL No.	Sheet No.	Plot No.	Phase-wise development		
								First Phase (1 st to 5 th yr)	Second Phase (6 th to 10 th yr)	Beyond 10 th year
	Hospital	01					145	acquisition and establishment	ng and improve facilities	
8	Maternity Clinic	MC-05	1.42	Babra	70	1	456, 535, 539, 541, 542, 558, 561, 565	-		Land acquisition and establishment
9	Maternity Clinic	MC-06	0.49	Shibnagar	27	0	499, 663	-	Land acquisition and establishment	Maintaining and improve facilities
Total : 5.55 Acres										

Community Facilities

Community services include community centre, club house, fire service, health facilities, religious centres, other community services etc. In additionally all funeral places and other religious uses incorporated in this category. Total 18.18 acres land which covers 0.33% of total planning area will be used for this purpose.

Table 10. 23: New Land Use Proposal for Community Facilities

Ward No.	Type of Facilities	DP ID	Area in Acre	Mouza Name	JL No.	Sheet No.	Plot No.	Phase-wise development		
								First Phase (1st to 5th yr)	Second Phase (6th to 10th yr)	Beyond 10th year
5	Community center	C-01	0.98	Nischintapur	36	1	179, 180	Land acquisition	Establishment	Ensure full functioning of industrial area
9	Community center	C-02	0.65	Shibnagar	27	0	337, 338	-	Land acquisition	Establishment
Total: 1.63 Acres										

Urban Deferred

The Urban Deferred refers to lands lying outside of the urban growth boundary and identified as Urban Reserve. The total area under this use has been proposed as 121.65 acres (2.23%) that include existing and proposed land uses. The following are permitted Uses within the Urban Reserve (UR) Zone:

- Agriculture, Livestock based
- Agriculture, Vegetation based (mushroom farms shall not be permitted)
- Existing facilities up to the date of gazette notification of the Master Plan. Condition is that, no further extension will be permitted.

10.2.3 Land Use Permission

One of the major purposes of land use zoning is to restrict an area for a particular use meant for the zone. This is intended to maintain a disciplined land use distribution and development. But there are many uses other than the use meant for the zone that are considered permitted in the zone. Sometimes such applications are accommodated to support or assist the area, with conditions imposed in giving land use permit, sometimes strict restrictions are maintained by refusal of applications. Detailed lists of permissible and conditionally permissible uses have been provided in Annexure- A according to land use categories. The list has been developed with ideas borrowed from the recommendations made by the consultants under the recently completed DAP Project of RAJUK. It is required that permit procedures mentioned in Annexure- A are officially adopted through incorporation in the Building Construction Rules under Section 18 of the East Bengal Building Construction Act 1952.

Development Permit is the most important function of Paurashava. Master plan will have no bearing unless development can be channelized to its desirable direction through effective permit procedure. Master plan has developed its plan using GIS database and other advanced computer software of world standard. The necessary planner to handle this database is sufficiently available in the country. This combination provides Paurashava the unique opportunity to make its plan permit procedure fast, well managed and transparent. This is also in line with the idea of digital Bangladesh pronounced by the present govt.

a. Computerization of the Permit procedure

Maintaining information of all the development activities within the Paurashava jurisdiction is a mammoth task and maintain them in the present manual method is neither possible nor necessary. Consultant recommends development of customize software for the purpose. The system would prove worthwhile by saving in the form of time, cost, ease of management, ease of upgrading information, control of corruption and so forth.

b. Land use Permit

Paurashava has the legal responsibility to develop plan for the wellbeing of the citizens within its jurisdiction and implement the same by channelizing all developments through appropriate control mechanisms. Issue Plan Permit to private plot owner/s or developers working with the consent of the owner/s that comply the set regulations constitute the most part of development control activity conducted by Paurashava. In the following paragraphs the structures of the proposed land use control Authority has been elaborated considering that Paurashava shall be strengthened adequately and in that situation planner's ranks would be as under (Proposed organogram of BIP) was given in Section 8.1.3.2, Chapter 8, and Part A of this report.

Structure of Land use Permit Authority

The Land use Permit Authority shall be comprised of three vertically linked tiers:

- At the entry level Land use Permit Planner [LPP]
- At the mid-level Land use Permit Committee [LPC] to control LPPs, clarify legal provisions regarding land use permit decisions on a case to case basis, and

- At the top level Paurashava Esthayee (permanent) Committee (Town Planning) comprised of representatives from planning departments, professional institutions, imminent scholars and citizens of the town.

Land use Permit Planner

Land use Permit will be issued with the signature of Land use Permit Planner [LPP] appointed by the Mayor, Paurashava from among the Planners not below the rank of Assistant Town Planner. Land use Permit issued by the LPP/s shall be considered null and void, even if signed, unless the use sought for, is in conformity with the land use options of the respective zone that contains the plot.

To cover the Paurashava area, Paurashava Planners [PP] working in the Paurashava may be delegated with the power to act as LPP and issue Plan Permit and control development within the provision of Master plan on behalf of Paurashava. He/she must have needful Inspectors and GIS facility with logistics and knowledgeable personnel to operate so as to accomplish such responsible job. For all plan permit activities PPs shall be accountable to, controlled by and act in close communication with Land use Permit Committee at Paurashava.

Land use Permit Committee

At the mid-level Land use Permit Committee [LPC] shall function for effective control of LPPs [both main stream and Paurashava] and to clarify legal provisions regarding land use permit decisions on a case to case basis. The activities of LPC will include

- Clarify the legal provisions for the LPPs as per their request.
- Make recommendations in case of New Use or Conditional Use and send it to the Paurashava Esthayee Committee for decision.

Earmark plot numbers under non-conforming uses and notify the owners about the time span to relocate the facility, procedure and conditions that must be strictly maintained to avoid immediate eviction.

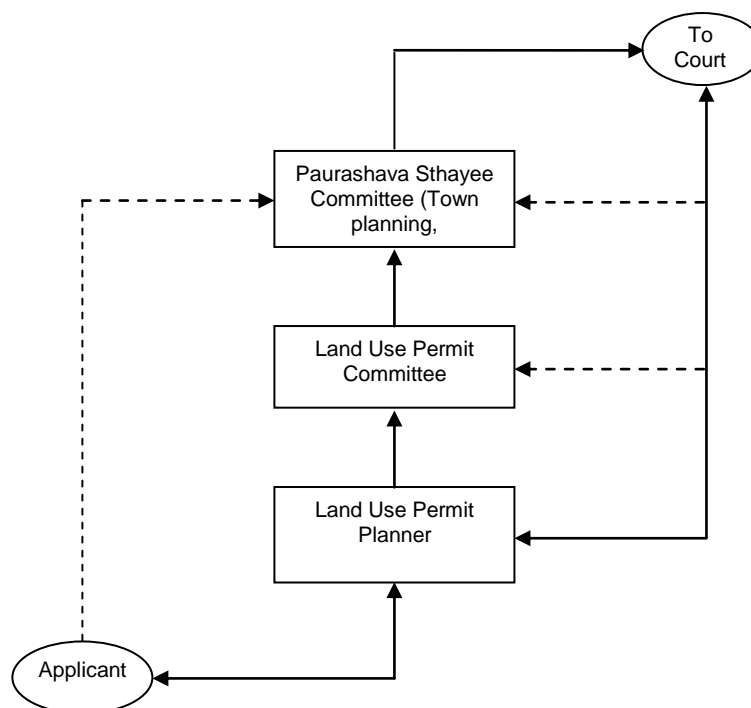


Figure 10.1: Structure of Land use Permit Authority Showing Linkages

Paurashava Sthayee Committee (Town Planning, Public services and development)

According to the Local Government (Paurashava) Act, 2009, section 64 Paurashava Esthayee Committee (Town Planning, Public services and development) shall be the supreme authority regarding Land Use Permit within Paurashava jurisdiction. This Committee will have five Members. The committee will form according to the section 55 of Local Government (Paurashava) Act, 2009.

The Committee shall be well supported by a secretariat and shall be empowered both authoritatively and financially to carry out study and/or survey, arrange public hearing, round table conference, seminar, or if necessary, engage experts.

The Committee shall decide whether the proposed New Uses should be permitted or denied; in case of Conditional Permit impose the conditions to comply; accept variances for specific cases and so forth. Besides, the Committee shall decide strict conditions to nonconforming uses and the action against its violation if it so happens.

Land use Permit Option:

For a plot seeking land use permit there can be three possible options:

- Land use permitted
- Land use conditionally permitted, or
- Land use restricted

Land use Permitted

Land use that unconditionally permitted in the zone is listed in this category. When permission is sought for a residential land use on a plot earmarked as urban residential zone then it falls under this category.

Land use Permitted with Condition

Land use that generally is not incompatible or harmful for the community but whose number, location or specific use nature may pose threat to community's lifestyle, privacy, safety or security etc. then the land use is permitted but with a condition to fulfill so that the potential threat is avoided. For example, in a Residential-General Industrial Mixed use zone a request is made seeking land use permit for a composite textile mill with a dyeing unit. Since the use is compatible in the zone except for the release of noxious effluent to the surrounding, the permit may be issued with a pre-condition to exclude the dyeing unit in order to get land use permit. Now, following the formal agreement by the applicant to comply with the condition the permit is issued against the plot. A list of such conditional uses is maintained in this category.

Land Use Restricted

Land use that is harmful for the community are restricted by law. Such harmful land use is listed in this category. A cinema hall in a neighborhood may be cited as an example under this category. But for convenience, any use not listed in the permitted and conditionally permitted use category is considered as restricted for the zone.

Land use Permit Procedures

Land use permit procedure is a product of a number of interlinking activities. The whole process has been shown in a flow diagram for clearer understanding in Figure 10.2.

The procedure is commenced with the submission of formal application by the applicant to the Mayor of Paurashava. The applicant must submit along with other information and documents a mouza map showing his plot including plot no, mouza name etc. The concerned official designated as Land use Permit Planner (LPP), will then check the compliance of the land use desired by the applicant with the land use zone containing his plot and the uses permitted therein.

Four situations may be possible:

- Desired use is listed as Permitted in the zone
- Desired use overlaid
- Desired use is listed as Conditionally Permitted in the zone, and
- Desired use is not listed under any of the categories and may be permitted as New Use

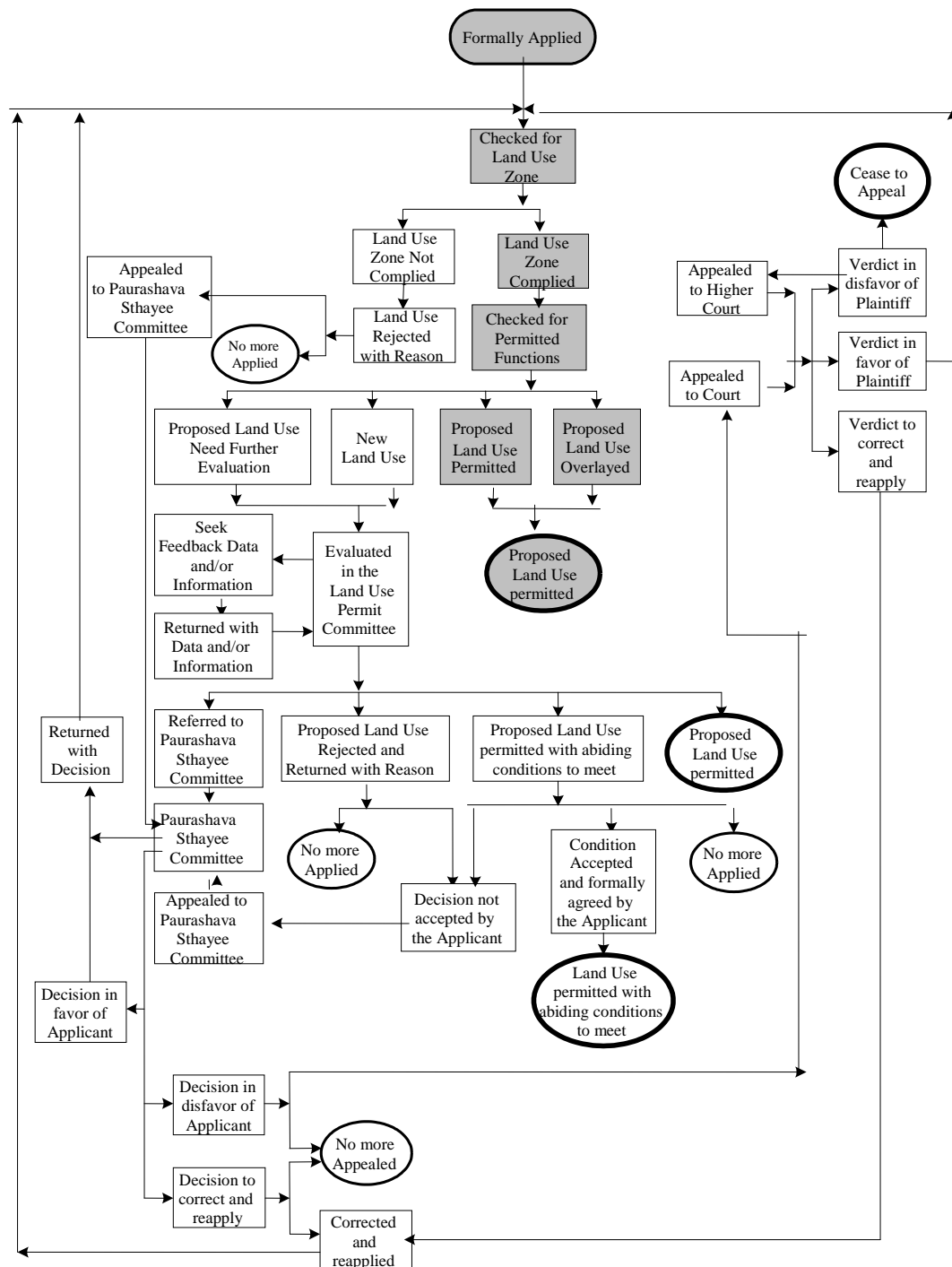


Figure 10.2: Flow Diagram Showing Activity Linkage of Plan Permit Procedure

If the desired use is listed as Permitted or Overlaid then it will be permitted without any question. If the desired use is listed as Conditionally Permitted the LPP would refer it to the LPC for further action.

In case of desired use not found in the permitted or conditionally permitted lists of the zone, the LPP shall reject the desired land use as it is not allowed in the zone. At this stage if the rejection decision taken by the LPP is not satisfactory to the applicant, he/she can appeal to the Paurashava Esthayee Committee. If the decision of the Committee goes in favor of the applicant, LPP shall then issue the permit. The Committee may also ask the applicant to make some modifications to make his/her claim appropriate for approval. The applicant may comply accordingly and apply afresh.

If the applicant is not satisfied with the decision of the Committee he/she may go to the court for decision.

If the LPP is convinced that the desired use should be allowed for the greater interest of the people and therefore, deserves to be considered under New Use category, he may recommend it to the LPC furnishing reasons in favor. The LPC if convinced by the reasoning will send the case to the Committee with recommendation to permit desired land use in the New Use category. Following necessary study and investigation if the Committee is also convinced about permitting the use as recommended by the LPC, they may decide so and authorize the LPP to issue permit for the desired land use in the New Use category.

10.3 Plan Implementation Strategies

This section deals with the issues of implementation of land use plan. Discussion is made on development regulation and recommendation on implementation, monitoring and evaluation of urban land use plan.

10.3.1 Land Development Regulations to implement the Land Use Plan

Urban planning regulations are necessary for the smooth functioning of land use plan. The land use regulations impact on planned development and result in social benefits and costs depending on their nature and the specific contexts in which they are applied. Careful reforms of these regulations can result in a lower cost for urban development and for housing. An additional benefit could be in terms of a more functional spatial organization of the town. Regulations and processes that facilitate land availability and uses for planned development at affordable costs need to be continued. Regulatory and process reforms can lead to.

- More compact towns, containment of urban sprawl, more efficient urban forms,
- Less costly urban infrastructure,
- More market-friendly development of urban land;
- More intensely used central areas, better efficiency of public transportation systems and decrease in trip length and transportation costs;
- Less violations in zoning, sub-division and building regulations, and reduction in non-conforming and non-compatible uses and slums;

- Reduction in difference between what is allowed under regulations and what is financially feasible due to land use reforms leading to reduced opportunities for corruption;
- Generally lower land prices in city/town but higher prices in some prime commercial and business districts driven by market forces;
- Average urban population densities likely to stay constant as more efficient land use consumption.

The following measures of Land Development Regulations should strictly be followed for the proper implementation of the Land use Plan.

a. Restriction on Use of Land Contrary to the Master Plan

No person shall use any land for any purpose other than that laid down in the land use zoning of the Master Plan approved by the Government. All future developments and constructions, both public and private within the area of Structure Plan shall be in conformity with the Master Plan approved by the Government. No compensation shall be payable to any person owing to demolition of any construction developed in violation of the Master Plan provisions.

b. Building Permission and Construction Approval

Development control mechanism will be one of the major plan implementation instruments to be carried out through the Building Construction Rules under Section 17 of the EBBC Act 1952 and the land use provisions of the Master Plan.

c. Building Permission in Proposed Development Areas

The Master Plan proposes a number of development projects. Many of the lands under these development projects have private ownership. No development in these lands by their owners will be allowed. They will remain in the present form till they are taken over by the respective authority for development or the development project is abandoned.

d. Parking in Commercial and Mixed Use Areas

For parking, BC Rules, 1996 has specific provisions for housing and commercial areas. But no provision has been suggested for mixed use areas. According to the rules for commercial area, 23 sq.m areas, has to be reserved for every 200 sq.m of commercial space. The consultant suggests that for mixed areas, BC Rules, 1996 meant for commercial area should also be applied to the mixed areas under the current plan.

f. Rules for Realization of Betterment Fee

The Ordinance enables Paurashava to charge betterment fees on land owners or any other person having interest in it for an increase in land value due to execution of any development scheme by the Authority. The Authority should develop appropriate procedures in this regard and get them approved to start charging betterment fee. Due to failure of execution of the powers of charging betterment fee, all benefits of land value enhancement due to Paurashava development projects goes to the land owner at the cost of the community. So it is not irrational for the road developer to demand a share of the benefit accruing to the land owner following road development.

g. Planning Rules for Real Estate Companies

With the increase in population, there will be further rise of land based real estate activities. But there is no provision in the Paurashava Ordinance to control the activities of real estate companies. It is needed that infrastructure and services provided in the housing plans of the real estate projects be standardized to secure interest of the buyers. Strict vigilance is needed against any fraudulent practices that might affect public interest.

However, any control imposed on the housing companies must be imbued with a positive approach, so that it does not affect the housing promotion activities of the private sector. The intention would be to allow them function under certain control that would secure public interest and at the same time will not discourage private investment in housing. The infrastructure, services and facilities provided in a housing project must be standardized. Road width and the land allocated for community facilities must be adequate to meet requirements of the future inhabitants. The infrastructure provided therein must follow minimum standard as someday these housing estates would become parts of the future town and the infrastructure provided therein would be used by a wide range of population of the town.

To control apartment development, the national rules under EBBC Act 1952 will be applied. The rules for land based real estate projects exist for Dhaka only. In anticipation of expansion of real estate projects, there is an urgent need to prepare a set of rules for small towns. The real estate companies seeking approval for their housing project layout plan must fulfill certain conditions as set in the rules. The set of rules is clearly described in the Private Residential Land Development Rule-2004.

h. Minimum Road Width

Building Construction Rules, 1996, should be amended in the following way by incorporating the minimum road width standard.

To ease future traffic movement, it is necessary to keep provision for wider roads in the present plan. It is an uphill task to widen roads after development has taken place along the road. So it is wiser to reserve wider right of way for new roads now. Building Construction Rules, 1996 has determined the minimum road width as 12 ft. or 3.65 meter for roads in general and approximately 10 ft. for private roads. The consultants feel that this standard is not enough in view of future increase in population density and traffic. For safeguarding and easing future traffic movement the consultants have set the minimum width for any road for common use as 20 ft. or 6 meter and 16 ft. or 4.77 meter for private roads. However, in the built up areas, where development has already blocked the scope for developing such wide roads, the consultant recommends the minimum road width provisions of BC Rules, 1996. The new road width provision will be applicable in new areas. In the areas, where there already exist roads of less than 20 ft., the land owners on either side of the road will equally share the space needed to increase the road width to 20 ft. The land owners must leave the space vacant for taking it over by the Paurashava for widening of the road at some later date. No proposal for construction should be permitted on the vacant space reserved for road widening though the land will remain under its current ownership till it is taken over by the authority. In the light of the above

recommendations, necessary amendment will have to be brought in the BC Rules, 1996 applicable to the secondary and small towns only.

i. Low Land, Pond and Drainage Path

No low land that retains water for certain period of the year can be filled up and no obstruction to natural or manmade drainage system shall be allowed. Prior permission of Kaliganj Paurashava will be required for filling up of any low lands. The Paurashava shall accord such permission based on prevailing laws. All ponds should not be allowed to be filled up as they are a good source of urban water supply as well as serve as open space. As per the Wetland Conservation Act 2000, the use of these water bodies cannot be changed without prior permission of the authority.

j. Security Areas - Cantonment, BDR, Police Stations

BDR, Police, etc. areas have to be safe guarded from any possible incompatible development.

k. Radio, Television, Water Treatment and Pump Station and Power Station Sites

The key point installations including radio, television, water treatment and pump station and power station sites will have to be safeguarded from any possible undesirable development around these areas that can endanger their security. No building except vegetation should be allowed within 183 meters around the transmission towers.

10.3.2 Implementation, Monitoring and Evaluation of the Land Use Plan

Monitoring and evaluation is a very important part of plan implementation. Monitoring helps check if the plan is being implemented properly. It also measures the level of implementation of the plan. If the plan implementation is not on track, corrective measures can be taken to put the execution on track. After expiry of any plan, evaluation is made about the errors and omissions. Such evaluation helps take corrective measures in the next plan. Such monitoring and evaluation must be carried out from within the Paurashava. But Kaliganj Paurashava is not equipped with qualified manpower to make such evaluation. Monitoring and evaluation of a plan is essentially, the responsibility of qualified and experienced planners. As there is no planner in the Paurashava, its monitoring of plan implementation will be seriously affected. However, plan evaluation can be accomplished by means of out sourcing.

Updating of Plans

The plan package needs to be updated regularly to make it respond to the spatial changes over time. But such updating would require relevant technical professional and fund that are highly lacking in Kaliganj Paurashava. There is no planner or planning section in the Paurashava. Updating would require service of senior level planners that Paurashava would not be able to provide. This service will have to be procured by out sourcing and the Paurashava is not even capable to accomplish this financially either. This will create problem when the plans or its components gets obsolete or need to be changed. Another problem would arise when the duration of plans ends. A new set of plans would have to be prepared replacing the old ones. This problem, however, can be overcome by undertaking another planning project by LGED. So, for regular updating and changes and plan implementation monitoring, the Paurashava should immediately move for setting up a

planning section with planner(s) and other staff. The section will not only look after planning, but will also be responsible for development control, estate management and project preparation. Since the planners would be qualified and skilled in computer operation, they can also help achieving automation of the Paurashava functions.

CHAPTER 11

TRANSPORTATION AND TRAFFIC MANAGEMENT PLAN

11.1 Introduction

The transportation system directs the urban development pattern. The performance of transportation system largely influences the economy and social progress of an area. It provides mobility to people, goods and services to their destination. It has linkages with other sectors of development and for a sustainable development of any area, its traffic and transportation system should be adequately addressed. The current chapter of the report is about Transportation and Traffic Management Plan covering the scope of improvement of the existing network and system and plan proposals for new development. The proposals on improvement and new development are made for the project area up to 2031. The report also provides the purpose and the role of Transportation and Traffic Management Plan and its relation with Structure Plan and Land Use Plan.

11.1.1 Approach and Methodology

Transport study provides special attention to urban transportation planning as it greatly influences the location decisions and travel behavior of people, goods and services. Transportation is critical for the efficiency of towns contributing to their productivity and economic growth. A good network of roads and other transportation mode coupled with an efficient transport management system makes a substantial contribution to the "working efficiency" of cities and towns and enables them to become catalysts for social and economic development. On the other hand, the impact of a poorly designed urban transport system is manifested in terms of traffic congestion, delays, accidents, high energy consumption, high pollution of the environment and inequitable access to services. A well-planned transportation system results in orderly urban growth, greater use of urban public transport, lower vehicular pollution, and shorter auto trips.

A comprehensive transportation study is undertaken to investigate the existing transportation infrastructure, transportation modes and modal share scenario of Kaliganj Paurashava and to estimate the anticipated transportation needs of the town up to the year 2031. Accordingly, the transportation study is conducted to determine the present travel patterns and the characteristics of existing transportation facilities to forecast the future travel demand and develop a transportation plan.

Standard methodology was followed for traffic study in the project area as per the Terms of Reference. A nine hour traffic counting was conducted to assess the traffic volume at the most important traffic point, the zero point of the town at Kaliganj. An origin-destination (O-D) survey was also conducted at the same point where origin and destination of the traffic passing through this point of the town were recorded. Speed and Delay survey has been done at 3 points on major local roads.

Bus and tempo fleet data were collected from local transport owners' offices like, Bus Owners' Association, Tempo Owners' Association. They also provided information about

routes, trips and movement data. Information about bus station and tempo station were collected from the respective owners' association and the Paurashava/District Administration. Year wise data of non-motorized traffic were collected from the Kaliganj Paurashava, where these vehicles are registered.

Data on road pattern and condition of roads with their problems and road width were collected from the physical feature survey and verified through field visit. Data were also collected from socio-economic survey of the households. Information on road ownership was collected from the Paurashava, LGED and RHD. The same sources also provided information about future road projects in and around the Paurashava. Information about traffic conflict and accident were collected from the field and from Thana (police station). Mapping of major roads has been done using physical feature survey data and by thorough reconnaissance survey of roads.

11.2 Existing Conditions of Transportation Facilities

This section describes existing transportation facilities namely roadway characteristics, modal share of vehicular traffic, level of service which incorporate degree of traffic congestion and delay and analysis existing deficiencies in transport sector of Kaliganj Paurashava.

11.2.1 Roadway Characteristics and Functional Classification

11.2.1.1 Major Road Network

Kaliganj is a small, almost oval shaped urban center that has developed as an old bazar. Numbers of major roads connect the town with different urban centers including district headquarters. Major roads start from an intersection at the center of the town, known as Bus Stand Mor. The four major roads coming from four different directions meet together at this area. The routes coming from different places are:

- Jessore to Kaliganj
- Kustia to Kaliganj
- Khalishpur to Kaliganj
- Kaliganj Bazar to Kaliganj

All the roads meet together at zero point of the town, at Kaliganj Bus Stand Mor. The roads from Jessore to Kaliganj are appeared from South direction, road from Khalishpur to Kaliganj is appeared from west direction, road from Kaliganj Bazar to Kaliganj is appeared from east direction road from Kustia to Kaliganj is appeared from north direction. Apart from major roads, a large number of local roads having width varying from 10 ft. to 15ft width, provide access to individual houses and establishments and connect them to major roads. Map 11.1 shows the road network of Kaliganj Paurashava.

11.2.1.2 Roads in Kaliganj Paurashava

According to the physical feature survey, the total length of roads in the Paurashava area is 109.79 km. There are katcha, semi-pucca and pucca roads within the Paurashava area. Table 11.1 shows the picture of road network of the Paurashava.

Table 11.1: Existing Road network in Kaliganj Paurashava

Type of Road	Length (km)	Percentage (%)
Pucca	55.75	50.78
Semi-pucca	34.71	31.61
Katcha	19.33	17.61
Total	109.79	100.00

Source: Physical Feature Survey, 2009

Roads of the Roads and Highways Department

The Paurashava has about 6.42 km of road within the town owned and maintained by the Roads and Highways Department (RHD). This road passes through the heart of the town to connect other urban centers and Dhaka via Jhinaidah and Kustia. The width of this road is 20 ft, while the right of way is 150 ft.

Roads of Local Government Engineering Department (LGED)

LGED maintains More than 6.49 km of roads within the Kaliganj Paurashava. These are Upazila Parishad Road, Dakbangla Road, Thana Road, Noldanga Road, Modhuganj Bazar etc.

Important Local Roads

The Paurashava has so far developed 97 km of pucca, semi-pucca and katcha roads within its area with different widths. The Paurashava is also responsible for maintaining these roads. The authority has named many of these roads after renowned local personalities.

11.2.2 Modal Share of vehicular traffic

Kaliganj Paurashava is a small town. Non-Motorized Transport (NMT) is currently dominating in the town's internal traffic. The traffic volume survey at Bus Stand Mor intersection presents that almost 68.69% traffic is NMT. The detailed scenario was described in Chapter 5, Section 5.3.5 of Kaliganj Survey Report.

11.2.3 Intensity of Traffic Volume

In order to investigate the nature of traffic movement and assess the volume of traffic the consultant has identified zero point of Kaliganj Bus Stand Mor intersection as the only major road intersection with in the Project Area for conducting the traffic volume survey. The consultant has designed a standard format for traffic volume survey (approved by LGED). Traffic volume survey shows more than 14894 traffic move through the intersection daily. Among these 9992 NMT and 4902 are MT vehicles. But, on a hat day, the traffic volume is more than 17536, where these 12479 NMT and 5057 are MT vehicles.

11.2.4 Level of Service: Degree of Traffic Congestion and Delay

11.2.4.1 Traffic Congestion

Traffic conflict is common and frequent in towns, where there is combination of transport vehicles-slow and fast-in the streets. Major conflicts occur in the places, where intensity of traffic movement is high, on street parking is made and on street loading or unloading of goods are taken place. The consultant studied the traffic movement all over the town and has identified three main points where the Traffic Conflict is the highest. These are located

at Bus Stand intersection on Kustia road, Nimtola Intersection on Jessore Road and Upazila Headquater road. At these points, the slow moving vehicles like, rickshaws and vans come in conflict with motor vehicles, creating traffic congestion. As the number of slow moving vehicles is higher the conflicts are usually frequent.

11.2.4.2 Delay

The delays occur due to stoppage are conveniently recorded by separate stop-watch. Special watches which can accumulate the delay time as the observer operates buttons find convenient for this purpose. The delays have been measured at the intersection of Kaliganj Bazar intersection. In addition to stop delays, the delays in Kaliganj town is caused by the interaction of various factors such as congestion, inadequacy of carriageway widths, mixed traffic conditions, parked vehicles and heavy pedestrian flow and such delays are called congestion delays or operational delays and are rather difficult to be measured precisely. It is observed that, peak period takes on average 10-15% excess time than off-peak period in Kaliganj Paurashava due to congestion, narrow road and improper design of roads.

Map 11.1: Existing Road Network of Kaliganj Paurashava

11.2.5 Facilities for Pedestrians

The town does not have any footpath anywhere. In small towns like Kaliganj, footpaths are usually absent, as it is given least priority in development program.

11.2.6 Analysis of Existing Deficiencies

11.2.6.1 Roadway capacity Deficiencies

As in any other small towns in Bangladesh, Kaliganj has also its own road and transportation deficiencies. A physical feature and traffic survey of major inter-sections revealed that none of these are properly designed. Traffic level is far behind the actual capacity of the junctions. Congestion is created by large number of slow moving rickshaws waiting for passengers at the inter-sections.

Narrow Road Width

Narrow width of roads and poor maintenance has marked by most respondents as major road problems in the town. About 28.95% of the respondents have pointed to the misery of road movement during monsoon when unpaved roads get muddy. Narrow width of roads is likely to become a major problem of traffic movement when the town grows and density of population increases in future. As field survey shows, most of the households suggested (83.42%) increasing and widening existing road.

11.2.6.2 Operation, Safety, Signal and other Deficiencies

Like any other Upazila town, Kaliganj Paurashava has no traffic management system. There is no traffic point and traffic island including road dividers and signal posts. There is also no traffic police. So the operation of traffic and road safety is yet to become an important traffic issue.

11.2.7 Condition of other Mode of Transport (Rail/Water/Air)

11.2.7.1 Railway Network

Kaliganj has well developed railway connectivity. There are a railway comes from Dhaka to Khulna via Kaliganj. The total railways length is 2.85 km.

11.2.7.2 Waterway Network

There are no any mentionable waterway networks at Kaliganj Paurashava. Local trip are made by boat for local people in the Chitra River during rainy season

11.2.7.3 Air Communication

If the residents of Kaliganj want to avail the airways facility they have to go to Jessore City.

11.3 Future Projections

This section presents future projection on transportation requirement of Kaliganj Paurashava up to the year 2031. The chapter also provides information on transport network and future traffic volume and level of service.

11.3.1 Travel Demand Forecasting for Next 20 Years

Road is one of the most critical areas of the current planning project under UTIDP. The main problem of present road network in the Paurashavas is that there is no systematic planning of the roads, whether highway or local roads. There is no logical links of roads and no plan to link the important activity areas where mobility is high. The present level of transport infrastructure at the Upazila Town in Bangladesh is satisfactory. Reviewing different previous planning proposals in Bangladesh and other similar countries and after discussions with experts and LGED officials of this project a set of standard for basic infrastructure and services at Upazila level towns has been finalized. Accordingly different standards have been suggested for different types of Paurashava roads at Kaliganj, which are as follows:

Table 11.2: Geometric Design Standards of Roads Proposed by LGED

Road Type	Right of Way (ROW)
a) Primary Road	150-60 feet
b) Secondary Road	40 feet
c) Tertiary Road	30 feet
c) Local/Access Road	20 feet

Source: UTIDP, LGED.

Kaliganj is a small town with a very low volume of internal and external traffic movements. So consultants have established a road hierarchy based on the functional area within the Paurashava and as well as the external and internal linkage. This hierarchy will be established as per the geometric design standard provided by the PMO office of LGED and suggestion of the consultation with the Paurashava.

To extrapolate the transport demand, it is necessary to accumulate data on employment, vehicle ownership, trip distribution, etc. Though some categories of data mentioned above have been collected through Socio-economic Survey, yet these data are highly inadequate to forecast future travel demand.

Furthermore, the traffic survey conducted as per ToR was intended to give an overall picture of traffic movement pattern in the project area. The collected data are not detailed enough to allow extrapolation of traffic data. So, it is not possible to develop any traffic model and to forecast future traffic demand.

The complexities of traffic in the study area, as per observation are assumed to be insignificant. It is considered that at this level of traffic in the town current measures are sufficient. Detailed traffic study reviews on the transportation and traffic management plan for future.

11.3.2 Transportation Network Considered

An efficient transportation system will enable the project area to develop as an important urban centre through proper functioning of its activities. This is considered in the preparation of transportation network plan of Kaliganj Paurashava.

11.4 Transportation Development Plan

The current section of this chapter of the report is about Transport Development Plan covering its development plan proposals and management of the proposed project area up

to the year 2031. The report describes existing transportation facilities and consultant's proposal on the important facilities such as, bus terminal, truck terminal, rickshaw/van stands, baby taxi/tempo stands and passenger sheds for local bus users. Many of the proposals may now seem to be premature, but will be necessary in future. If their executions are delayed, land may not be available in future for providing such facilities. Appendix-3 shows the road network plan of Kaliganj Paurashava.

11.4.1 Plans for Road Network Development

The standards are meant for use by UTIDP, LGED and other planning and development agencies. The standards have been adopted by the consultants to draw up the transportation development plan. Following are the suggested planning standards (Table 11.3) for road network development. These road hierarchies are proposed based on the functional linkage of the road of Kaliganj Paurashava.

Table 11.3: Proposal for Road Standard in the Project area

Roads 7.77% of the total built up area	
Road Type	Widening
Paurashava primary roads	RoW 60, 80, 120, 150 ft
Paurashava secondary roads	RoW 40ft
Tertiary Road	RoW 30 ft
Access Road/ Local Road	RoW 20ft

Source: Upazila Towns Infrastructure Development Project and Proposed by Consulting Firm, Interim Report Kaliganj Paurashava

Neighborhood and Local Road

The right of way (RoW) of all neighborhoods (mahallah) roads may be in between 20 ft. wide depending on their functions.

Standard Road Design

All urban roads should have flexible pavements. The road intersection should be designed to allow easy movement of vehicles. At bridge, the road design should provide for an adequate sight distance and a smooth riding.

Functions of Roads

Each category of road has its particular functions to perform. Access road carries traffic from buildings to the collector road and collector road carries traffic to the major road and vice versa. In reality, however, it is almost impossible to maintain this hierarchical use of roads except in an entirely planned area. However, functions will not be dependent on the road width, rather on the location of the road, surrounding land use and the link it is providing or the volume of traffic it is carrying. Thus a 40 feet wide secondary road can become a major road due to its strategic location and the purpose it is serving.

11.4.1.1 Road Network Plan

At present four major roads coming from three different directions meet together at the Kaliganj Bus Stand Mor. Four major roads connect the town with different urban centers including district headquarters. All the important facilities like commercial, industrial administrative, Educational, community, health and recreational services and amenities are situated along side of these roads. Apart from major roads, a large number of local roads

having width varying from 10 ft. to 20ft, provide access to individual houses and establishments and connect them to major roads and give access to individual houses and establishments. Planning team initiates to develop external and internal roadway connectivity based on these major roads in a manner to avoid the external vehicles movements through the core area of the town. It is observed Bus Stand intersection has not been properly designed and also the busiest intersection due to its various uses which causes serious traffic congestion. Most dense and high rise structures are situated in this road. This requires a bypass road which connect Kustia road to Jessore road (80 ft) in west peripheral area for minimize traffic congestion. RoW of this proposed by pass will 80. Other roads road will be widening and newly constructed to establish the road hierarchy within the town.

Summary of Road Network Plan

Total 114.52 km of road development has been proposed in Kaliganj Paurashava. Total 24.49 km road will be newly constructed and 90.04 km road will be widening up to the planning period 2031. Length of the local road will be 45.94 km and RoW of these roads will be 20 ft which covers 36.25% of total road network development proposal. The length of tertiary road will be 7.29 km which covers 6.15%. Total length of secondary road will be 20.52 km and RoW of these roads will be 40ft for this ward. The rest road will be developed as primary road and its RoW will be 60 ft, 80 ft, 120 ft and 150 ft. The detailed scenario of road network development proposal is given in Table 11.4. In the following paragraph more detail scenarios of different are given.

Table 11.4: Summary of Road Network Plan of Kaliganj Paurashava

Road Width (in ft)	Length (in km)	Percentage	Road Type
15.00	11.83	9.32	Walk way
20.00	45.94	36.25	Local Road
30.00	7.29	6.15	Tertiary Road
40.00	20.52	17.14	Secondary Road
60.00	7.04	5.51	Primary Road
80.00	11.84	7.43	
120.00	5.18	4.61	
150.00	4.83	5.14	
Total	114.52	100.00	

Paurashava Primary Road

Kustia- Kaliganj-Jessore road will be developed as primary road for Kaliganj Paurashava. Total length of primary road is 22.69 km with 60 ft, 80 ft, 120 ft, 150 ft RoW. 6.52 km Primary Road is proposed with 150 ft RoW and 5.85 km Primary Road is proposed with 120 ft RoW within in Kaliganj Paurashava. Within these total 9.43 km primary road with 80 ft RoW will be widening. Figure 11.1 shows the layout design of primary road with 80ft RoW.

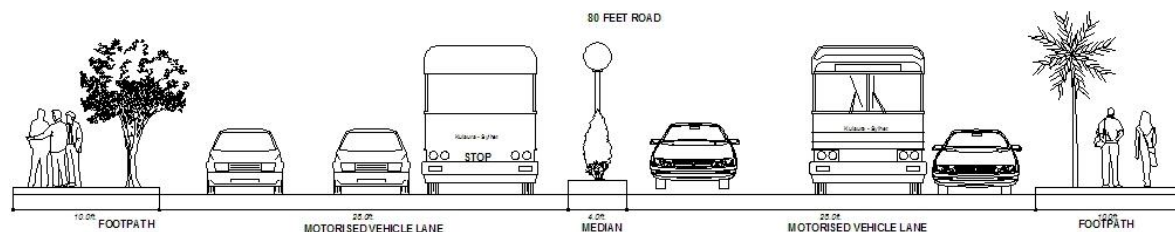


Figure 11. 1: Primary Road with 80 ft RoW

In additionally 6.99 km Primary Road is proposed with 60 ft RoW within in Kaliganj Paurashava and proposed link bypass road will be widening up to 60 ft. Figure 11.3 shows the layout design of primary road with 60ft RoW. Map 11.2 shows the proposed primary road of Kaliganj Paurashava.

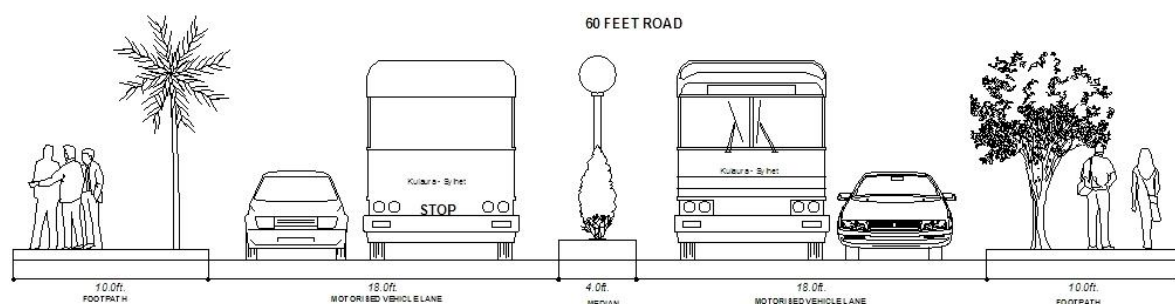


Figure 11. 2: Primary Road with 60 ft RoW.

Paurashava Secondary Road

Total secondary road is 20.52 with 40 ft RoW. Within in these 20.43 km secondary road will be widening which covers 22.28% of total road widening proposal and rest 1.32 km new secondary road will be constructed which covers 5.38% of total new road proposal for the town. Figure 11.3 shows the layout design of secondary road with 40 ft RoW.

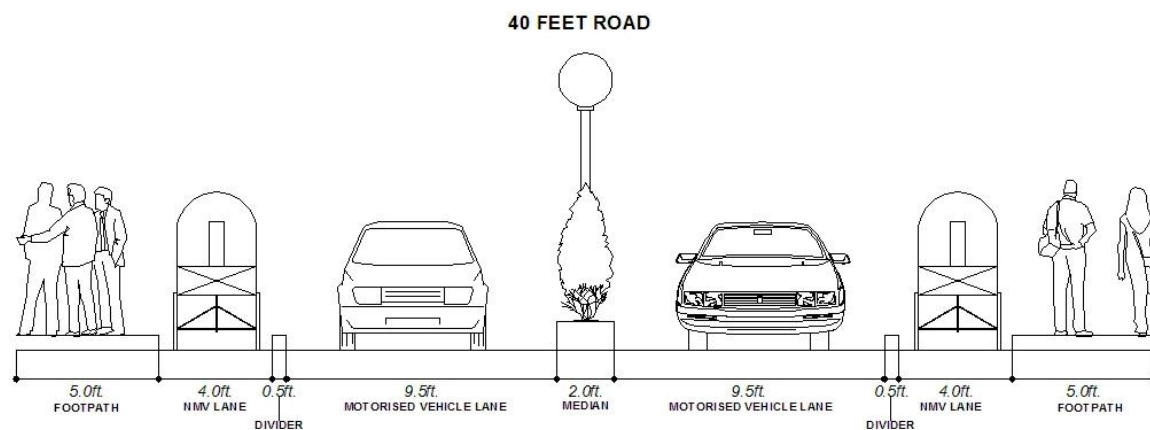


Figure 11.3: Secondary Road with 40 ft RoW.

Paurashava Tertiary Road

Total tertiary road is 7.29 km with 30 ft RoW which covers 6.15% of total road network plan for Kaliganj Paurashava. Among these total 7.53 km existing road upgraded to tertiary road which covers 8.22% of total road widening proposal. Figure 11.4 shows the layout design of tertiary road.

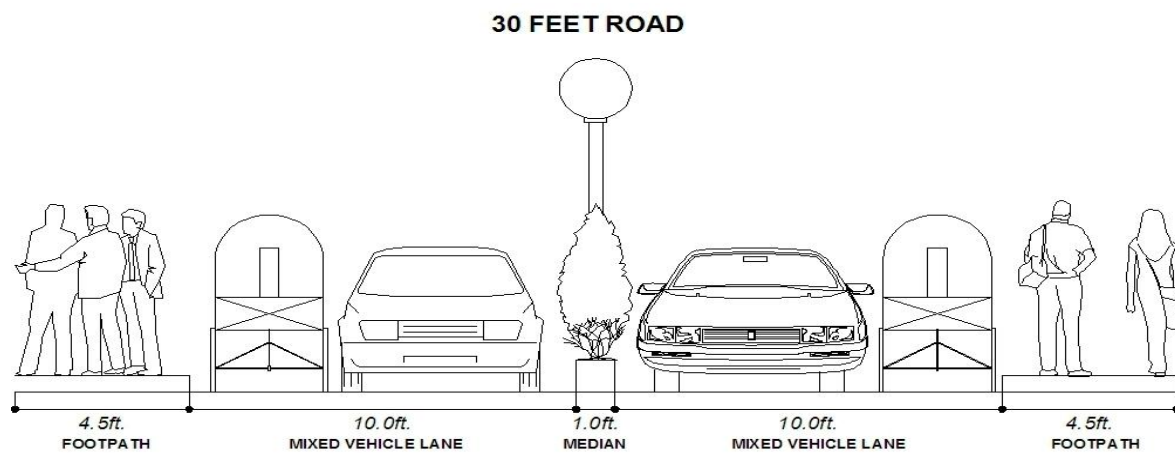


Figure 11. 4: Tertiary Road with 30 ft RoW

Map 11.2: Road Network Plan for Kaliganj Paurashava

Access Road/ Local Road

Total local road is 45.94 km with 20 ft RoW, which covers 36.25% of total road network plan of Kaliganj Paurashava. Of which total 37.68 km road will widening existing road and 8.32 km road will newly construct to fulfill the future need of the Paurashava. Figure 11.5 shows the layout design of local road with 20 ft RoW for Kaliganj Paurashava.

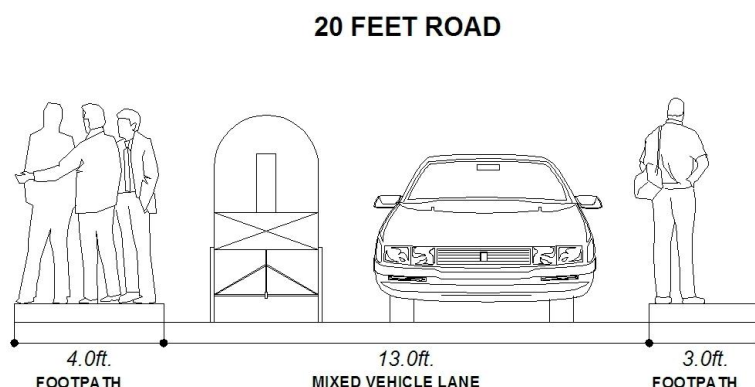


Figure 11.5: Access/Local Road with 20 ft RoW.

11.4.1.2 Proposal for Improvement of the Existing Road Networks

Most of the road in Kaliganj Paurashava is very narrow and it creates some sort of transportation problem. To improve this situation about 90.04 km road is proposed for widening in the transport development plan. Detail was given in Appendix-C and Ward Action Plan.

11.4.1.3 List of Proposed New Roads

To improve existing transportation system about 24.49 km new road is in the transport development plan. Detail was given in Appendix -C

11.4.2 Plans for Transportation Facilities

In the field of transportation facilities, the consultant has proposed such facilities as, bus terminal, truck terminal, rickshaw stands, baby taxi/tempo stands and passenger shed for local bus users.

11.4.2.1 Transportation Facilities Plan

Details requirements of different transport facilities are given in Table 10.11, Chapter 10, and Part B of this report. The standards are meant for use by UTIDP, LGED and other planning and development agencies. The standards have been adopted by the consultants to draw up the transportation development plan.

11.4.2.2 Parking and Terminal Facilities

Bus Terminal

At present there is no specific bus stand at Kaliganj Paurashava. All shorts of buses stop and departed from the Bus Stand Mor. The buses are normally parked beside road or on street, with a capacity of accommodating about 3-5 buses at a time. Another Upazila Bus stand is located beside the Upazila Complex. Future increasing travel demand and growth

of the town requires a specific place for bus stand, terminal. Considering this demand, a bus terminal is proposed beside proposed Kaliganj- Kustia road with an area of 5.65 acre in Ward 01. Detail scenario is given in Table 10.20, Chapter 10, Part B of this report.

Truck Terminal

There is also no specific truck terminal at Kaliganj Paurashava. 2.89 acre of land has proposed in Ward no 06 for truck terminal.

Tempo Stand /Taxi Stand

There is also no specific Tempo stand at Kaliganj Paurashava. Formal tempo stand named Para transit stand with 1.38 acre of land has proposed in Ward no 01, 02, 03, 06 and 09. Where baby taxi, tempo will parked and also use as tempo stand. Detail scenario is given in Table 10.20, Chapter 10, Part B of this report. Map 11.3 shows the transportation facilities in Kaliganj Paurashava.

Parking Facilities

There is hardly any locally owned car in the town and it is unlikely that there will be a good number of private cars in the near future. So, parking is not at all any requirement for the town at the moment. Therefore, no parking space for private car has been suggested in the plan. There is hardly any locally owned car in the town and it is unlikely that there will be a good number of private cars in the near future. So, parking is not at all any requirement for the town at the moment. Therefore, no parking space for private car has been suggested in the plan.

Table 11.5: New Development Proposal for Transportation Facilities

Ward No.	Type of Facilities	DP ID	Area (Acres)	Mouza Name	JL No.	Sheet No.	Plot No.	Phase-wise development	
								First Phase (1 st to 5 th yr)	Second Phase (6 th to 10 th yr)
1	Bus terminal	BT-01	5.65	Kaliganj	17	2	404, 414-422, 561, 562, 565, 566, 569-581, 584	Land acquisition and establishment	Maintaining and improve facilities
1	Tempo Stand	TS-01	0.36	Kaliganj	17	2	341	Land acquisition and establishment	Maintaining and improve facilities
2	Tempo Stand	TS-02	0.53	Kaliganj	17	2	929, 930	Land acquisition and establishment	Maintaining and improve facilities
		TS-03		Paikpara	14	0	146, 147	Land acquisition and establishment	Maintaining and improve facilities
3	Tempo Stand	TS-04	0.19	Foila	29	0	516	Land acquisition and establishment	Maintaining and improve facilities

Ward No.	Type of Facilities	DP ID	Area (Acres)	Mouza Name	JL No.	Sheet No.	Plot No.	Phase-wise development	
								First Phase (1 st to 5 th yr)	Second Phase (6 th to 10 th yr)
6	Tempo Stand	TS-05	0.07	Nischinapur	36	2	521, 1238	Land acquisition and establishment	Maintaining and improve facilities
6	Truck Terminal	TT-01	2.89	Nischinapur	36	2	1191, 1193, 1198, 1199, 1201-1204	Land acquisition and establishment	Maintaining and improve facilities
9	Tempo Stand	TS-06	0.23	Shibnagar	27	0	508	Land acquisition and establishment	Maintaining and improve facilities
Total			9.92 Acres						

11.4.2.3 Development of Facilities for Pedestrians, Bicycles and Rickshaws

Footpath

Footpath has been recommended for all the roads (above 20 ft) for safety and ease of pedestrian movement. Due to narrow right of way, it is difficult to provide wider footpaths. Width of footpaths will vary between 1.5 m to 2.0 m depending on availability of right of way. Provision of foot path facilities has been given Figure 11.2 to Figure 11.6 of this chapter. Here the panel team initiates to ensure footpath facilities along all the proposed roads in road network development plan.

Map 11.3: Proposed Transportation Facilities of Kaliganj Paurashava

Bicycles and Rickshaws

Separate lane for NMT vehicles will be provided in Transport network development plan which will be used by bicycle and rickshaw. Figure 11.4 shows the provision of separate lane for NMT vehicles.

11.4.2.4 Other Transportation Facilities

Improvement Roadway Intersection

Due to the poor designing of road way intersection, traffic congestion and traffic conflict occur in the Paurashava. To avoid this, appropriate design will be provided for the major intersections within the Paurashava in the detailed area plan.

Signals and Road Marking

Road markings must be put on major roads and signals must be installed at intersections for good traffic management. Traffic police have to be posted at critical intersections.

Traffic Island

There is one traffic island at Kaliganj Bazar, Bus Stand intersection, Nimtola intersection. To ensure smooth traffic flow, avoiding traffic conflict and ensuring good traffic management islands are proposed in the transport development plan in all the major intersections.

11.4.3 Waterway Development/Improvement Options

Chitra River flows from the middle of the Paurashava. But the water way network is not developed due lack of navigability of river bed.

11.4.4 Railway Development Options

Kaliganj Raiway station is located at ward no 05. Through this railway network Kaliganj is connected with Dhaka, Khulna, Rajshahi and with other important towns of country. So initiative will be taken to improve the existing facilities and ensure effective use of this railway network.

11.5 Transportation System Management Strategy (TSM)

This section describes transportation system management (TSM) in respect of facilities and operations, traffic flow and safety, and traffic management in Kaliganj Paurashava.

11.5.1 Strategies for Facility Operations

Since road is limited and it is foreseeable that new road construction will be very difficult due to unavailability of land and funding, traffic management strategies are required in order to ensure appropriate mobility. The following strategies are recommended for an overall traffic management improvement program:

Traffic Engineering

Ensure effective use and management of existing physical infrastructure. These enhancements typically include better road markings, signs, traffic signals, channelization at intersections, turning restrictions and separation barriers, space for bus stops, and

parking/waiting areas for public transport vehicles (buses, rickshaws, auto-rickshaws, taxis, etc.). Each of the intersection approaches is required to have proper pedestrian crossing stripping i.e. Zebra crossing.

Parking

Parking should be prohibited on arterial highways unless it is possible to designate spaces such that they do not interfere with the free flow of traffic. At bus stops, there will be a need to provide properly design spaces for the use of feeder services provided by either rickshaws or auto rickshaws.

Roadside Interference

Measures that move in a positive and definitive manner to reclaim the full potential capacity of the existing road by relocating or removing inappropriate and illegal non-transport related activities from the public right-of-way. In some cases this may involve the need to help relocate or establish alternative sites for such activities.

The right-of-way should be clearly defined and all obstructions removed within these confines. This will entail a gradual clearance of illegal trading areas, surplus building materials left over from construction and items such as refuse containers deposited on the road itself.

11.5.2 Strategies for Traffic Flow and Safety

Improved safety requires a multi-dimensional comprehensive approach involving issues related to road conditions, regulations, enforcement, driver training, vehicles, public education, awareness, incident response and information, all of which should be applied in a systematic manner over time and with adequate funding.

Road Safety Initiatives

Effective road safety action requires the involvement of many different disciplines and the cooperation of a wide range of government, private and civil entities.

Traffic Law Enforcement

Traffic law enforcement is needed to encourage safer road use and orderly traffic flow. Enforcement of various regulations, such as speed limits, use of seat belts, wearing of motorcycle safety helmets etc. have led to reductions of associated deaths and injuries in many countries. Effective enforcement of traffic regulations require training of the traffic police force in many traffic related areas, including incident investigation, highway patrolling, motorcycle riding and car driving and management skills. Traffic rules and regulations should be strictly enforced for all. Provision of instant fine for violations may be introduced.

Driver Training and Testing

The behavior of drivers, particularly of commercial vehicles, is generally considered to be chaotic and does not reflect consideration for others. Commercial vehicles are involved in a majority of incidents. Effective driver training and testing is important for achieving a long-term reduction in the statistics. To ensure that road user behavior becomes safer, improvements in the training and testing of all drivers is required. A “motivational” training program for all drivers, organized with the involvement and support of the vehicle owners

and professional associations is one example of the type of training that would be beneficial.

Education and Publicity

To develop safe road user behavior, children need to be taught skills (i.e. how to cross a street safely, how to use traffic signals properly, how to watch for and anticipate driver behavior, etc.) rather than focusing simply on rules, regulations and knowledge of traffic signs. To be effective, road safety education requires a clear structure within a recognized curriculum with a planned, sustained and coherent program of learning, based on sound educational principles. Children learn a lot from observation of others.

Road safety publicity for the general public is equally important. Road safety education is a long-term intervention, aimed at developing positive attitudes in children such that they become safer road users in the future. Publicity is an indispensable part of any nation's road safety strategy. Boys scouts and local NGOs can be engaged for this purpose.

Vehicle Safety

Substandard, often overloaded, vehicles using roads that facilitate increasingly higher speeds, invariably will lead to increased incidents. Poor vehicle condition is widely accepted in Bangladesh to contribute to the number and severity of road collisions.

Despite inspection forms and manuals having been produced under a recent aid project, little priority has gone into their use. While inspection monitoring procedures are thorough, no use is made of the data nor concern shown over the unrealistically high pass rate. Vehicle inspection is treated perfunctorily and the minimal inspection procedures reflect this attitude. This sector has made little significant progress and is unlikely to do so without substantial support. Motivational training of the official's concerned and strict enforcement of inspection procedures is needed. Five computerized vehicle inspection stations have been built and equipped with the assistance of loan from the ADB and these are waiting commissioning.

Medical Services

Lack of first aid and prompt transportation to adequate medical support facilities contribute to what medical professionals call the 'second accident', where injury severity is worsened for lack of proper care and quick transport services. Payment in advance is often required before a driver will transport an injured person. While major hospitals have ambulances, they are primarily used for non-emergency situations and rarely if ever respond to a road incident scene. In addition, hospital facilities and rehabilitation services are inadequately equipped to provide needed medical attention.

Initial, on the spot first aid care can contribute greatly to reducing morbidity and injury severity by ensuring the victim is kept breathing, bleeding reduced and shock controlled. Improvements in at-the-scene first aid care.

Information and Data

In order to improve road safety, it is important to determine the causes of road based collisions. At present, the focus of data is on number of incidents and on their severity, in terms of fatalities, injury and casualties. There is a need to establish a mechanism to analyze the cause of every incident.

11.5.3 Strategies for Traffic Management

Traffic Management is the maximum use of existing road space, using traffic operations enforcement, materials and equipment to achieve safe and efficient movement of people and goods. An example of the absence of good traffic management is the chaotic disorder that exists in many areas of the Paurashava today. A major source of traffic problem is poor traffic management. Traffic police have to be posted at critical intersections.

11.6 Plan Implementation Strategies

The section describes the plan implementation strategies of transportation plan of Kaliganj Paurashava. This also describes the regulation to implement transport plan, evaluation and coordination to implement the transport plan in the Paurashava.

11.6.1 Implementation, Monitoring, Evaluation and Coordination of the Plan

Monitoring of Plan Implementation

Regular monitoring of plan implementation is very important to see its level and nature of implementation. This will be done by the proposed Urban Planning Section of the Paurashava. It will not only monitor plan implementation, but will also identify problems associated with implementation and will suggest ways and means how to overcome the obstacles.

Mobilization of Resources

Paurashava is already suffered from scarcity of resources. For implementing the development project under the plan, huge resources will be necessary. Presently, lion's share of the resources is provided by the government. But it will not be possible for the government to supply all the funds needed to implement plans of all the projects of the Paurashava. So, effort must be directed to mobilize own resources by the Paurashava. Holding tax is the most important sources of local revenue, there should be attempt to maximize holding tax collection. The Paurashava should collect hundred percent of its holding tax. Besides, to increase earning from holding tax, updating of holding information should be carries out regularly. In this revision, new structure should be brought under tax.

Institutional Arrangement

Effective enforcement of traffic regulations require training of the traffic police force in many traffic related areas, including incident investigation, highway patrolling, motorcycle riding and car driving and management skills. Motivational training of the official's concerned and strict enforcement of inspection procedures is needed.

CHAPTER 12

DRAINAGE AND ENVIRONMENTAL MANAGEMENT PLAN

12.1 Drainage Management Plan

This chapter states about goals and objectives, and methodology of Drainage Development Plan. An inventory of the existing drainage system of has been made as a part of the comprehensive topographical survey to be taken-up under this project. While assessing the drainage conditions, the serviceability, structural conditions, obstruction, siltation, blockages are taken into consideration. And finally describe the drainage and environmental management plan, and its implementation strategies.

12.1.1 Goals and Objectives

Provision of drainage facilities are important concern to human settlements to create better living environment. Failure to provide the adequate drainage facilities results in flooding and detrimental environmental quality.

The objectives of drainage planning are described as follows:

- To analyze drainage aspects in the planning of the Paurashava.
- To study geological fault and lineament of the project area and its surroundings.
- To study the existing water development, flood protection and flood control project (if any) in the area and their impacts in the Paurashava plan.
- To present planning options for drainage of the future Paurashava area.
- To study conservation of the natural resources like parks, open space, water bodies, existing ponds etc.
- To conserve place of historical, architectural (if any) and agricultural importance including natural fisheries.

12.1.2 Methodology and Approach to Planning

Drainage Network Survey for Paurashava has been carried out through the guideline of ToR .In this survey explore the existing drainage network system at Paurashava. The main vision of this survey is explored the length, depth, flow direction, coverage area and satisfactory level of the Paurashava inhabitants. The information of drainage network gathered from topographic, socio-economic and physical feature survey (detail was given in Chapter 6, Section 6.2 of Survey Report). Major feature of drainage and environment survey are as follow:

- Survey the main drainage channels from their heads to the outfalls and to estimate their capacity to discharge water.
- Collect and analyze meteorological data over time in the area to determine the meteorological conditions and predict storm surges.

- Determine the efficiency of the present drainage systems and make recommendation to government.
- Organize a public enlightenment campaign to expose the adverse effects of dumping refuse in drainage channels, through a mass media meeting.
- Drainage channels were surveyed by leveling from the head of the channels to the outfall using a surveyor's level. A zero datum was chosen at the head of each channel. This zero height was then used to level the channel from the head to the toe or outfall. In areas where water flow was observed, the velocity of the flow was recorded. The flow velocity was calculated by timing the flow rate within a 3-5m length of channel. In areas where sediment or refuse was observed to accumulate in the bottom of the channel, the thickness of such sediment or refuse was measured.
- A questionnaire was administered to local residents to collect information about flooding, refuse disposal and drainage channel patterns from local residents along flood prone areas. The answers to the questionnaire were statistically analyzed and use to decipher resident's opinion on the problem of flooding.

12.2 Existing Drainage System/ Network

12.2.1 Man-made drains

Almost all the drain of Paurashava is pucca. Total length of drainage network at Paurashava is 16.47 km. The highest pucca drainage network exists at Ward no. 05. Table 12.1 shows the inventory of major drain Kaliganj Paurashava.

Table 12.1: Inventory of Existing Drains

Id no.	Type of Drain	Length (in km)	Ward No.
1	Drain_Pucca	0.098	Ward No 01
2	Drain_Pucca	0.100	Ward No 03
3	Drain_Pucca	0.106	Ward No 03
4	Drain_Pucca	0.046	Ward No 03
5	Drain_Pucca	0.069	Ward No 03
6	Drain_Pucca	0.070	Ward No 03
7	Drain_Pucca	0.243	Ward No 03
8	Drain_Pucca	0.394	Ward No 03
9	Drain_Pucca	0.091	Ward No 03
10	Drain_Pucca	0.343	Ward No 03
11	Drain_Pucca	0.247	Ward No 04
12	Drain_Pucca	0.471	Ward No 04
13	Drain_Pucca	0.049	Ward No 04
14	Drain_Pucca	0.036	Ward No 05
15	Drain_Pucca	0.443	Ward No 05
16	Drain_Pucca	0.262	Ward No 05
17	Drain_Pucca	0.070	Ward No 05
18	Drain_Pucca	0.118	Ward No 05
19	Drain_Pucca	0.086	Ward No 05
20	Drain_Pucca	0.081	Ward No 05
21	Drain_Pucca	0.200	Ward No 05
22	Drain_Pucca	0.715	Ward No 05
23	Drain_Pucca	0.223	Ward No 05
24	Drain_Pucca	0.742	Ward No 05
25	Drain_Pucca	0.054	Ward No 05

Id no.	Type of Drain	Length (in km)	Ward No.
26	Drain_Pucca	1.288	Ward No 05
27	Drain_Pucca	0.029	Ward No 05
28	Drain_Pucca	0.359	Ward No 05
29	Drain_Pucca	0.038	Ward No 05
30	Drain_Pucca	0.254	Ward No 05
31	Drain_Pucca	0.697	Ward No 05
32	Drain_Pucca	0.022	Ward No 05
33	Drain_Pucca	0.088	Ward No 05
34	Drain_Pucca	0.172	Ward No 05
35	Drain_Pucca	0.065	Ward No 05
36	Drain_Pucca	0.119	Ward No 05
37	Drain_Pucca	0.131	Ward No 05
38	Drain_Pucca	0.126	Ward No 05
39	Drain_Pucca	0.012	Ward No 05
40	Drain_Pucca	0.135	Ward No 05
41	Drain_Pucca	0.457	Ward No 05
42	Drain_Pucca	0.682	Ward No 05
43	Drain_Pucca	0.007	Ward No 05
44	Drain_Pucca	0.020	Ward No 05
45	Drain_Pucca	0.505	Ward No 07
46	Drain_Pucca	0.052	Ward No 07
47	Drain_Pucca	0.172	Ward No 07
48	Drain_Pucca	0.245	Ward No 07
49	Drain_Pucca	0.091	Ward No 07
50	Drain_Pucca	0.066	Ward No 07
51	Drain_Pucca	0.634	Ward No 07
52	Drain_Pucca	0.581	Ward No 07
53	Drain_Pucca	0.348	Ward No 07
54	Drain_Pucca	0.906	Ward No 07
55	Drain_Pucca	0.308	Ward No 07
56	Drain_Pucca	0.200	Ward No 07
57	Drain_Pucca	0.728	Ward No 07
58	Drain_Pucca	0.094	Ward No 07
59	Drain_Pucca	0.092	Ward No 07
60	Drain_Pucca	0.068	Ward No 07
61	Drain_Pucca	0.055	Ward No 07
62	Drain_Pucca	0.084	Ward No 07
63	Drain_Pucca	0.308	Ward No 07
64	Drain_Pucca	0.058	Ward No 07
65	Drain_Pucca	0.031	Ward No 07
66	Drain_Pucca	0.201	Ward No 09
67	Drain_Pucca	0.354	Ward No 09
68	Drain_Pucca	0.230	Ward No 09

Source: Physical Feature Survey, 2009

12.2.2 Natural Canal and River

General Description of Natural Canals

Large number of water bodies is present in this Paurashava. Chitra River passes through middle of the Paurashava. There are also 3 khal existed in the Paura shva. Apart from the natural drainage system, quite a large numbers of ponds and ditches observed in the area.

River

As stated earlier Chitra River passes through middle of the Paurashava from north to south direction. Total length of the Chitra River passing the Paurashava is 5.54 km.

Beel/ Marsh land, Pond-Deghee, Ditch and Dyke

Apart from the natural drainage system, quite a large numbers of ponds and ditches (496) observed in the area covering an area of 106.49 acre. Every ward has ponds in this Paurashava these also play an important role to retain the storm water during monsoon and contribute to make the area partially flood free. Most of the water bodies are found in Ward no 05, 02, 08 and 03 of the study area. Table 12.2 shows ward wise distribution of pond and ditch in Paurashava. Map 12.1 shows the manmade and natural drainage network.

Table 12. 2: Water Bodies in Paurashava

Ditch	Khal	Pond	Total
186	3	310	499

Source: Physical Feature Survey, 2009

Map 12.1: Existing Drainage Network in Paurashava

12.2.3 Analysis on land level Topographic contour

The contour map prepared through land level survey shows; nearly 100% of the study area has an average RL of 9.84 m PWD. These areas are free from normal flooding. Total contour number 3897. The lowest contour height is +4.2 mPWD and the highest contour height is +14.7 mPWD are found in the study area. Average land height of the project area is +9.66 mPWD.

It was observed that western and northern portion of Paurashava especially ward no 08, 01 and ward no 09 of the Paurashava are on below average height elevation having mostly agricultural land and act as flood plain, during monsoon flood. Other areas are moderate elevation having flat topography where almost all settlements/homesteads are concentrated. From Map 12.1, It was observed that middle portion of the Paurashava consists of Ward no 05 and some part of Ward no. 03, 04, 07 of the on the above Average height Elevation having mostly Commercial, service activity and Industrial land act as high land which are free from the normal flood. Main activities of the Paurashava are concentrated at the central part of higher elevation.

Table 12.3: Contour derived from the spot elevation

Sl. No.	Spot Unit	Value
01	Total Contour Number	3897
02	Mean (Meter)	9.66
03	Maximum Contour Height (Meter)	14.7
04	Minimum Contour Height (Meter)	4.2
05	Standard Deviation	1.86

Source: Topographic Survey, 2009

12.2.4 Analysis of Peak Hour Run Off Discharge and Identification of Drainage Outfalls

Drain as the structure is generally develops to free our living area from household waste water and rain water of storm water. The daily waste water discharge from a household is negligible so for the drainage design it is necessary to calculate the storm water.

Urban storm drainage primarily concerns this surface run-off. The primary objective of urban drainage system design is to drain out this storm water either through open surface drains or through underground sewers. An important parameter for the design of storm water systems is the rate and volume of run-off to be conveyed through the system as a consequence of storms. Run-off estimates are carried out based on knowledge of the occurrences of heavy rainstorms and a relation between rainfall and the corresponding run-off. The quantity of run-off again depends on the geometry and physical properties of the catchments.

Rainfall occurs at irregular intervals, and intensities, and frequency and duration vary within catchments. Due to this random nature of occurrence of rain events, the storm drainage system is designed considering estimated run-off based on the analyses of past rainfall records. A widely used statistical description of heavy rainfall is that of intensity–duration–frequency curves that are developed by processing the data for a large number of storm events observed over a number of years, considering the time variation of the rainfall intensity.

Map 12.2: Topographic Map of Paurashava

12.2.4.1 Method Used

Drain as the structure is generally develops to free our living area from household waste water and rain water of storm water. The daily waste water discharge from a household is negligible so for the drainage design it is necessary to calculate the storm water.

Urban storm drainage primarily concerns this surface run-off. The primary objective of urban drainage system design is to drain out this storm water either through open surface drains or through underground sewers. An important parameter for the design of storm water systems is the rate and volume of run-off to be conveyed through the system as a consequence of storms. Run-off estimates are carried out based on knowledge of the occurrences of heavy rainstorms and a relation between rainfall and the corresponding run-off. The quantity of run-off again depends on the geometry and physical properties of the catchments.

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Calculation of Drainage Runoff:

The consultant has used the Rational Method for calculation of drainage runoff. It is relatively simple, internationally used technique for designing storm drainage system in urban areas, and according has been selected for use in estimating the design discharge for the proposed storm drains/ khals for Kaliganj Paurashava. Accordingly, the peak flows at any given point in a drainage system can be calculated by using the following formula:

$$Q = CIA/360$$

Where,

Q = peak flow in m³ / sec

C = run-off coefficient

I = design rainfall intensity in mm/hr

A = Catchment area in hectares

Run – off coefficient

The run-off coefficient C is defined as the ratio of the rate of run–off to the rate of rainfall during the same time period and is dimensionless. Because, some rainfall is retained in depression or ponds and the run–off is prevented from reaching the drain due to obstructions, or infiltrates into the soil, the run – off coefficient is less than one. Table 12.4 shows the run-off coefficients, which are commonly used when using the rational method for the individual situations.

The value applied is based upon an average for the situation under consideration, and is recommended to be set in the range of 0.40 to 0.48 for fully developed urban areas

containing a normal mix of residential and commercial properties. This table shows the common run – off coefficient used for different type of areas.

Rainfall Intensity:

The design rainfall intensity in mm/hr is defined as the average rate of precipitation of a given time period during a storm event. This is a variable value, and is dependent on the particular rainfall characteristics of the area, on the return period selected for the rainfall events, and on the time required for the run – off to flow from the most remote part of the catchment area to the point under consideration (defined as the time of concentration, T_c in minutes).

Table 12.4: Common Run – off coefficients for Different Types of Area

Type of Drainage Area		Run–off Coefficient: C
Business	Downtown areas	0.70 – 0.95
	Neighborhood area	0.50 – 0.70
Residential	Single – family areas	0.30 – 0.50
	Multi – units, detached	0.40 – 0.60
	Multi – units, attached	0.60 – 0.75
	Suburban	0.25 – 0.40
	Apartment dwelling areas	0.50 – 0.70
	Light areas	0.50 – 0.80
Industrial	Heavy areas	0.60 – 0.90
	Parks, cemeteries, playgrounds	0.10 – 0.35
	Rail road yard areas	0.20 – 0.40
	Unimproved areas	0.10 – 0.30
	Streets; Driveways and roofs	0.10 – 0.95
	Sandy soil, flat, 2%	0.05 – 0.10
Lawns	Sandy soil, avg, 2 – 7%	0.10 – 0.15
	Sandy soil, steep, 7%	0.15 – 0.20
	Heavy soil, flat, 2%	0.13 – 0.17
	Heavy soil, avg, 2 – 7%	0.18 – 0.22
	Heavy soil, steep, 7%	0.25 – 0.35

Source: Handbook of Hydrology, by - David R. Maidment

12.2.4.2 Demand Analysis

As stated earlier that the drainage network of Paurashava is mostly developed based on natural drainage system. Unfortunately most of the khals are either filled with silt and solid waste or encroached by the influential. These channels should be dredged and should reacquire from encroachment. Again, special attention would be provided to ensure integrated natural and man-made drainage network system. In the demand analysis land use, especially road network and alignment of khal will be important basis for drainage network and area determination of drains.

The existing drainage network has not fulfilled the present need of the project area. Drain as one of the basic civic demand of the Paurashava people so the 100% coverage is bare need of the built up area. It will fulfill the primary demand of the Paurashava residence and also save the loss of public and private property.

12.3 Plans for Drainage Management and Flood Control

12.3.1 Plan for Drain Network Development

Drainage Network Plan

The Paurashava needs a hierarchical drainage system for easy and smooth discharge of storm and waste water comprising tertiary, secondary and primary drains. The existing natural khals will serve as primary drains. Here only alignments of proposed drains have been shown.

Primary Drain

Primary drains are called as the main drains. Primary drains cover larger storm drainage area than above discussed tertiary and secondary drains. In ascending order its position is third. Its cross-section is larger than other types, carrying capacity is high and is constructed of brick, cement concrete and sometimes reinforced concrete. Primary drains may be of earthen structure provided sufficient land is available and land value is low. Contributing drainage water comes from tertiary and secondary drains. Primary drains discharge its drainage water to outfall, natural khal, river or large lowland area/ Beels. Figure /figures below show the typical cross-section of the primary drains:

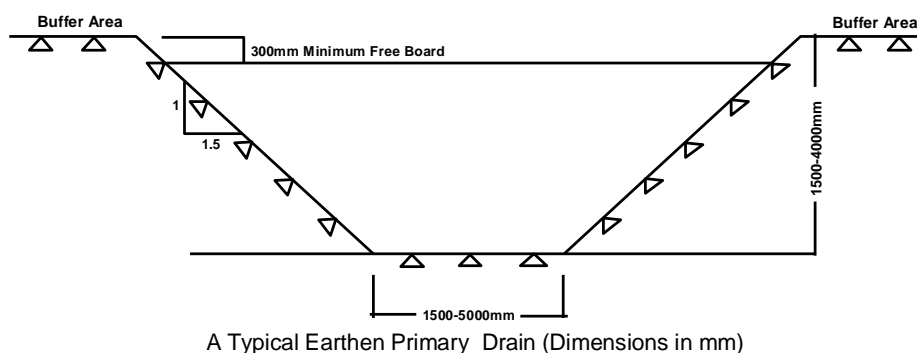


Figure 12. 1: Earthen Primary Drain

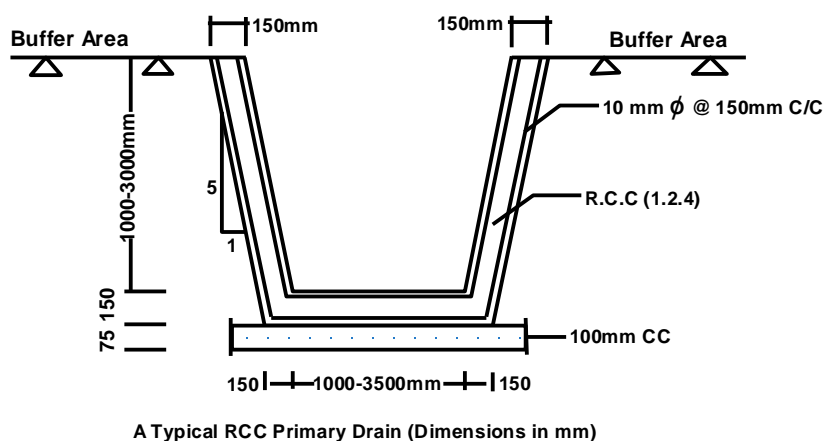
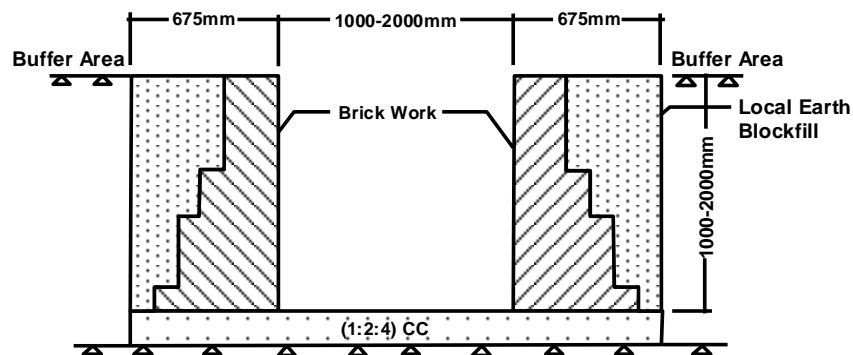


Figure 12.2: Typical RCC Primary Drain

Secondary Drain

Secondary drains collect discharge from tertiary drains. One secondary drain may receive drainage discharges from several tertiary drains in its course. Size and capacity of secondary drain is much bigger than tertiary drains, its catchment area is also bigger than tertiary drains. Like tertiary drains, it may run parallel to bigger roads. Secondary drains may run along and through the middle of its storm water contributing area. The typical cross-section, size and shape, and its construction material are shown below:

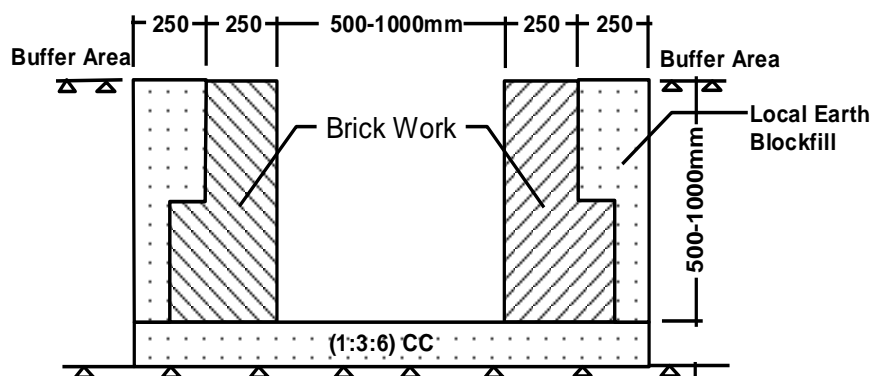


A Typical Secondary Drain (Dimensions in mm)

Figure 12.3: A Typical Secondary Drain

Tertiary Drain

Tertiary drain carry run-off or storm water received from the above mentioned plot drains and block or Mahallah drains. Their catchment area or storm water contributing area is bigger than Mahallah drains. Tertiary drains generally are the under jurisdiction of municipality and city corporation. These drains or drainage networks are constructed and maintained directly by municipalities and City Corporation. These drains are constructed by brick, cement concrete and sometimes by excavating earth in their alignments. These drains may run parallel to road or across the catchment area. Sometimes borrow pits of the road serves as drains provided borrow pits are uniformly and continuously excavated. Borrow pits that serve as drains may be channeled or lined by brick works. Tertiary drains deliver its discharge usually to secondary drains. A typical tertiary drain is shown below:



A Typical Tertiary Drain (Dimensions in mm)

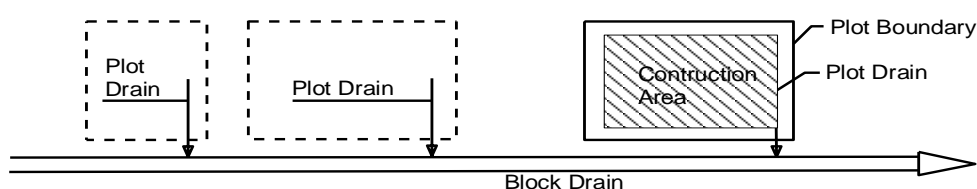
Figure 12.4: A Typical Tertiary Drain

Other kinds of drainage infrastructure are lowland, outfall areas, khals and rivers. Man

made drains are Plot, Block, Tertiary, Secondary and Primary drains and others are natural drainage infrastructures. In planning for drainage network, care should be given for road network in terms of conflict of drainage and waterways with roads. In the following and subsequent sections major element, their principle, purpose and function are discussed and presented in lower to higher order:

Plot Drains

Plot drains are provided around a building on a plot. In most cases, the drain is made of bricks and rectangular in shape that can carry storm water generated in the plot and from the building. Plot drain is connected to the Block or Mahallah drain. The sketch below gives an impression of plot drain usually constructed in a plot and block drains that follow plot drain.



A Sketch Showing Plot and Block Drain

Figure 12.5: Plot and Block Drain

Block Drain

A block drain is provided at the outside of a block that accommodates several buildings of the block. The block drains are made of bricks like plots drains but bigger in size so that it can serve the storm water generated within the block and the buildings and open areas within the block. Sometimes the block drain may serve few neighbouring blocks or Mahallahs. Block drains carry storm water coming from the plot drains. The shape of the block drain is also rectangular, but bigger than plot drains and its bottom is lower than plot drain. The sketch of the plot drain above also shows the block or Mahallah drain under plot drain.

Other Drainage Related Infrastructures

In order to facilitate or mitigate drainage issues some infrastructures are provided or used, these are namely

- i. Bridges, culverts, box culverts
- ii. Drainage sluices, pipe sluices, siphons
- iii. Sluice gates, Regulators, Navigation lock
- iv. Flood protection and drainage structures.

i) Bridges, Culverts and Box Culverts

These structures are provided at places wherever roads cross the drainage network system. Such structures are built on the roads to free passage of drainage water and sometimes to provide navigation/ boat passages. Consequently the conflict between drainage and road networks is mitigated. Figures below show bridge and culverts in such system.

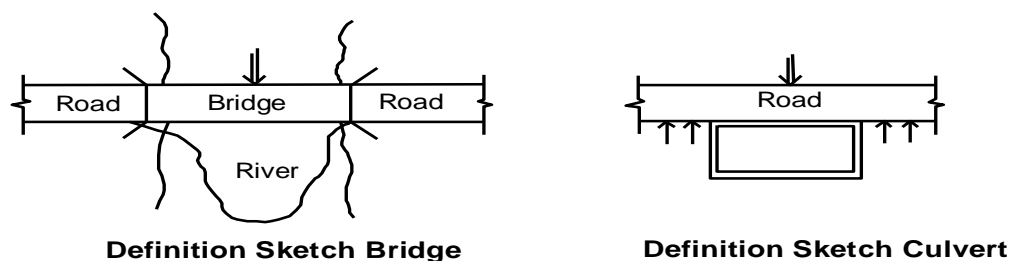


Figure 12.6: Bridge and Culvert

ii) Drainage sluices, pipe sluices and siphons

Drainage sluices, pipe sluices and siphons are provided on the embankments. Embankments protect the area from floods coming from outside rivers and make the project area flood free.

However storm water from rainfall-runoff within the area causes localized flood, drainage congestion and submergence. A sketch below shows a few of such structures.

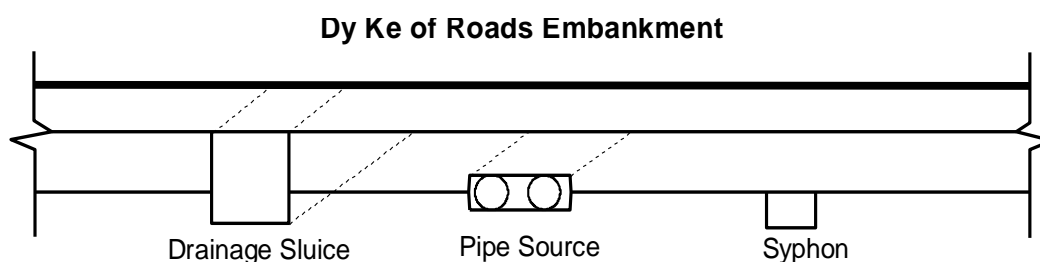


Figure 12.7: A schematic view of Drainage sluice, pipe sluice and siphon on embankment which relieve drainage congestion.

12.3.2 Outfall of Drains

There is no existing formal outfall of drains in or outside Paurashava. The secondary drains mainly discharge storm water to the nearby River Chitra, khals and borrow pits, which will be act as primary drain. Total 16 number of drainage out falls are established for drainage development plan of Paurashava.

12.3.3 Proposal for Improvement of the Existing Drain Networks

Paurashava has only 16.47 km drainage network Kaliganj Paurashava. All of are pucca drain. This drainage network served mainly in core area of the Paurashava (ward no 5, 3, 7). Based on the results of drainage study it is recommended for the existing drain that:

- Rehabilitate broken drains;
- Cover the open drains based on budget allocation.
- Construction of new channels and rehabilitation of old ones with enough drainage head.
- Construct a new pump drainage network for the area towards Dhalai River.
- Remove all un-authorized structures, which developed on drainage structures.
- Regular cleaning and maintenance by the concerned authorities.

- Embarking on a sustained public enlightenment to discourage residents from dumping their refuse into drainage channels.

12.3.3.1 List of proposed new drains

Total 66.64 km secondary drain and 87.84 km tertiary drain proposed in drainage development plan. Table 12.5 shows the summary of proposed drainage facilities at Paurashava. And Map 12.3 shows the drainage network proposal for Paurashava. In addition the Chitra River will serve as the primary drain and main out fall along with main natural drainage network. Detail was given in Appendix-D

Table 12.5: Summary of proposed drain

Type of Drain	Length in M	Length in Km	%
Primary Drain	5540.00	5.54	3.46
Secondary Drain	66641.94	66.64	41.65
Tertiary Drain	87841.45	87.84	54.89
Total	160023.39	160.02	100.00

Table 12.6: List of proposed drains

Proposed Drain ID	Proposed Drain Type	Proposed Width (M)	Proposed Status	Phase	Length (M)	Ward No.
SD-02	Secondary	1.50	New Construction	Second Phase	9213.54	Ward No. 01
SD-03	Secondary	1.50	New Construction	Third Phase	1697.05	Ward No. 01
SD-04	Secondary	1.50	Widening	Second Phase	999.96	Ward No. 01
SD-05	Secondary	1.50	New Construction	Second Phase	3208.52	Ward No. 02
SD-06	Secondary	1.50	New Construction	Third Phase	6125.14	Ward No. 02
SD-07	Secondary	1.50	Widening	Second Phase	805.63	Ward No. 02
SD-08	Secondary	1.50	Widening	Third Phase	36.05	Ward No. 02
SD-09	Secondary	1.50	New Construction	Second Phase	3041.18	Ward No. 03
SD-10	Secondary	1.50	New Construction	Third Phase	4004.10	Ward No. 03
SD-11	Secondary	1.50	Widening	Second Phase	400.35	Ward No. 03
SD-12	Secondary	1.50	New Construction	Third Phase	3278.54	Ward No. 04
SD-13	Secondary	1.50	Widening	Third Phase	308.55	Ward No. 04
SD-14	Secondary	1.50	New Construction	First Phase	5392.20	Ward No. 05
SD-15	Secondary	1.50	New Construction	Second Phase	78.17	Ward No. 05
SD-16	Secondary	1.50	New Construction	Third Phase	1.13	Ward No. 05
SD-17	Secondary	1.50	Widening	First Phase	2272.02	Ward No. 05
SD-18	Secondary	1.50	Widening	Second Phase	5.09	Ward No. 05
SD-19	Secondary	1.50	New Construction	First Phase	5233.83	Ward No. 06
SD-20	Secondary	1.50	New Construction	Second Phase	1.46	Ward No. 06
SD-21	Secondary	1.50	Widening	First Phase	1368.24	Ward No. 06
SD-22	Secondary	1.50	New Construction	First Phase	7156.92	Ward No. 07
SD-23	Secondary	1.50	New Construction	Second Phase	99.78	Ward No. 07
SD-24	Secondary	1.50	Widening	First Phase	2709.32	Ward No. 07
SD-25	Secondary	1.50	Widening	Second Phase	1.01	Ward No. 07
SD-26	Secondary	1.50	New Construction	First Phase	7.23	Ward No. 08
SD-27	Secondary	1.50	New Construction	Third Phase	3462.73	Ward No. 08
SD-28	Secondary	1.50	New Construction	First Phase	5.41	Ward No. 09
SD-29	Secondary	1.50	New Construction	Second Phase	5727.79	Ward No. 09
TD-02	Tertiary	1.00	New Construction	Second Phase	6906.85	Ward No. 01
TD-03	Tertiary	1.00	New Construction	Third Phase	4554.11	Ward No. 01
TD-04	Tertiary	1.00	Widening	Second Phase	1061.01	Ward No. 01
TD-05	Tertiary	1.00	New Construction	Second Phase	3161.80	Ward No. 02
TD-06	Tertiary	1.00	New Construction	Third Phase	7567.30	Ward No. 02
TD-07	Tertiary	1.00	Widening	Second Phase	341.41	Ward No. 02
TD-08	Tertiary	1.00	New Construction	Second Phase	2250.21	Ward No. 03
TD-09	Tertiary	1.00	New Construction	Third Phase	7196.02	Ward No. 03
TD-10	Tertiary	1.00	Widening	Second Phase	706.92	Ward No. 03
TD-11	Tertiary	1.00	New Construction	Third Phase	4536.24	Ward No. 04
TD-12	Tertiary	1.00	Widening	Third Phase	393.57	Ward No. 04

Proposed Drain ID	Proposed Drain Type	Proposed Width (M)	Proposed Status	Phase	Length (M)	Ward No.
TD-13	Tertiary	1.00	New Construction	First Phase	12445.92	Ward No. 05
TD-14	Tertiary	1.00	New Construction	Second Phase	70.04	Ward No. 05
TD-15	Tertiary	1.00	New Construction	Third Phase	0.42	Ward No. 05
TD-16	Tertiary	1.00	Widening	First Phase	750.15	Ward No. 05
TD-17	Tertiary	1.00	New Construction	First Phase	7829.87	Ward No. 06
TD-18	Tertiary	1.00	New Construction	First Phase	15430.92	Ward No. 07
TD-19	Tertiary	1.00	New Construction	Second Phase	308.79	Ward No. 07
TD-20	Tertiary	1.00	Widening	First Phase	317.78	Ward No. 07
TD-21	Tertiary	1.00	New Construction	First Phase	6.33	Ward No. 08
TD-22	Tertiary	1.00	New Construction	Third Phase	6499.65	Ward No. 08
TD-23	Tertiary	1.00	New Construction	First Phase	1.85	Ward No. 09
TD-24	Tertiary	1.00	New Construction	Second Phase	4529.56	Ward No. 09
TD-25	Tertiary	1.00	Widening	Second Phase	922.17	Ward No. 09

12.3.3.2 List of Infrastructure measures for Drainage and Flood Control Network

About 2 bridges, 179 box culverts, 1 pipe culvert, 2 water treatment plants, one waste water treatment plant and 16 drainage outfalls will be established for drainage and flood control network of Kaliganj Paurashava.

Map 12.3: Drainage Network Proposal of Paurashava

12.4 Environmental Management Plan

This section describes the goals and objectives, and methodology and approach to planning of environment management plan.

12.4.1 Goals and Objectives

Urban planners today are becoming ever more involved with environmental concerns. Environmental planning coordinates development to meet objectives for clean air and water; removal of toxic and other wastes; recycling of resources; energy conservation; protection of wetlands, beaches, hillsides, farmlands, forests, and floodplains; and preservation of wildlife, natural reserves, and rivers. Historic preservation strives to keep important buildings and places as part of the permanent environment and uses them to finance the maintenance costs.

Every development work has both positive and negative impacts on environment. It is wise to consider the environmental impacts and its mitigation at planning stage. Environmental consideration at planning process can make the project sustainable for long period. The objectives of Environmental Study of Structure Plan, Master Plan and Detailed Area Plan project are,

- To study the existing ecological system and environmental problems in the project area;
- To suggest the mitigation measures for all environmental problems;
- To provide the guidelines and assist the planners, engineers and consultants involved in this project in preparing environmentally sound Plan for Town and
- To prepare an Environmental Management Plan (EMP) for future environmental management in the area.

12.4.2 Methodology and Approach to Planning

In environmental study, a multi-disciplinary approach is used for studying development project. The present environmental study is based on data collection and sharing with drainage and geology, transport engineering, socio-economic, economic and topographical survey components. A structured questionnaire prepared by LGED for environmental survey has been followed. Environmental study has been carried out through survey of biodiversity of flora and fauna, water pollution, local air pollution problem, drinking water sources, renewable energy, diseases, and major local environmental issues.

Secondary data has been collected from BWDB, UP Offices, Civil Surgeon Office, Thana Fisheries Office, District Agriculture Extension Office and Meteorological Department. Reports of national organizations were also considered as secondary sources of information.

12.4.3 Existing Environmental Condition

With the increase of housing along with population will produce impact on the environment. Rapid urbanization and numerous human activities will deteriorate the

environment, if the infrastructure is not developed as per requirement. So, before planning and designing of any development project, possible adverse environmental impact should be studied. The whole range of potential impacts of the project of various environmental components due to various project activities should be identified qualitatively and in quantities, where they are possible. After identification of significant impacts and issues arising out of them, mitigation measures or project modification/ alternatives will have to be proposed to address the environmental impact issues. An environmental management plan should also be formulated for mitigation and protection of adverse effect of the project on the environment. Environmental consideration in the planning process can make the project sustainable for a long period.

12.4.3.1 Geo-morphology

Geology, Soil, Sub soil Condition

Being located in the Jhenaidah District, the general soil type is following. The Paurashava belongs to Non-calcareous Brown Floodplain soils group whose main characteristics are: Non-calcareous brown sandy loams to clay loams occurring in the old Himalayan piedmont plain, Tista and Old Brahmaputra floodplains and locally in the old Ganges river floodplain. Soils are slightly too strongly acid in reaction.

Climate

Kaliganj has a tropical climate and except for heavy rainfalls, the climate is much like other parts of the country. The mean annual rainfall is 470.30 mm with the heaviest occurring during August-September period. Despite the rainfall, the climatic regime is similar to that of the remainder of the county. The cool and dry winter, December-February is followed by a hot and showery pre-monsoon period, March-May, and then the relatively cooler but very wet monsoon season, June-September. This is followed by a transitional humid and showery period up to the beginning of the winter. It is affected by tornados which periodically devastate the area in March-May and in September-November often cause damage to katcha buildings.

Temperature

Average maximum temperature varies between 30.1° C and 36.3° C and minimum temperature varies between 26.4° C (December) and 24.6° C (January). The hottest months are March, April, May, June and August. From December to February, Paurashava experiences cold periods when temperature varies from 12.5° C (December) to 14.1° C (February).

Humidity

The climate of Jhenaidah district is marked by medium humidity, the mean humidity which was recorded to be 79%.

Rainfall

The Kaliganj Paurashava has an average normal rainfall of 470.3 mm in the month of July which is highest among all other months. In August, it falls to 228.8 mm; again rising to 345.9 mm in September. From November to March, this rainfall varies between 40.1 mm to 2.5 mm. July has been the highest precipitation in comparison to September, August

and June. It should be noted that maximum monthly rainfall depth over ten years period is recorded as 917 mm which occurred in the month of September in 2004.

Wind Directions

The general direction of the wind is the same as that in the Gangetic Delta: south-west, changing to east for the greater part of the year, with a north and north-west direction during the months of April and May. Nor-westers are caused by outbreaks of cold air from Central Asia which enters Bangladesh from the northwest. This wind occurs at the interface between the advancing cold air and warm air already present in the region. The temperature difference across the interface is large enough to generate the large scale turbulence which, in turn, generates thunderstorms along the interface.

Waste and Garbage disposal

Condition of solid waste management at Kaliganj Paurashava is very poor.

House hold Waste

There is inadequate solid waste management system in Paurashava. No formal Paurashava provided dustbins are available there. So people have to dump their household waste here and there. There is also lack of awareness among the town dwellers.

Industrial waste

There is one mentionable industry within the Paurashava which is a sugar mill. Other industrial types are only rice and saw mills. But these industries do not produce mentionable industrial wastages.

Kitchen market waste

Garbages of kitchen markets are dumped to nearby dustbins.

Clinical/ Hospital waste

Hospital waste is dumped to their own dustbin.

Waste Management System

There are only 5 dustbins. One waste collection truck and two push carts are used to collect solid waste.

Latrine

There is no public latrine at Kaliganj.

Table 12. 7: New Land Use Proposal for Drainage and Environmental Plan

Ward No.	Type of Facilities		Area in Acre	Mouza Name	JL No.	Sheet No.	Plot No.	Phase-wise development		
								First Phase (1 st to 5 th yr)	Second Phase (6 th to 10 th yr)	Beyond 10 th year)
1	ETP	ETP-01	0.33	Sreeramapur	18	0	1042-1044	Land acquisition and establishment	Maintaining and improve facilities	Maintaining and improve facilities
1	Surface water Treatment	WT P-01	2.74	Kaliganj	17	2	810-812, 815, 816, 1097			

Ward No.	Type of Facilities		Area in Acre	Mouza Name	JL No.	Sheet No.	Plot No.	Phase-wise development		
								First Phase (1 st to 5 th yr)	Second Phase (6 th to 10 th yr)	Beyond 10 th year)
1	Waste Transfer Center	WT C-01	0.04	Sreeramapur	18	0	524			
2	Waste Transfer Center	WT C-02	0.17	Khayertal	15	0	42,98, 99, 103, 104			
3	Waste Transfer Center	WT C-03	0.02	Foila	29	0	594			
4	Dumping Station	DS-01	8.56	Helai	34	0	297, 303-320, 754, 755, 782		Land acquisition and establishment	Maintaining and improve facilities
5	Surface water Treatment	WT P-02	1.21	Nischintapur	36	1	202, 206		Land acquisition and establishment	Land acquisition and establishment Maintaining and improve facilities
5	Waste Transfer Center	WT C-04	0.02	Nischintapur	36	2	344			
6	Waste Transfer Center	WT C-05	0.02	Nischintapur	36	2	541			
8	Waste Transfer Center	WT C-06	0.01	Nischintapur	36	3	1291			

12.4.3.2 Brick Field

There is some brickfield located at some distance away from the Paurashava and its chimney is as per the required specification.

12.4.3.3 Fertilizer and other chemical Use

Main reasons for land pollution at Kaliganj Paurashava are extensive use of fertilizer in agriculture.

12.4.3.4 Pollutions

Water

Surface water of ponds, canals and rivers is fresh and free from salinity. There are 310 ponds, 3 canals and 1 river at Kaliganj Paurashava which are important sources of water for the inhabitants. The sources of surface water pollution are domestic waste, unhealthy sanitation, poor drainage system and extensive use of fertilizer in the agriculture. Paurashava authority has taken initiative to reduce surface water pollution.

Air

As Paurashava is a small town with no heavy factory other than only a saw mill and vehicular traffic, it is almost free from air pollution. There are some brickfields located in the Paurashava area and their chimneys are as per the required specification.

Sound

As Paurashava is a small town with some small manufacturing factories and vehicular traffic, which responsible for air pollution. Particular areas adjacent to the main road like Bus Stand Mor and Bazar intersection have some noise pollution created by movement of few heavy vehicles. It is however, almost free from heavy traffic congestion.

Land Pollution

Main reasons for land pollution at Paurashava are extensive use of fertilizer in the agriculture, drain water discharge on the land, water logging, and domestic waste discharge on the land. Many latrines of households are connected to drains which create a severe environmental problem.

Other Pollution

The common diseases of the inhabitants in this Paurashava are usually the seasonal diseases. The development control rules in whichever form they are now available is not well practiced and implemented for cities and towns in Bangladesh. The relevant manpower is also weak and untrained. The political culture of Bangladesh does not very ardently follow and practice these for the common goal of the community in the context of both rural and urban development issues. Policy planning and advocacy planning did not match hand in hand to deliver these goods to the common people in the community to be aware of its lasting impact in context of planned development. The technocrats also played the role of bureaucrats and did not offer any viable work opportunities and solutions in the community. In consequence its impact led to frustrate the illustrated visions in the community. Ignorance and selfishness on the part of the local communities on land issues impede a great set back to development to portray the visions of their own planned community. In some cases corrupt officials did not implement the building construction rules and regulations mostly in unplanned communities. Therefore, traffic congestion, waste disposal, sanitation, water logging, immobility, infrastructure development could not be properly ensured, and all of these have led to environmental degradation and unplanned community development.

12.4.3.5 Natural Calamities and Localized Hazards

Erosion

Though the Paurashava lies beside Chitra River, no river erosion is marked in recent years.

Floods

Floods are annual phenomena with the severe occurring during the months of July and August. Flash flood occurs at Paurashava in one or more time in every two to four years interval and is caused by heavy rains.

Earth Quake

The town of Kaliganj is no different from other towns of Bangladesh, but as disasters are concerned it is low vulnerable to at least one disaster, earthquake, due to its location. It is situated in earthquake zone 3 of Bangladesh which is less vulnerable for earthquake.

Water Logging

There is water logging problem at Paurashava, duration of it is 2-3 months and it mainly occurs between June and August every year.

Fire Hazard

Fire hazard often occurred at the Paurashava. Frequency of fire hazard is 1 to 2 times in each year.

12.5 Plans for Environmental Management and Pollution Control

The urban environment of Paurashava includes both built and natural environment. Urbanization has some increased hazard on natural environment. Where the built environment overburdens the natural environment urbanization cannot be sustainable. The urbanization is vital for countries economic growth. Urban centers concentrate services, infrastructure, labor, knowledge, entrepreneurship and markets. Marketing cities are key generators of economic activities. The urban economics are critically important in national growth and the achievement of development goal. Urbanization is unavoidable. So in every phase of planning processes all these environmental issues shall be evaluated and proper measure shall be taken to minimize the adverse environmental impacts on land pollution, water and air quality, biodiversity resources and marine resources by energy usage, transport network, waste management, slum improvement, disaster etc.

12.5.1 Proposals for Environmental Issues

12.5.1.1 Solid waste management Plan

An improved sanitary and sewage system consists of a network of sewers for collection of sewage from the service areas of town and conveying those to the treatment plant. Paurashava has got limited resource and affordability to maintain such a system, as such low-cost sanitary system comprising sanitary/unsanitary latrine is being followed all over the area. To identify the most suitable types of low-cost sanitary latrines for the community; to identify the constraints in installation and use of sanitary latrines and to monitor the behavioral changes as well as the health improvement after providing some sanitary facilities with the intensive motivational work for practicing appropriate defecation systems.

Criteria for Selection of Solid Waste Dumping Site

Usually the Paurashava does not have its own solid waste disposal site. For selection of solid waste dumping site, the following criteria should be considered.

- Site should be located to minimum fuel distance
- Site should not create any nuisance to the residential areas
- Site should be connected with main road and have sufficient width for truck movement.
- Infiltration of water into the dump should be prevented by covering the wastes with a layer of soil and sloping surface of the dump.

Land Requirement for Solid Waste Management

Total waste generation rate in Paurashava of Bangladesh is 0.25 kg/cap/day. The generation of wastes increases by 46% in wet seasons from dry season (Source: Community Based Solid Waste Management through Public-Private-Community Partnerships: Experience of Waste Concern in Bangladesh by Iftekhar Enayetullah, October 30 to November 1, 2006). At present (on year 2011) Kaliganj Paurashava per day solid waste generation of 6.96 metric ton in dry season and 8.68 metric ton during wet season. As per this assumption, at Kaliganj Paurashava per day solid waste generation will be 9.718 metric ton at dry season and 12.438 metric ton during wet season by the year 2031. So the required land for solid waste filling will be 2.25 acre. After filling and closing up of solid waste disposal site, it can be used for many purpose such as playground, market, shopping center, parks, recreational area, car parking area, bus/truck terminal or other public facilities. Total 22.00 acres land is proposed by the Paurashava for solid waste dumping station south corner of the proposed Paurashava Master Plan.

12.5.1.2 Open space, wet-land and relevant features protection Plan

The river Chitra is a great asset that plays multifaceted role for the town. It could be a source of water and also a source of recreation or open space.

Mitigation:

- ❖ The river should be preserved for future sustainable source of surface water supply for the city when the city's ground water would be depleted.
- ❖ Its banks can serve as breathing space and recreation for the town dwellers.
- ❖ The river should be kept pollution free applying regulatory measures based on environmental regulations,
- ❖ No industry should be allowed within 100 m of the river bank.

Loss of Wetlands

Wetlands are mainly affected first by the urbanization process. Earth filling fills up the ponds, ditches. Waste water affects the aquatic ecosystem and makes the ponds and ditches unproductive and as a result the aquatic plants, fishes and animals have to die or migrate to other places. There is no strict regulation on earth filling of ponds. The Paurashava can fine only Tk.500 if someone fills the ponds. However, Wetlands Conversation Act exists in Bangladesh, which is applicable only to natural beels and khals. Wetlands play an important role as a reservoir of rain and flood water. They are also important to maintain the balance of ecosystems and for replenishing the ground water level through seepage.

Mitigation:

1. Designate all ponds in Master Plan Map and protect the large ones according to the ecological importance and public interest.
2. Protect the ponds as per regulatory framework of Master Plan.
3. Avoiding wetlands during road alignment fixation.

4. Stopping housing, industries and other development works in wetlands through earth filling.
5. Stopping earth filling of ponds in the area through creation of public awareness.
6. Strict implementation of Wetland Conversation Act, 2000.
7. Strict implementation of Environment Conversation Act (ECA), 1885
8. Create new laws if existing one fails to stop land filling of ponds.

12.5.1.3 Ground Water Pollution

Though ground water is not a major source of drinking water supply in the study area, yet ground water pollution by salinity and arsenic is a serious problem for future water supply. It is reported that over 70% of the tube wells are affected by arsenic which is a major threat to health for those who use ground water for drinking purpose. Arsenic is geological problem. But experts view that it arises due excessive extraction of ground water. So in future, when population rises further excessive ground water extraction will aggravate contamination situation.

Mitigation Measures:

Following mitigation measures may be adopted:

1. Expand use of surface water by protecting existing ponds and excavating new ponds.
2. Introduce and popularize rain water harvesting system.
3. Reduce dependency on ground water.

12.5.1.4 Surface Water Pollution

Various surface water sources of the town are regularly polluted by deliberate drainage of waste water in respect of pH, turbidity and coliform bacteria when compared with national standard. But present pollution level is low due to low density of population and no industrial agglomeration. The main sources of surface water pollution are, urban waste water, sanitary sewage and solid waste dumping. With the implementation of this plan the pollution level may further increase as population and activity will increase leading to increase in waste water, sanitary sewage and solid waste dumping.

Mitigation Measures:

1. Abolish katcha and hanging latrines.
2. Encourage practice of sanitary latrines.
3. Take measures against indiscriminate dumping of solid waste.
4. Improve sanitation conditions of slaughter house, fish market and katcha bazar.
5. Propaganda for public awareness.
6. In future set up sewerage treatment plant to treat waste water.

12.5.2 Natural calamities and regular hazard mitigation proposals

12.5.2.1 Protection plans addressing Natural Calamities

a. Flood Protection

The Chitra River is subject to bank erosion, but it is not continuous. The road and the agricultural land along the river have eroded to some extent. With implementation of Master Plan (MP) Project, the whole project area will be protected from flooding.

Enhancement Activities:

- Arrangement of pump drainage to Chitra during high flood when gravitational drainage fails. Pump of excess water will save the area from internal flooding.

Responsible Organizations: BWDB and Paurashava

b. Earthquake

Earthquake is among the most destructive and terrifying disaster that nature can unleash. Bangladesh sits on several seismically active faults are the focal point of tremors. As Kaliganj is located in the seismic zone 2 and so it is vulnerable to earthquake. Unplanned and unregulated urbanization and disregard to BNBC rules in building construction aggravate the situation more. With the implementation of SMP the planned urbanization will strictly follow the actual zoning plan and following of BNBC rule will minimize the earthquake damage. In DMDP Urban Area Plan Volume- II, (Part-3, Interim Planning Rules) development restriction considering the geological fault line areas states “Structures above 2 stories situated within 500 meters of a geological fault is not allowed unless built to the BNBC standards for Seismic Zone 3 (BNBC Section 6 Chapter 2.25)”.

Enhancement Activities:

- Ensure all new buildings are designed and constructed following the guideline of BNBC.
- Development of a comprehensive plan for managing post-earthquake situation.
- Train community workers who would carry out the initial search and rescue efforts.
- Launch a massive public awareness campaign.

Responsible Organizations: Paurashava, MOFDM, Civil Defense, Fire Service and DOE.

c. Protection Plan addressing regular hazards

Fire Hazard

Though fire hazard is low in the town it might increase in future with increased urbanization. Fire hazard will be severe when katcha housing will be built by low income poor people and katcha bazar of the town. To avoid fire hazard following mitigation measures are recommended.

Mitigation Measures:

1. Set up modern fire extinguishing devices.
2. Discourage people from using low quality electrical wire in building and industries.

3. Ensure periodical checking of electrical lines.
4. Advise low income dwellers about cooking safety.
5. Create awareness among people about the dangers of fire hazard.

d. Protection Plan addressing encroachment and other relevant issues

Implementation of SMP activities like roads, drainage, bridge/culvert, housing and industrial estates and bazars will radically change the natural topography and land use pattern of the area. The agricultural area will be converted into urban and semi-urban area. The present green scenic beauty will disappear; water bodies will be lost due to rapid urbanization.

Mitigation:

1. Careful planning to minimize the change of the area.
2. Avoid water bodies during construction of roads, housing and industrial estates.
3. Practice good architectural/engineering design during planning of housing estates, buildings and the intersections of main roads.
4. Enhancement of plantation and gardening to increase the scenic beauty of the town.
5. Preserve the ponds, chhoras and large water bodies.
6. Strict implementation of Environment Conservation Act(ECA), 1885
7. Propaganda for public awareness

Responsible Organizations: Paurashava, DOE and Forest Department

12.6 Plan Implementation Strategies

11.6.1 Regulations to Implement the Drainage and Flood Plan

Management of a drainage system is more difficult than its construction. It requires not only an institutional set up but also huge resources for regular maintenance. The present engineering set up of the Paurashava is highly inadequate to manage the future drainage network. It must be equipped not only with adequate manpower but also sufficient number of logistics and equipment will be necessary for sound maintenance of the drainage system. For Paurashava with its meager revenue earning it will be extremely difficult to go for regular maintenance of the drainage system without government assistance. So, the Paurashava must be provided with sufficient budget allocation to maintenance going on regularly. The next strategy will be to create awareness among the citizens not to dispose of solid waste in the drains and get them clogged. This can be done by regular publicity, engaging NGOs for motivation and the last imposing punitive measures like, fine on the waste disposer.

12.6.2 Implementation, Monitoring, Evaluation and Coordination of the Plan

For plan implementation the first requirement would be resources, which is highly lacking in the Paurashava. It is a small Paurashava with very limited holding tax realized. So, the first strategy will be to increase its revenue earning and non-revenue earning income. The strategy is to build capacity of the Paurashava to implement the plan. Permission for additional manpower has to be sought from the government. At the same time additional fund has to be provided to pay for salaries and charges.

CHAPTER 13

PLAN FOR URBAN SERVICES

This chapter describes the urban basic services development proposals for future development of the Paurashava. The proposals have been made at the town level, that is, the area under the urban area plan. The local level development proposals will be addressed in the Ward Action Plan. The development proposals deal with the basic urban services, like, water supply, drainage, sanitation, solid waste, telecommunication, electricity and gas, community facilities, education and health.

13.1 Water Supply

The Paurashava is yet to develop its own network based water supply system. The entire water supply system of the Paurashava is based on household tube well and pond. As per the census 2011, about 92.20% household depend on tube well and about 5.8% depend on privately arrange piped water supply for drinking water. However, not many of the tube wells provide arsenic free drinking water. As a result lots of hand tube wells water is mostly used for washing purpose. Water from ponds is mainly used for washing.

Developing a network based supply system will depend on availability of fresh water aquifer. Detailed geological Investigation is required to find out fresh water aquifers. But here problem lies here to use of ground water. Safiuddin (2001) observed the serious arsenic contamination of groundwater in Bangladesh has come out recently as the biggest natural calamity in the world. The people in 59 out of 64 districts comprising 126,134 sq km of Bangladesh are suffering due to the arsenic contamination in drinking water (arsenic contamination is also found in the ground water of Kaliganj Paurashava). Seventy five million people are at risk and 24 million are potentially exposed to arsenic contamination. He also mentioned the groundwater in Bangladesh has declined progressively due to the excessive extraction of water for irrigation and domestic water supply, lack of water management and inadequate recharge of the aquifer. The groundwater declined beyond 8 meters in 12% areas of Bangladesh in 1986. This extent rose to 20% areas in 1992 and 25% areas in 1994. So in case of water supply for Kaliganj Paurashava, special emphasis will be given to use surface water rather than use of ground water. The Chitra River is the most important source of water supply.

Based on the water of Chitra River two surface water treatment plants with an area of 2.51 acres will be established on the both sides of the river (in ward no. 01 and 05). Map 13.1 shows the location of surface water treatment plant proposed for Kaliganj Paurashava. And it will be the main source of water supply network in Kaliganj Paurashava. Before it is done Paurashava should take a programme to preserve and maintain all major ponds in the Paurashava. This will require taking over passion of all major waters supply ponds in the Paurashava for the greater interest of the people at large. Detailed was given in Table 10. 21, Chapter 10, Part B of this report. Figure 13.1 thematic shows cross section of road showing the water supply network along the road.

The Paurashava has large number of ponds, khals and river. The town dwellers use their water for their daily necessities. Other than drinking and cooking purpose the use of these sources of water can be considered. In a project of DANIDA and DPHE for Water Supply and Sanitation for this type Paurashava, the daily per capita consumption has been calculated as 53 liters (Source: Raipur Paurashava). So it will require much less amount of water supply for the Paurashava town than a city consumption as assumed above. According to the estimation (on the basis of medium growth rate) in 2031 this will be around 34845 on the basis of medium growth rate. So according to the above stated per capita consumption will be 5429.55 m^3 in 2031.

Map 13.1: Proposed Basic Urban Services Map of Kaliganj Paurashava

As an alternative to drinking water supply harvesting of rain water may be explored. The idea of rainwater harvesting is unknown to the local people. NGOs working in rain water harvesting training and motivation may be engaged for this purpose. Paurashava may take initiative to prepare a programme for popularizing rain water harvesting among the Paurashava people.

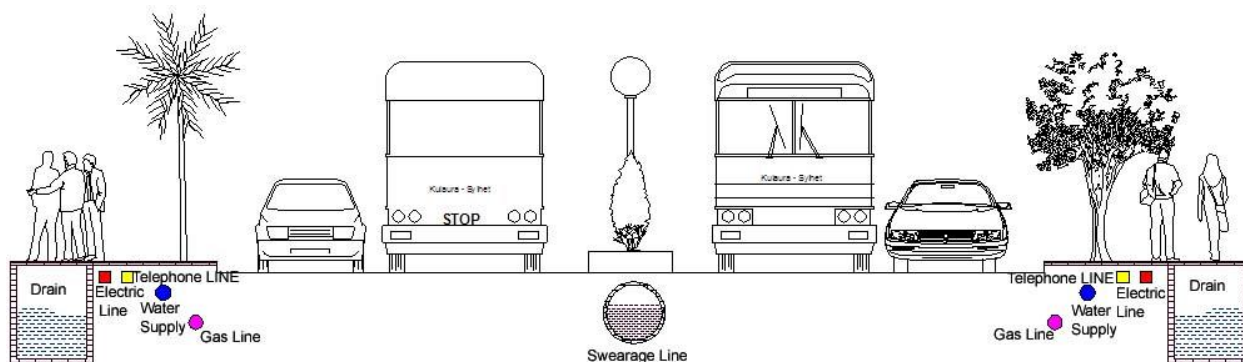


Figure 13.1: Thematic Cross Section of Road is showing different utility services along the road

13.2 Solid Waste Management

There will be 9 waste transfer stations in each ward with an area of 0.28 acres for collection of solid waste. A dumping site will be developed over an area of 8.56 acres for final disposal of the solid waste. The waste dumping site is located in Ward no. 04 at northern boundary of the Paurashava.

13.3 Sanitation

As the field survey shows, the present sanitation system of the Paurashava is composed of a variety of types, like, hanging latrine, pit latrines of different types, water sealed latrines and septic tank based sanitary latrine. Figure 13.1 shows thematic cross section of road showing the sewerage network along the road.

According to 2011 Population Census, about 49.20% of the Paurashava households had healthy sanitation and 48.90% of other toilet facilities. But the present situation, as ascertained from household survey, shows that, 99% of the households use hygienic sanitation.

Due to prohibitive expenditure one should not expect establishing network and treatment plant based sewerage system in the town by the Paurashava. So, for long the sanitary system of the Paurashava will remain on site. To promote healthy sanitation, Paurashava should promote low cost sanitary latrines in the town together with awareness building for healthy sanitation. It is proposed to set up public toilets in public gathering areas, like, existing and proposed bus stand, bazaar and the main town centre.

13.4 Electricity and Gas

Power Development Board (PDB) is mainly responsible for electricity supply in the Paurashava, supported by the Rural Electrification Board (REB). PDB works for power production and distribution, while REB is responsible for distribution only. Both, PDB and

REB have their own plans for power supply in the town, which is executed in phases, depending on demand for power. In its infrastructure plan has shown the future power supply network of the town. The required electricity facility within the Paurashava will be provided through existing power system master plan of both REB and PDB. But the greatest problem of power supply in the entire country remains to be handicapped by the shortage of supply due to low production.

Gas network has been shown along all major roads and to the designated industrial site. A recent policy of the government forbids supply of gas for domestic purpose. So gas networks have been established along major roads. Figure 13.1 shows thematic cross section of road showing the electricity and gas network along the road.

13.5 Telecommunication

The town enjoys the networks of all mobile and PSTN telecommunication companies operating in the country. Besides, there also exist landlines of BTCL, the national telephone company. Due to easy and cheaper access to mobile, the demand for land lines has decreased substantially.

13.6 Community Facilities

13.6.1 Open Space Recreation

Detailed will be given in Ward Action Plan. Table 10.18, Chapter 10, Part-B of this report shows proposed new land for new open space facilities and Table 10.19, Chapter 10, Part-B of this report shows recreational facilities for Kaliganj Paurashava. Again Map 13.1 shows the location of open space and recreational facilities proposed in Kaliganj Paurashava.

13.6.2 Market Facilities

There is scope of established local market as per the local needs in the proposed ward centers of Kaliganj Paurashava. Table 10.14, Chapter 10, Part-B of this report shows the proposed ward centers of Kaliganj Paurashava. In additionally 1 Paura market, 9 local markets, 2 neighborhood market along with the existing Paura market will be established for Kaliganj Paurashava. Besides this, a cow hat has been proposed in different part of the Paurashava. Table 10.13, Chapter 10, Part b of this report shows new proposed market facilities for this town.

13.6.3 Mosque, Eidgah and Graveyard

Standard determined for mosque that the allocated land has already been covered by existing mosque. So, additional land is not proposed for this purpose in this plan.

13.6.4 Community Center

There is a municipal community centre in the town. Beside this, the consultant proposes to set up two community centers in ward 05 and 09. Again, the consultant proposes to set up ward center in each ward. Total 5.94 acres land is proposed for ward center. Ward center

will serve for multipurpose use including Ward Counselor Office and small scale maternity clinic cum vaccination center.

13.6.5 Post Office

The existing post office will serve as the central post office for Kaliganj Paurashava and a few post boxes will set at different location so that people may enjoy easy accessibility to post documents.

13.6.6 Fire Station

There was one fire service station at Kaliganj Paurashava. So it does not require any new area.

13.6.7 Education

Total 9.34 acres of land have suggested for new education facilities. Detail new land proposal for education and research is shown in Table 10.17, Chapter 10, Part-B of this report. The facilities include three primary schools, and three secondary schools and a vocational training center.

13.6.8 Health

Estimate shows about seven acres of land for the health complex according to recommended standard. There is exists only 0.23 acre of health centre and public clinic services. In future, as the population and density increases, demand for local health facilities will increase. About 5.55 acres of land have been allotted for establishment of a hospital, maternity clinic and eye hospital. It is mentionable that presently small scale health facilities are being developed at an area of mixed zone.

Table 13.1: New Land Use Proposal for Urban Services

Ward No.	Type of Facilities	DP ID	Area in Acre	Mouza Name	JL No.	Sheet No.	Plot No.	Phase-wise development		
								First Phase (1 st to 5 th yr)	Second Phase (6 th to 10 th yr)	Beyond 10 th year)
1	ETP	ETP-01	0.33	Sreerampur	18	0	1042-1044	Land acquisition and establishment	Maintaining and improve facilities	Maintaining and improve facilities
1	Surface water Treatment	WTP-01	2.74	Kaliganj	17	2	810-812,815, 816,1097			
1	Waste Transfer Center	WTC-01	0.04	Sreerampur	18	0	524			
2	Slaughter House	SH-01	0.05	Foila	29	0	17			
2	Waste Transfer Center	WTC-02	0.17	Khayertal	15	0	42,98,99, 103, 104			
3	Waste Transfer Center	WTC-03	0.02	Foila	29	0	594			
4	Dumping Station	DS-01	8.56	Helai	34	0	297, 303-320,754, 755, 782		Land acquisition and establishment	Maintaining and improve facilities

Ward No.	Type of Facilities	DP ID	Area in Acre	Mouza Name	JL No.	Sheet No.	Plot No.	Phase-wise development		
								First Phase (1 st to 5 th yr)	Second Phase (6 th to 10 th yr)	Beyond 10 th year)
5	Surface water Treatment	WTP-02	1.21	Nischintapur	36	1	202, 206		Land acquisition and establishment	Land acquisition and establishment Maintaining and improve facilities
5	Waste Transfer Center	WTC-04	0.02	Nischintapur	36	2	344			
6	Slaughter House	SH-02	0.15	Nischintapur	36	2	588			
6	Waste Transfer Center	WTC-05	0.02	Nischintapur	36	2	541			
8	Waste Transfer Center	WTC-06	0.01	Nischintapur	36	3	1291			
9	Slaughter House	SH-03	0.06	Sreerampur	18	0	402			

CHAPTER 14

WARD ACTION PLAN

14.1 Introduction

This chapter presents Part-C of the report which contains Ward Action Plan of each individual Ward. First, the issues prevailing in different Wards have been briefly described followed by description of Development Proposals for the first phase of Ward Action Plan (1st to 5th year of planning period) for each Ward.

14.1.1 Background

The Ward Action Plans are prepared under the framework of Structure Plan and Urban Area Plan. The Ward Action Plans contain details of development proposals at Ward level including the problems and opportunities existing therein and also include the proposals made in the upper level plan that is in the Urban Area Plan. The Ward Action Plans have been formulated for execution within a period of 5 years.

Ward Action Plan is a vital part of the current plan package as far as spatial development and development control is concerned. Absence of Ward Action Plan not only hampers undertaking of development projects by planning authority, but also leads to uncontrolled and unwanted spatial development in the private sector. Land use zoning is also provided in the Ward Action Plan to enable detailed view of proposed land use and development.

14.1.2 Content and Form of Ward Action Plan

The Ward Action Plan is a detailed area plan based on the policy framework, guideline indication of Structure Plan and more detailed guidelines of Urban Area Plan. The provision of Ward Action Plan is inherent in the Structure Plan with some specific purposes. The Ward Action Plan is to:

- a. Provide basic micro level infrastructure and services in the project area through systematic planning, under the framework of Structure Plan and proposals of the Urban Area Plan;
- b. Create congenial environment to promote economic activities;
- c. Improve drainage system and protect natural water channels from encroachment; and
- d. Create service centers to promote urban growth.

14.1.3 Linkage with Structure and Urban Area Plan

Ward Action Plan is the 3rd components of the Master Plan package. The other two upper level components are Structure Plan and Urban Area Plan. Structure Plan lays down the framework of the future plan including strategies and the sectoral policies. The Urban Area Plan and the Ward Action Plan detail out development proposals under the framework of Structure Plan.

14.1.4 Derivation of the Ward Action Plan

The Ward Action Plan is derived from the conceptual framework, and guidelines and strategies for development under Structure Plan and detailed proposals of Urban Area Plan.

14.1.4.1 Revisiting Structure Plan and Urban Area Plan

To guide long term growth of the Paurashava, potential locations of major development areas are identified and the Structure Plan Area is broadly classified into seven categories, namely Core Area, Fringe Area, Peripheral Area, , New Urban Area, Agriculture, Water body, Major Circulation Network. The Urban Area Plan is prepared under the framework of Structure Plan and the infrastructure identified for improvement and development are listed as proposals in the Urban Area Plan. The broad classification of lands in the Structure Plan and detailed proposals in the Urban Area Plan form the basis for Ward Action Plan.

14.1.4.2 Prioritization

The prioritization of project proposals in Ward wise Action Plan are made on the basis of urgency for development depending on the needs of people and the town's requirement for infrastructure development.

14.2 Ward Wise Action Plan

The Ward Action Plan is prepared for each of the nine wards and is presented in order of their serial number. The Ward Action Plans are a series of detailed spatial development plans of different uses and facilities. The plans comprise maps of appropriate scale supported by explanatory report. The Ward Action Plans have been formulated for execution within a period of 5 years. They do not initially cover the entire Structure Plan area. While all sub-areas will eventually require Ward Action Plan, only priority areas are to be dealt with initially. The aim of a Ward Action Plan is to prevent haphazard urban development and ensure livable environment in areas that are likely to be urbanized soon. Initially, Detailed Area Plan should be covered for only those areas, where action is needed immediately or where development pressure is high.

14.3 Ward Action Plan for Ward No. 01

14.3.1 Demography

Ward No.1 is located on the north-east part of the Paurashava. It has the least density of population. As per the BBS 2011, this Ward had a population of 4727 persons. Population projection shows 4727 population for the year 2011. For the same year, it has a density of about 7 persons per acre (ppa) and it will be 11 ppa in 2031. Table 14.1 shows the details.

Table 14.1: Population Statistics of Ward No. 01

Item	Year	
	2011	2031
Area (acre)	696.30	696.30
Population	4727	7898
Density of Population (per acre)	7	11

14.3.2 Critical Issues and Opportunities of the Ward

Ward no.1 is mostly rural character and has scattered settlement. Here the basic facilities and infrastructures required for an urban area are not established yet.

There is absence of water supply system. Like all other Wards, water supply is also a critical problem in this Ward. Surface water is the main source of drinking and washing. When population will increase the existing ponds will be inadequate to supply adequate water for the local people that will lead to water crisis. Moreover, there is lack of arrangements for proper maintenance of the ponds. There is likelihood that without proper maintenance caretaking the ponds might get polluted by unhygienic use of water that will endanger health of the local people.

There is also no systematic drainage network in this ward. Solid waste management facility is absent here. There is also lack of recreational and educational facilities.

Very low density and scattered settlements are the main obstacles for infrastructure development, which is not adequate to run large retail business activities. This size of population will not help to grow the local economy.

Development Opportunities

i. Low Density of Population

The present density of population in the Ward is 7 ppa. From environmental point of view, this population can create a very livable environment for the area with respect to ventilation, use of road and other basic services.

ii. Good External Connectivity

Jhenaidah, the district headquarter is only 1/2 hour journey from Kaliganj. Koatchandpur and Bagherpara (Jessore) are located on the boundary of Kaliganj. It takes about 1/2 hour from Kaliganj to reach those Paurashavas.

iii. Potential for Small Scale Manufacturing

Cheap labour, availability of raw materials and agricultural land can help grow small scale manufacturing and agro based industry in this town. Furniture making as a processing industry has already established its roots in the town. Jewelry, handicrafts of different

kinds, and small engineering works can be developed here. This, however, would require local initiative. Local entrepreneurs may be provided with small capital as incentive toward initiating business ventures based on local potentiality.

14.3.3 Ward Action Plan Proposals

14.3.3.1 Review of Existing Land Use

Ward no. 01 is mainly rural in character. Out of total 696.30 acres of land in this Ward, more than 554.24 acres is used as agriculture. The residential use occupies 84.81 acres, and circulation network 5.91. There is no forest, industrial and mixed use, non-governmental services, recreational and transport and communication facilities in the Paurashava. No other notable types of land uses are found in this Ward. Map 14.1 shows the existing land use of Ward no. 01.

Table 14.2: Comparative Scenario of Existing and Proposed Land Uses of Ward No. 01

SL. No.	Existing Land use	Area in Acres	%	SL. No.	Proposed Land Use	Area in Acres	%
01	Residential	84.81	12.18	01	Urban Residential Zone	238.46	34.25
			0.00	02	Rural Settlement	5.60	0.80
02	Education & Research	14.99	2.15	03	Education & Research Zone	1.91	0.27
03	Governmental Services	5.18	0.74	04	Government Office	4.36	0.63
04	Commercial Activity	6.35	0.91	05	Commercial Zone	1.10	0.16
05	Manufacturing and Processing Activity	0.33	0.05	06	General Industrial Zone	0.00	0.00
				07	Heavy Industrial Zone	26.90	3.86
06	Mixed Use	1.24	0.18	08	Mixed Use Zone	2.62	0.38
07	Circulation Network	14.99	2.15	09	Circulation Network	68.55	9.85
08	Transport & Communication	0.00	0.00	10	Transportation Facilities	6.01	0.86
09	Community Service	0.98	0.14	11	Community Facilities	3.19	0.46
				12	Health Facilities	0.90	0.13
10	Recreational Facilities	0.00	0.00	13	Recreational Facilities	0.00	0.00
11	Agriculture	554.24	79.60	14	Agriculture Zone	267.30	38.39
12	Water Body	17.30	2.49	15	Water Body	15.91	2.28
13	Vacant Land	5.05	0.72	16	Open Space	27.23	3.91
14	Restricted	0.00	0.00	17	Restricted Area	0.00	0.00
15	Service Activity	0.76	0.11	18	Utility Services	3.11	0.45
16	Urban Green Space	2.77	0.40	19	Urban Deferred	22.97	3.30
17	Miscellaneous	0.00	0.00	20	Miscellaneous	0.18	0.03
Grand Total		696.30	100	Grand Total		696.30	100

14.3.3.2 Proposed Land Use Zoning

The category wise proposals are presented here. Table 14.2 shows the amount of land existing and proposed for different uses in Ward no.1.

Urban Residential Zone

In existing land uses, both the urban residential and rural homestead has been considered as residential use as a whole. In Ward Action Plan, more than 238.46 acres of land has been earmarked for urban residential use, which will occupy 34.25% of the total ward area.

Rural Settlement

As this Ward is rural in character, 5.60 acres of land is proposed to remain as rural settlement (0.80%) up to the year 2031.

Education and Research Zone

In Ward Action Plan, three primary schools are proposed with an area of 1.91 acres, which is 0.27% of total land of the Ward. Table 14.2 shows the comparative scenario of existing land use and proposed land use in Ward no. 01.

Commercial Zone

At present, commercial activity and density of population are medium in this Ward. Not mentionable commercial area has been proposed for this ward. Additionally, other commercial functions are provided in mixed use zone, along with administrative and community facilities for this Ward.

Circulation network

For any type of development, circulation network is an important facility. To improve the efficiency of transport network of the Ward, more roads are proposed which will consume 68.55 acres of land and more than 9.85% of the total area.

Health Services

Total 0.90 acres of land covering 0.13% of total land of Ward no. 01 will be used for health services.

Community Facilities

Land for community facilities encompasses by graveyard, temple, mosque etc. 3.19 acres of land has been proposed for community facilities in this ward.

Agricultural Zone

The Paurashava including this Ward has a vast area of agricultural land that demands formation of a separate zone like, agriculture zone. Existing agriculture land of Ward no.1 is 326.57 acres. Due to development changes of the Ward, 267.30 acres covering 38.39% of the total land will remain for agriculture up to the year 2031. Rural homestead will also perform some agricultural activities as farm, poultry or horticulture. This zone will serve as the hinterland for the town.

Open Space

Total 27.23 acres of Land is earmarked as open space for Ward no. 01. It shares 3.91% land of this Ward.

Water Body

The plan suggests for preserving most of the water bodies for two purposes, first, to serve as source of water, second to serve as water retention area during monsoon. The ponds with an area equal to or more than 0.15 acres will be preserved as the water retention ponds. The proposed retention area covers 15.91 acres of land, which covers almost 2.28% of the total Ward area.

Utility Services

Total 3.11 acres of land will be used for utility services in this Ward. It shares 0.45% of land of this Ward.

Map 14.1: Landuse Proposal for Kaliganj Paurashava (Ward No. 01)

14.3.3.3 Proposed Road Infrastructure Development

Total of 18.02 km of road development has been proposed for Ward no. 01. Length of the local road will be 5.74 km and width of these roads will be 20 ft which covers 31.84% of total road network development proposal. Total length of will be 2.98 km of secondary road with 40 ft width will be developed in this Ward in Ward Action Plan for Kaliganj Paurashava. The detailed scenario of road network development proposal is given in Table 14.3.

Table 14.3: Summary of Road Network Proposal at Ward no. 01 of Kaliganj Paurashava

Width in Ft	Type of Road	Total		New Road		Road Widening	
		Length(km)	%	Length(km)	%	Length(km)	%
15	Walkway	1.74	9.68	1.74	45.36	0.00	0.00
20	Local/Access	5.74	31.84	0.48	12.47	5.26	37.09
30	Tertiary	1.22	6.77	0.00	0.00	1.22	8.60
40	Secondary	2.98	16.53	0.57	14.70	2.41	17.03
60	Primary	0.51	2.83	0.00	0.00	0.51	3.60
80	Primary	3.22	17.85	0.00	0.00	3.22	22.69
120	Regional	1.89	10.49	1.06	27.47	0.83	5.88
150	National	0.72	4.02	0.00	0.00	0.72	5.11
Total		18.02	100.00	3.84	100.00	14.18	100.00

Table 14.4: Proposed Road in Ward 01

Proposed Road Id	Proposed Road Type	Proposed ROW (Feet)	Proposed Status	Phasing	Length (M)
LR_N-01	Local/Access	20	New Construction	3rd Phase	22.48
LR_N-02	Local/Access	20	New Construction	3rd Phase	142.38
LR_N-03	Local/Access	20	New Construction	3rd Phase	72.61
LR_N-04	Local/Access	20	New Construction	3rd Phase	97.22
LR_N-05	Local/Access	20	New Construction	3rd Phase	106.61
LR_N-06	Local/Access	20	New Construction	3rd Phase	36.47
LR_W-05	Local/Access	20	Widening	3rd Phase	71.56
LR_W-06	Local/Access	20	Widening	3rd Phase	154.67
LR_W-07	Local/Access	20	Widening	3rd Phase	69.95
LR_W-08	Local/Access	20	Widening	3rd Phase	72.77
LR_W-09	Local/Access	20	Widening	3rd Phase	274.92
LR_W-10	Local/Access	20	Widening	3rd Phase	23.08
LR_W-11	Local/Access	20	Widening	3rd Phase	341.89
LR_W-12	Local/Access	20	Widening	3rd Phase	229.69
LR_W-13	Local/Access	20	Widening	3rd Phase	150.04
LR_W-14	Local/Access	20	Widening	3rd Phase	407.58
LR_W-15	Local/Access	20	Widening	3rd Phase	181.43
LR_W-16	Local/Access	20	Widening	3rd Phase	370.22
LR_W-17	Local/Access	20	Widening	3rd Phase	356.45
LR_W-18	Local/Access	20	Widening	3rd Phase	126.80
LR_W-19	Local/Access	20	Widening	3rd Phase	513.01
LR_W-20	Local/Access	20	Widening	3rd Phase	291.95
LR_W-21	Local/Access	20	Widening	3rd Phase	176.90
LR_W-22	Local/Access	20	Widening	3rd Phase	250.61
LR_W-23	Local/Access	20	Widening	3rd Phase	290.30
LR_W-24	Local/Access	20	Widening	3rd Phase	227.35
LR_W-25	Local/Access	20	Widening	3rd Phase	440.29
LR_W-26	Local/Access	20	Widening	3rd Phase	165.81
LR_W-27	Local/Access	20	Widening	3rd Phase	71.28
PR_N-02	Regional	120	New Construction	1st Phase	1055.95
PR_W-11	Primary	80	Widening	1st Phase	1111.56
PR_W-12	Primary	80	Widening	1st Phase	68.89
PR_W-13	Primary	80	Widening	1st Phase	855.84
PR_W-14	National	150	Widening	1st Phase	723.77
PR_W-15	Primary	80	Widening	1st Phase	310.58

Proposed Road Id	Proposed Road Type	Proposed ROW (Feet)	Proposed Status	Phasing	Length (M)
PR_W-16	Primary	80	Widening	1st Phase	48.25
PR_W-17	Regional	120	Widening	1st Phase	833.61
PR_W-18	Primary	60	Widening	1st Phase	509.66
PR_W-19	Primary	80	Widening	1st Phase	821.71
SR_N-01	Secondary	40	New Construction	2nd Phase	192.38
SR_N-02	Secondary	40	New Construction	2nd Phase	170.32
SR_N-03	Secondary	40	New Construction	2nd Phase	202.30
SR_W-09	Secondary	40	Widening	2nd Phase	10.78
SR_W-10	Secondary	40	Widening	2nd Phase	969.51
SR_W-11	Secondary	40	Widening	2nd Phase	995.34
SR_W-12	Secondary	40	Widening	2nd Phase	438.22
TR_W-03	Tertiary	30	Widening	2nd Phase	763.13
TR_W-04	Tertiary	30	Widening	2nd Phase	456.09
WW_N-05	Walkway	15	New Construction	2nd Phase	259.21
WW_N-06	Walkway	15	New Construction	2nd Phase	258.43
WW_N-07	Walkway	15	New Construction	2nd Phase	346.48
WW_N-08	Walkway	15	New Construction	2nd Phase	361.95
WW_N-09	Walkway	15	New Construction	2nd Phase	250.33
WW_N-10	Walkway	15	New Construction	2nd Phase	256.11
WW_N-11	Walkway	15	New Construction	2nd Phase	10.97

14.3.3.4 Drainage Development Plan

Among the natural drainage facilities, Chitra River passes through the western border of this Ward. The proposed drainage facilities will be developed based on this natural water body. The river will serve as primary drain and will be connected with 10 m secondary drain and 53 m tertiary drain. Table 14.5 shows the Summary.

Table 14. 5: Proposed Drainage Development Plan Proposals

Proposed Drain ID	Proposed Drain Type	Proposed Width (M)	Proposed Status	Phasing	Length (KM)
SD-02	Secondary	1.50	New Construction	Second Phase	9.21
SD-03	Secondary	1.50	New Construction	Third Phase	1.70
SD-04	Secondary	1.50	Widening	Second Phase	1.00
TD-02	Tertiary	1.00	New Construction	Second Phase	6.91
TD-03	Tertiary	1.00	New Construction	Third Phase	4.55
TD-04	Tertiary	1.00	Widening	Second Phase	1.06
Ward No. 01 Total					24.43

14.3.3.5 Urban Services

a. Solid Waste Management

Solid waste management is a major urban service. As density of population increases the volume of solid waste also increases proportionately. However, the income level is a major factor that influences the volume of solid waste. Population and the volume of waste in the Paurashava are yet to be large enough to become a problem for the city. But the present management system is not satisfactory and it might lead to problem in future. The consultant proposes 2.74 acres of solid waste transfer station and an Effluent Treatment Plant (ETP) of 0.33 to treatment the industrial wastes in this Ward to serve the Paurashava. It is recommended that home collection system is introduced in the Ward by creation of local CBOs. This will cause organized collection of waste and prevent indiscriminate littering.

Table 14. 6: Urban Development Proposals of Ward 01

Development Proposal Type	Development Proposal Name	Proposal ID	Phasing	Mouza Name_JL No._Sheet No.	Plot No.	Area (Acres)
Commercial Zone	Neighborhood Market	NM-01	1st Phase	Kaligonj_17_02	821-823, 825	0.33
		NM-02	1st Phase	Kaligonj_17_02	659, 660	0.77
Education & Research Zone	Primary school	PS-01	1st Phase	Kaligonj_17_02	753	0.32
Health Facilities	Maternity Clinic	MC-01	1st Phase	Sreerampur_18_00	486-488	0.90
Heavy Industrial Zone	Heavy Industrial Area	HIA-01	3rd Phase	Sreerampur_18_00	600, 611, 612, 628, 714-781, 791-803, 817, 818, 861, 865-868, 1045-1047	19.13
		HIA-02	3rd Phase	Sreerampur_18_00	644, 645, 648-671	7.76
Mixed Use Zone	Ward Councilor's office	WC-01	1st Phase	Kaligonj_17_02	433-438, 825	0.88
Open Space	Central Park	CP-01	1st Phase	Kaligonj_17_02	743, 779-809, 825, 1097	12.55
			2nd Phase	Kaligonj_17_02	682, 719, 720, 724, 725, 729, 731-743, 1088	5.65
	Park	P-01	1st Phase	Kaligonj_17_02	1097	1.02
		P-02	1st Phase	Kaligonj_17_02	1031-1034, 1071, 1097	0.74
	Stadium	S-01	1st Phase	Kaligonj_17_02	253, 256, 281-290, 292-298, 335-339, 345	7.20
Transportation Facilities	Bus terminal	BT-01	1st Phase	Kaligonj_17_02	404, 414-422, 561, 562, 565, 566, 569, 570, 573-581, 584	5.65
	Tempo Stand	TS-01	3rd Phase	Kaligonj_17_02	341	0.36
Utility Services	ETP	ETP	3rd Phase	Sreerampur_18_00	1042-1044	0.33
	Surface water Treatment	WTP-01	1st Phase	Kaligonj_17_02	810-816, 1097	2.74
	Waste Transfer Center	WTC-01	1st Phase	Sreerampur_18_00	524	0.04
Ward No. 01 Total						66.39

b. Water Supply

It is proposed to install a network based water supply system by exploring fresh water from the Chitra River. Two water treatment plants will be established on the bank of the Chitra River at Ward no. 01 and 05 and water supply lines in this Ward will be established along all categories of roads as per the growth of the settlement from this water treatment plant.

c. Sanitation

It is apprehended that the government would not be able to provide network and treatment based sanitation system for the town. So the present system of sanitation will continue. However, the Paurashava must try to promote hygienic sanitation to ensure better public health. There is hardly any public toilet in the town to serve the visitors and the local people. The existing toilet of bus terminal area has to be developed as public toilet, which is required for the town people and as well as for the passengers waiting for departure.

**Map 14.2: Proposed Road, Drainage and Utility Services Plan for Kaliganj Paurashava
(Ward No. 01)**

14.4 Ward Action Plan for Ward No. 02

14.4.1 Demography

Ward no. 02 is located north-east part of the Paurashava boundary. In 2011, the Ward had a population of 5462 Persons only. Population projection shows that in the year 2031, the population of the Ward is now 5462 and the density 10 ppa and it will be 18 ppa in 2031. Table 14.7 shows the details.

Table 14.7: Population Statistics of Ward No. 02

Item	Year	
	2011	2031
Area (acre)	520.96	520.96
Population	5462	9126
Density of Population (per acre)	10	18

14.4.2 Critical Issues and Opportunities of the Ward

Critical Issues

Ward no. has characteristics of rural activities. There is shortage of basic facilities and infrastructures required for the area. There is no water supply system, systematic drainage and solid waste management facilities, and the area lacks in planned recreational facilities. Even the road network and other basic facilities are not up to the mark. Scattered settlements are the main obstacle for infrastructure development in this Ward.

Development Opportunities

The opportunities are similar as mentioned for Ward no. 1.

14.4.3 Ward Action Plan Proposals

14.4.3.1 Review of Existing Land Use

The maximum land of this Ward is at present used for Agricultural purpose (67.02%). Ward 02 occupies above 98.38 acres of residential land covering 18.89% of the total land. Commercial land occupies 0.72% and water bodies occupy 6.34% of the land of the Ward. Also 4.26 acres of land is used as Manufacturing and Processing Activity. The amount of land used for open spaces is very negligible (0.12%) in this Ward. Table 14.8 shows the details.

Table 14.8: Comparative Scenario of Existing and Proposed Land Uses of Ward No. 02

Sl. No.	Existing Land use	Area in Acres	%	Sl. No.	Proposed Land Use	Area in Acres	%
01	Residential	98.38	18.89	01	Urban Residential Zone	90.03	17.28
				02	Rural Settlement	103.35	19.84
02	Education & Research	11.28	2.17	03	Education & Research Zone	6.01	1.15
03	Governmental Services	0.47	0.09	04	Government Office	0.30	0.06
04	Commercial Activity	3.75	0.72	05	Commercial Zone	1.99	0.38
05	Manufacturing and Processing Activity	4.26	0.82	06	General Industrial Zone	4.68	0.90
				07	Heavy Industrial Zone	0.00	0.00

Sl. No.	Existing Land use	Area in Acres	%	Sl. No.	Proposed Land Use	Area in Acres	%
06	Mixed Use	0.61	0.12	08	Mixed Use Zone	1.84	0.35
07	Circulation Network	11.28	2.17	09	Circulation Network	47.82	9.18
08	Transport & Communication	0.11	0.02	10	Transportation Facilities	0.63	0.12
09	Community Service	0.92	0.18	11	Community Facilities	1.00	0.19
				12	Health Facilities	0.97	0.19
10	Recreational Facilities	0.00	0.00	13	Recreational Facilities	0.00	0.00
11	Agriculture	349.12	67.02	14	Agriculture Zone	218.56	41.95
12	Water Body	33.04	6.34	15	Water Body	31.23	5.99
13	Vacant Land	15.38	2.95	16	Open Space	1.61	0.31
14	Restricted	0.00	0.00	17	Restricted Area	0.00	0.00
15	Service Activity	0.95	0.18	18	Utility Services	0.22	0.04
16	Urban Green Space	0.61	0.12	19	Urban Deferred	10.57	2.03
17	Miscellaneous	0.00	0.00	20	Miscellaneous	0.16	0.03
Grand Total		520.96	100	Grand Total		520.96	100

14.4.3.2 Proposed Land Use Zoning

Urban Residential Zone

In the existing land uses, both the urban residential and rural homestead has been considered as residential use as a whole. In the Ward Action Plan for Ward no. 02, more than 90.03 acres of land has been earmarked for urban residential use, which will occupy 17.28% of the total land. It is assumed that net density of urban residential zone will be 100 ppa.

Rural Settlement

Only 103.35 acres (19.84%) of land is proposed for rural settlement. It is assumed that net density of rural homestead will be within 50 ppa.

Education and Research Zone

Total 6.01 acres (1.15%) of land is proposed for education and research. One new primary school (0.32acre) will be established at in Ward no. 02. Map 14.3 shows the location of educational institutions of Ward no. 02.

Governmental Services

Total 0.30 acres of land has been proposed under this use, there are no land proposals for non-government services.

Commercial Zone

About 1.99 acres of land has been proposed for this purpose, which occupies 0.38% of total land.

General Industry

A total of 4.68 acres of land is earmarked for general industrial zone and it shares 0.90% of total land of the Ward. The industry must be in green and orange–A category. There is no probability for heavy industrial zone in this Ward. Table 10.15 of Chapter 10, Part B of this report shows details of general industry for this Ward.

Circulation network

For any type of development, circulation network is an important facility. To improve the efficiency of the Ward activities, more roads are proposed, which will consume about 47.82 acres of land covering about 9.18% of the total area. Additional road network are proposed at Ward no.02 for the improvement of road network, widening of existing roads, link road and new roads are proposed for phase wise development within the plan period.

Transportation Facilities

One bus terminal of 5.65 acre and a tempo stand of 0.36 acres has been proposed for the transportation facilities of ward 2.

Community Facilities

A total of 1.00 acre of land will be used for community facilities covering 0.19% of the total land of Ward no. 02.

Agricultural Zone

Total 218.56 acres of land will be used as agricultural zone. It occupies 41.95% total land of Ward no. 02.

Open Space

Total of 1.61 acres of land is proposed for open space covering 0.31% of total land. The proposed open space consists of one playfield. Central Park of 18.20 acres, a park of 1.77 acres and a stadium 7.20 acres have proposed.

Water body

The plan suggests for preserving most of the water bodies for two purposes, first, to serve as source of water, second to serve as water retention area during monsoon. The ponds individually with an area equal to or more than 0.15 acre will be preserved as the water retention ponds. The total land proposed for retention area covers about 31.23 acres.

Utility Services

A proposal is made with 0.22acre of land for establishing utility services. Details are given in Table 10.21 of Chapter 10, Part B of this report.

Urban Deferred

Total 10.57 acres of land is proposed as urban deferred in this Ward. It will be used for residential purposes in future.

Map 14.3: Landuse Proposal for Kaliganj Paurashava (Ward No. 02)

14.4.3.3 Proposed Road Infrastructure Development

A total of 13.60 km of road development proposal is made in the first Ward Action Plan. Length of the local roads is 7.32 km and RoW of these roads will be 20 ft covering only 53.81% of the area proposed for total road network development. About 2.46 km length of new road is proposed for this Ward. The detailed scenario of road network development proposal is given in Table 14.09 and Table 14.10.

Table 14.9: Summary of Road Network Proposal at Ward no. 02 of Kaliganj Paurashava

Width in Ft	Type of Road	Total		New Road		Road Widening	
		Length(km)	%	Length(km)	%	Length(km)	%
20	Local/Access	7.32	53.81	1.71	69.38	5.61	50.37
40	Secondary	1.90	13.96	0.75	30.62	1.14	10.28
60	Primary	1.19	8.76	0.00	0.00	1.19	10.69
80	Primary	1.61	11.83	0.00	0.00	1.61	14.44
120	Regional	0.32	2.38	0.00	0.00	0.32	2.91
150	National	1.26	9.26	0.00	0.00	1.26	11.31
Total		13.60	100.00	2.46	100.00	11.14	100.00

Table 14.10: Road Proposal for Ward no. 02

Proposed Road Id	Proposed Road Type	Proposed ROW (Feet)	Proposed Status	Phasing	Length (M)
LR_N-07	Local/Access	20	New Construction	3rd Phase	51.65
LR_N-08	Local/Access	20	New Construction	3rd Phase	109.50
LR_N-09	Local/Access	20	New Construction	3rd Phase	91.20
LR_N-10	Local/Access	20	New Construction	3rd Phase	88.05
LR_N-11	Local/Access	20	New Construction	3rd Phase	55.25
LR_N-12	Local/Access	20	New Construction	3rd Phase	148.98
LR_N-13	Local/Access	20	New Construction	3rd Phase	148.85
LR_N-14	Local/Access	20	New Construction	3rd Phase	85.80
LR_N-15	Local/Access	20	New Construction	3rd Phase	502.71
LR_N-16	Local/Access	20	New Construction	3rd Phase	99.14
LR_N-17	Local/Access	20	New Construction	3rd Phase	122.70
LR_N-18	Local/Access	20	New Construction	3rd Phase	131.38
LR_N-19	Local/Access	20	New Construction	3rd Phase	71.49
LR_W-28	Local/Access	20	Widening	3rd Phase	42.47
LR_W-29	Local/Access	20	Widening	3rd Phase	37.77
LR_W-30	Local/Access	20	Widening	3rd Phase	87.92
LR_W-31	Local/Access	20	Widening	3rd Phase	329.18
LR_W-32	Local/Access	20	Widening	3rd Phase	75.66
LR_W-33	Local/Access	20	Widening	3rd Phase	50.51
LR_W-34	Local/Access	20	Widening	3rd Phase	43.76
LR_W-35	Local/Access	20	Widening	3rd Phase	45.25
LR_W-36	Local/Access	20	Widening	3rd Phase	50.65
LR_W-37	Local/Access	20	Widening	3rd Phase	232.74
LR_W-38	Local/Access	20	Widening	3rd Phase	54.80
LR_W-39	Local/Access	20	Widening	3rd Phase	322.35
LR_W-40	Local/Access	20	Widening	3rd Phase	725.85
LR_W-41	Local/Access	20	Widening	3rd Phase	481.49
LR_W-42	Local/Access	20	Widening	3rd Phase	63.83
LR_W-43	Local/Access	20	Widening	3rd Phase	323.32
LR_W-44	Local/Access	20	Widening	3rd Phase	280.36
LR_W-45	Local/Access	20	Widening	3rd Phase	353.87
LR_W-46	Local/Access	20	Widening	3rd Phase	659.58
LR_W-47	Local/Access	20	Widening	3rd Phase	55.72
LR_W-48	Local/Access	20	Widening	3rd Phase	157.79
LR_W-49	Local/Access	20	Widening	3rd Phase	110.49
LR_W-50	Local/Access	20	Widening	3rd Phase	462.96
LR_W-51	Local/Access	20	Widening	3rd Phase	165.53
LR_W-52	Local/Access	20	Widening	3rd Phase	181.52
LR_W-53	Local/Access	20	Widening	3rd Phase	132.23

Proposed Road Id	Proposed Road Type	Proposed ROW (Feet)	Proposed Status	Phasing	Length (M)
LR_W-54	Local/Access	20	Widening	3rd Phase	77.61
PR_W-20	Primary	80	Widening	1st Phase	976.64
PR_W-21	National	150	Widening	1st Phase	1259.14
PR_W-22	Primary	80	Widening	1st Phase	636.71
PR_W-23	Regional	120	Widening	1st Phase	324.17
PR_W-24	Primary	60	Widening	1st Phase	244.40
PR_W-25	Primary	60	Widening	1st Phase	425.36
PR_W-26	Primary	60	Widening	1st Phase	520.90
SR_N-04	Secondary	40	New Construction	2nd Phase	752.63
SR_W-13	Secondary	40	Widening	2nd Phase	392.22
SR_W-14	Secondary	40	Widening	2nd Phase	522.60
SR_W-15	Secondary	40	Widening	2nd Phase	301.40

14.4.3.4 Drainage Development Plan

There is no man-made drainage facility at Ward no. 02. Existing drainage is mostly depending on natural drainage facilities. Total 10.18 km secondary drain and 11.07 km tertiary drain is proposed in this ward. Table 14.11 shows the Summary.

Table 14.11: Proposed Drainage Development Plan Proposals

Proposed Drain ID	Proposed Drain Type	Proposed Width (M)	Proposed Status	Phasing	Length (KM)
SD-05	Secondary	1.50	New Construction	Second Phase	3.21
SD-06	Secondary	1.50	New Construction	Third Phase	6.13
SD-07	Secondary	1.50	Widening	Second Phase	0.81
SD-08	Secondary	1.50	Widening	Third Phase	0.04
TD-05	Tertiary	1.00	New Construction	Second Phase	3.16
TD-06	Tertiary	1.00	New Construction	Third Phase	7.57
TD-07	Tertiary	1.00	Widening	Second Phase	0.34
Ward No. 02 Total					21.25

14.4.3.5 Urban Services

a. Solid Waste Management

Solid waste management is more or less the same throughout the Paurashava. It is recommended that home collection system is introduced in the Ward by creation of local CBOs. This will cause organized collection of waste and prevent indiscriminate littering. There is a proposal for waste transfer station of 0.23 acre for the management of solid waste.

Table 14.12: Urban Development Proposals of Ward 02

Development Proposal Type	Development Proposal Name	Proposal ID	Phasing	Mouza Name_JL No._Sheet No.	Plot No.	Area (Acres)
Commercial Zone	Neighborhood Market	NM-03	1st Phase	Foila_29_00	18	0.82
		NM-04	3rd Phase	Paikpara_14_00	102, 103	0.40
		NM-05	3rd Phase	Bakulia_16_00	285, 286, 288	0.15
Education & Research Zone	Primary school	PS-02	1st Phase	Kaligonj_17_02	869, 874, 875, 886	1.58
	Secondary School	SS-01	3rd Phase	Khayertala_15_00	70-72, 81, 279, 289-294	2.23
	Vocational Training Center	VTC-01	3rd Phase	Khayertala_15_00	221, 223, 275	1.55
Health Facilities	Maternity Clinic	MC-02	3rd Phase	Bakulia_16_00	309, 417, 419-424	0.20

Development Proposal Type	Development Proposal Name	Proposal ID	Phasing	Mouza Name_JL No._Sheet No.	Plot No.	Area (Acres)
			3rd Phase	Khayertala_15_00	143, 144, 145	0.77
Mixed Use Zone	Ward Councilor's office	WC-02	1st Phase	Paikpara_14_00	152	0.61
Open Space	Playground	PG-01	3rd Phase	Khayertala_15_00	277, 279-281	1.43
Transportation Facilities	Tempo Stand	TS-02	1st Phase	Kaligonj_17_02	929, 930	0.11
		TS-03	3rd Phase	Paikpara_14_00	146, 147	0.42
Utility Services	Slaughter House	SH-01	1st Phase	Foila_29_00	17	0.05
	Waste Transfer Center	WTC-02	1st Phase	Khayertala_15_00	42, 98, 99, 103, 104	0.17
Ward No. 02 Total						10.48

b. Water Supply and sanitation

It is proposed to install a network based water supply system by exploring fresh water from the Chitra River. Two water treatment plants will be established on the bank of the Chitra River at Ward no. 01 and 05 and water supply lines in this Ward will be established along all categories of roads as per the growth of the settlement from this water treatment plant.

It is apprehended that the government would not be able to provide network and treatment based sanitation system for the town. So the present system of sanitation will continue. However, the Paurashava must try to promote hygienic sanitation to ensure better public health. There is hardly any public toilet in the town to serve the visiting and the local people.

**Map 14.4: Proposed Road, Drainage and Utility Services Plan for Kaliganj Paurashava
(Ward No. 02)**

14.5 Ward Action Plan for Ward No.03

14.5.1 Demography

Ward no. 3 is located on the western part of the town. In 2011, the Ward had a population of 6245 persons. Population projection shows that 10435 people will be living in the Ward in the year 2031 with a density of 30 persons per acre. Table 14.13 shows the details.

Table 14.13: Population Statistics of Ward No. 03

Item	Year	
	2011	2031
Area (acre)	352.99	352.99
Population	6245	10435
Density of Population (per acre)	18	30

14.5.2 Critical Issues and Opportunities of the Ward

Critical Issues

Ward no.03 is one of the most important areas with urban characteristics. The main administrative, commercial, educational establishments are located in this ward. The picture for basic facilities and infrastructures are similar as other wards of the Paurashava. The total length of roads in the ward is not sufficient. Unpaved roads turn miserable during monsoon making movement more difficult. Now poor drainage network serves the whole ward no 03. Again, very low density and scattered settlements are the main obstacle for infrastructure development.

Development Opportunities

As Kaliganj is a small town with less diversified activities the opportunities for future development are almost similar for the entire Paurashava.

Jhenaidah, the district headquarter is only one hour journey from Kaliganj. Koatchandpur and Bagherpara (Jessore) are located on the boundary of Kaliganj. It takes about 1/2 hour from Kaliganj to reach those Paurashavas.

14.5.3 Ward Action Plan Proposals

14.5.3.1 Review of Existing Land Use

Out of total 352.99 acre of land of only 71.56 acre (20.27%) is used as residential purpose. About 231.19 acres (65.49%) are used in agricultural use. Water bodies occupy 5.20% of land of the ward where as 1.63% is laid vacant. At present 4.28 acres of land are used in commercial purpose. 2.26% is used as circulation network. Only 4.28 acre of land is used for community facilities. Urban green space occupies a negligible percentage (0.36%) and no recreational facilities are available here.

Table 14.14: Comparative Scenario of Existing Land Use and Proposed Land Use of Ward no. 03

Sl. No.	Existing Land use	Area in Acres	%	Sl. No.	Proposed Land Use	Area in Acres	%
01	Residential	71.56	20.27	01	Urban Residential Zone	137.11	38.84
				02	Rural Settlement	0.00	0.00
02	Education & Research	7.97	2.26	03	Education & Research Zone	3.79	1.07
03	Governmental Services	4.08	1.16	04	Government Office	3.57	1.01
04	Commercial Activity	4.28	1.21	05	Commercial Zone	4.13	1.17
05	Manufacturing and Processing Activity	0.31	0.09	06	General Industrial Zone	0.00	0.00
				07	Heavy Industrial Zone	0.00	0.00
06	Mixed Use	2.00	0.57	08	Mixed Use Zone	2.00	0.57
07	Circulation Network	7.97	2.26	09	Circulation Network	30.72	8.70
08	Transport & Communication	0.18	0.05	10	Transportation Facilities	0.23	0.06
09	Community Service	1.68	0.48	11	Community Facilities	2.53	0.72
				12	Health Facilities	0.00	0.00
10	Recreational Facilities	0.00	0.00	13	Recreational Facilities	0.00	0.00
11	Agriculture	231.19	65.49	14	Agriculture Zone	146.03	41.37
12	Water Body	18.37	5.20	15	Water Body	18.13	5.14
13	Vacant Land	5.76	1.63	16	Open Space	4.63	1.31
14	Restricted	0.00	0.00	17	Restricted Area	0.00	0.00
15	Service Activity	0.26	0.07	18	Utility Services	0.02	0.01
16	Urban Green Space	1.28	0.36	19	Urban Deferred	0.00	0.00
17	Miscellaneous	0.00	0.00	20	Miscellaneous	0.11	0.03
Grand Total		352.99	100	Grand Total		352.99	100

14.5.3.2 Proposed Land Use Zoning

Urban Residential Area

In existing land uses has been considered the urban residential as residential use as a whole. In Ward Action Plan more than 137.11 acre of land has been earmarked for urban residential use which will occupy 38.84% of the total land.

Education and Research Zone

More than 3.79 acres of land has been proposed for education and research. One primary school will be established in ward no. 03. Those will be located at both fringe and peripheral area of ward no. 03.

Governmental Services

For administrative use 3.57 acres of land is proposed. This occupies 1.01% of total ward no. 03.

Commercial Zone

Total 4.13 acre of land is allocated for commercial use. In the allocated mixed use zone, more commercial activities will be operated. One neighborhood market of 0.30 acre is proposed for this ward.

Circulation network

For any type of development circulation network is any important facility. To improve the efficiency of the ward more roads are proposed which will consume 30.72 acre of land and almost 8.70% of the total area. For network improvement widening of existing road, link road and new roads are proposed which will be done phase wise within 2031.

Transport and Communication

Total 0.23 lands will be used for transport and communication in Ward no. 03.

Community Facilities

Land for community facilities is proposed to be 2.53 acre in this Ward.

Agricultural Zone

Total 146.03 acre of land is proposed for agricultural activities which covers 41.37% of total land of ward 03.

Open Space

Total 4.63 acres of land is proposed for open space, which consist of 1.31% of the Ward. Here, one local park and one playground are proposed. Details are given in Table 10.18 of Chapter 10, Part B of this report.

Water Bodies

The plan suggests preserving most of the water bodies for two purposes, first, to serve as source of water, second to serve as water retention area during monsoon. The ponds with an area equal to or more than 0.15 acres will be preserved as the water retention ponds. The proposed retention area covers about 18.13 acre of land which will cover more than 5.14% of the total land of the Ward.

Map 14.5: Landuse Proposal for Kaliganj Paurashava (Ward No. 03)

14.5.3.3 Proposed Road Infrastructure Development

Total 12.64 km road development proposal has been proposed in first Ward Action Plan for Ward no. 03 of Kaliganj Paurashava. About 4.73 km local road has been proposed for this ward for improvement. Length of the tertiary road will be 2.27 km and width of these roads will be 30 ft and it covers 17.97% of total road network development proposal. Length of secondary road will be 0.79 km and RoW will be 40 ft. Total length of Primary road will be 1.78 km and width of these roads will be varied from 60 ft and 1.15 km of 80 ft for this Ward. Detailed scenario of road network development proposal is given in Table 14.15.

Table 14.15: Summary of Road Network Proposal at Ward no. 03 of Kaliganj Paurashava

Width in Ft	Type of Road	Total		New Road		Road Widening	
		Length(km)	%	Length(km)	%	Length(km)	%
15	Walkway	1.90	15.07	1.90	51.26	0.00	0.00
20	Local/Access	4.73	37.46	1.36	36.55	3.38	37.84
30	Tertiary	2.27	17.97	0.00	0.00	2.27	25.46
40	Secondary	0.79	6.26	0.00	0.00	0.79	8.87
60	Primary	1.78	14.12	0.45	12.19	1.33	14.92
80	Primary	1.15	9.11	0.00	0.00	1.15	12.90
Total		12.64	100.00	3.72	100.00	8.92	100.00

Table 14.16: Road Proposal for Ward no. 03

Proposed Road Id	Proposed Road Type	Proposed ROW (Feet)	Proposed Status	Phasing	Length (M)
LR_N-20	Local/Access	20	New Construction	3rd Phase	165.97
LR_N-21	Local/Access	20	New Construction	3rd Phase	783.97
LR_N-22	Local/Access	20	New Construction	3rd Phase	111.34
LR_N-23	Local/Access	20	New Construction	3rd Phase	59.45
LR_N-24	Local/Access	20	New Construction	3rd Phase	40.42
LR_N-25	Local/Access	20	New Construction	3rd Phase	26.44
LR_N-26	Local/Access	20	New Construction	3rd Phase	129.99
LR_N-27	Local/Access	20	New Construction	3rd Phase	40.48
LR_W-55	Local/Access	20	Widening	3rd Phase	70.39
LR_W-56	Local/Access	20	Widening	3rd Phase	145.58
LR_W-57	Local/Access	20	Widening	3rd Phase	450.93
LR_W-58	Local/Access	20	Widening	3rd Phase	166.97
LR_W-59	Local/Access	20	Widening	3rd Phase	76.56
LR_W-60	Local/Access	20	Widening	3rd Phase	158.97
LR_W-61	Local/Access	20	Widening	3rd Phase	91.12
LR_W-62	Local/Access	20	Widening	3rd Phase	131.00
LR_W-63	Local/Access	20	Widening	3rd Phase	141.49
LR_W-64	Local/Access	20	Widening	3rd Phase	112.96
LR_W-65	Local/Access	20	Widening	3rd Phase	110.76
LR_W-66	Local/Access	20	Widening	3rd Phase	83.10
LR_W-67	Local/Access	20	Widening	3rd Phase	122.82
LR_W-68	Local/Access	20	Widening	3rd Phase	331.13
LR_W-69	Local/Access	20	Widening	3rd Phase	79.11
LR_W-70	Local/Access	20	Widening	3rd Phase	281.38
LR_W-71	Local/Access	20	Widening	3rd Phase	193.33
LR_W-72	Local/Access	20	Widening	3rd Phase	244.39
LR_W-73	Local/Access	20	Widening	3rd Phase	222.60
LR_W-74	Local/Access	20	Widening	3rd Phase	98.77
LR_W-75	Local/Access	20	Widening	3rd Phase	62.56
PR_N-03	Primary	60	New Construction	1st Phase	330.99
PR_N-04	Primary	60	New Construction	1st Phase	121.99
PR_W-27	Primary	80	Widening	1st Phase	1150.56
PR_W-28	Primary	60	Widening	1st Phase	1186.10

Proposed Road Id	Proposed Road Type	Proposed ROW (Feet)	Proposed Status	Phasing	Length (M)
PR_W-29	Primary	60	Widening	1st Phase	163.37
SR_W-16	Secondary	40	Widening	2nd Phase	476.23
SR_W-17	Secondary	40	Widening	2nd Phase	315.44
TR_W-05	Tertiary	30	Widening	2nd Phase	998.16
TR_W-06	Tertiary	30	Widening	2nd Phase	881.52
TR_W-07	Tertiary	30	Widening	2nd Phase	411.29
WW_N-13	Walkway	15	New Construction	2nd Phase	12.16
WW_N-14	Walkway	15	New Construction	2nd Phase	303.38
WW_N-15	Walkway	15	New Construction	2nd Phase	149.46
WW_N-16	Walkway	15	New Construction	2nd Phase	25.92
WW_N-17	Walkway	15	New Construction	2nd Phase	44.04
WW_N-18	Walkway	15	New Construction	2nd Phase	172.34
WW_N-19	Walkway	15	New Construction	2nd Phase	53.71
WW_N-20	Walkway	15	New Construction	2nd Phase	1148.05

14.5.3.4 Drainage Development Plan

Existing drainage is mostly depending on natural drainage facilities. A big khal which is passing through the eastern side of the Ward boundary will serve as primary drain and will be connected with proposed 7.45 km secondary drain and 10.15 km tertiary drain. Table 14.17 shows the summary.

Table 14. 17: Proposed Drainage Development Plan Proposals

Proposed Drain ID	Proposed Drain Type	Proposed Width (M)	Proposed Status	Phasing	Length (KM)
SD-09	Secondary	1.50	New Construction	Second Phase	3.04
SD-10	Secondary	1.50	New Construction	Third Phase	4.00
SD-11	Secondary	1.50	Widening	Second Phase	0.40
TD-08	Tertiary	1.00	New Construction	Second Phase	2.25
TD-09	Tertiary	1.00	New Construction	Third Phase	7.20
TD-10	Tertiary	1.00	Widening	Second Phase	0.71
Ward No. 03 Total					17.60

Besides, it will be necessary to re-excavate the khals that serve as primary drains. The consultants have identified that the existing khals that need to be re-excavated for the smooth flow of water through them.

14.5.3.5 Urban Services

a. Solid Waste Management

Solid waste management is a major urban service. As density of population increases, the volume of solid waste increases proportionately. The consultant proposes waste transfer station with 0.02 acre area behind BRAC School. It is recommended that home collection system is introduced in the Ward by creation of local CBOs. This will cause organized collection of waste and prevent indiscriminate littering.

Table 14.18: Urban Development Proposals of Ward 03

Development Proposal Type	Development Proposal Name	Proposal ID	Phasing	Mouza Name_JL No. Sheet No.	Plot No.	Area (Acres)
Commercial Zone	Neighborhood Market	NM-06	1st Phase	Foila_29_00	576, 577	0.30
Education & Research Zone	Primary school	PS-03	1st Phase	Foila_29_00	597, 598	0.18
Mixed Use Zone	Ward Councilor's	WC-03	1st Phase	Foila_29_00	274	0.39

Development Proposal Type	Development Proposal Name	Proposal ID	Phasing	Mouza Name_JL No. Sheet No.	Plot No.	Area (Acres)
	office					
Open Space	Park	P-03	1st Phase	Foila_29_00	99999	0.51
		P-04	1st Phase	Foila_29_00	99999	0.08
		P-05	1st Phase	Foila_29_00	99999	0.08
		P-06	1st Phase	Foila_29_00	99999	0.24
		P-07	1st Phase	Foila_29_00	99999	0.39
			1st Phase	Kaligonj_17_02	1097	0.01
		P-08	1st Phase	Foila_29_00	630, 631, 634-637, 912, 913, 9999, 99999	1.19
			1st Phase	Kaligonj_17_02	1097	0.32
	Playground	PG-02	1st Phase	Foila_29_00	658, 659	0.95
Transportation Facilities	Tempo Stand	TS-04	1st Phase	Foila_29_00	516	0.19
Utility Services	Waste Transfer Center	WTC-03	1st Phase	Foila_29_00	594	0.02
Ward No. 03 Total						4.84

b. Water Supply and sanitation

The proposed water treatment plant and the water supply system will expected to improve the water supply condition of the Paurashava as a whole after the implementation of this Master Plan.

The Paurashava must try to promote hygienic sanitation to ensure better public health. There is hardly any public toilet in the town to serve the visitors and the local people.

**Map 14. 6: Proposed Road, Drainage and Utility Services Plan for Kaliganj Paurashava
(Ward No. 03)**

14.6 Ward Action Plan for Ward No.4

14.6.1 Demography

Ward No. 4 is located on the most southern-east part of the town. It has a medium density of population. In 2011, the Ward had a population of 3145 persons. Population projection shows that 5255 people will be living in the Ward in the year 2031 with a very low density of 19 persons per acre. Table 14.19 shows the details.

Table 14.19: Population Statistics of Ward No. 04

Item	Year	
	2011	2031
Area (acre)	281.33	281.33
Population	3145	5255
Density of Population (per acre)	11	19

14.6.2 Critical Issues and Opportunities of the Ward

Ward no. 04 is located on the south-eastern side of the Paurashava with mostly rural and scattered settlements. The basic facilities and infrastructure required for an urban area are not yet established here. There is no systematic drainage and solid waste management facilities, lack of recreational and educational facilities. Even the road network and other basic facilities are not up to the mark. The total area of roads in the Ward is only 4.70 acres. Again, very low density and scattered settlements are the main obstacles for infrastructure development.

Development Opportunities

As Kaliganj is a small town with less diversified activities the opportunities for future development are almost similar for the entire Paurashava.

14.6.3 Ward Action Plan Proposals

14.6.3.1 Review of Existing Land Use

This Ward is rural in character. Out of the total 281.33 acres, 228.56 acres of land i.e. 81.24% is used for agriculture. For residential land, 42.09 acres are used. It occupies more than 14.96% of total land. Water bodies occupy only 0.54% land of the Ward. Total 4.70 acres of land is used for educational purpose. At present, only 0.49 acre of land is used for commercial purpose, while 1.67% is used for circulation network. No government and non-government establishments, land for transport and communication, recreational facilities area does not exist in this Ward.

14.6.3.2 Proposed Land Use Zoning

Urban Residential Zone

In the existing land uses, both the urban residential and rural homestead has been considered as residential use as a whole. In Ward Action Plan, about 73.63 acres of land has been earmarked for urban residential use which will occupy more than 26.17% of the total land. It is assumed that net density within this area will be 100 ppa in the year 2031.

Commercial Zone

Very negligible portion, only 0.59 acre area will be as commercial zone for ward no. 04 in Kaliganj Paurashava.

Circulation network

For any type of development circulation network is any important facility. To improve the efficiency of the Ward, more roads are proposed which will consume 16.38 acres of land and more than 5.82% of the total area. For network improvement widening of existing road, link road and new roads are proposed which will be done phase wise within 2031.

Table 14.20: Comparative Existing Land Use and Proposed Land Use of Ward No. 04

Sl. No.	Existing Land use	Area in Acres	%	Sl. No.	Proposed Land Use	Area in Acres	%
01	Residential	42.09	14.96	01	Urban Residential Zone	73.63	26.17
				02	Rural Settlement	0.00	0.00
02	Education & Research	4.70	1.67	03	Education & Research Zone	1.15	0.41
03	Governmental Services	0.00	0.00	04	Government Office	0.00	0.00
04	Commercial Activity	0.49	0.17	05	Commercial Zone	0.59	0.21
05	Manufacturing and Processing Activity	0.08	0.03	06	General Industrial Zone	0.00	0.00
				07	Heavy Industrial Zone	0.00	0.00
06	Mixed Use	0.00	0.00	08	Mixed Use Zone	0.39	0.14
07	Circulation Network	4.70	1.67	09	Circulation Network	16.38	5.82
08	Transport & Communication	0.00	0.00	10	Transportation Facilities	0.00	0.00
09	Community Service	0.18	0.07	11	Community Facilities	2.09	0.74
				12	Health Facilities	0.23	0.08
10	Recreational Facilities	0.00	0.00	13	Recreational Facilities	0.00	0.00
11	Agriculture	228.56	81.24	14	Agriculture Zone	170.58	60.63
12	Water Body	1.53	0.54	15	Water Body	1.35	0.48
13	Vacant Land	0.40	0.14	16	Open Space	6.35	2.26
14	Restricted	0.00	0.00	17	Restricted Area	0.00	0.00
15	Service Activity	0.07	0.03	18	Utility Services	8.59	3.05
16	Urban Green Space	1.81	0.64	19	Urban Deferred	0.00	0.00
17	Miscellaneous	0.00	0.00	20	Miscellaneous	0.00	0.00
Grand Total		281.33	100	Grand Total		281.33	100

Community Facilities

Proposed land for community service will be increased from 0.18 acre to 2.09 acre. Total 0.74% of Ward area will be occupied by this type of land use.

Agricultural Zone

The Paurashava including Ward no. 04 has a vast area of agricultural land that demands formation of a separate zone like, agriculture zone. Existing agricultural land of Ward no. 4 is 228.74 acres. Due to development changes in the Ward, only 170.58 acres of land will remain for agriculture covering 60.63% of the total land up to the year 2031.

Open Space

Total 6.35 acres of land will be used for urban open space which covers 2.26% of total land of the Ward no. 04 of Kaliganj Paurashava.

Water Body

The plan suggests preserving most of the water bodies for two purposes, first, to serve as source of water, second to serve as water retention area during monsoon. The ponds with an area equal to or more than 0.15 acre will be preserved as the water retention ponds. The proposed retention area occupies about 1.35 acres of the total land of the Ward.

Map 14.7: Landuse Proposal for Kaliganj Paurashava (Ward No. 04)

14.6.3.3 Proposed Road Infrastructure Development

Total 7.05 km road development proposal have been proposed in the first Ward Action Plan for Ward no. 04 of Kaliganj Paurashava. Length of the local road will be 3.33 km and width of these roads will be 20 ft and covering 47.21% of total road network development proposal. Length of secondary road for this Ward will be 2.29 km. Detailed scenario of road network development proposal is given in Table 14.21.

Table 14.21: Summary of Road Network Proposal at ward no. 04 of Kaliganj Paurashava

Width in Ft	Type of Road	Total		New Road		Road Widening	
		Length(km)	%	Length(km)	%	Length(km)	%
15	Walkway	0.30	4.26	0.30	52.97	0.00	0.00
20	Local/Access	3.33	47.21	0.27	47.03	3.06	47.23
30	Tertiary	0.37	5.25	0.00	0.00	0.37	5.71
40	Secondary	2.29	32.53	0.00	0.00	2.29	35.38
60	Primary	0.76	10.74	0.00	0.00	0.76	11.68
Total		7.05	100.00	0.57	100.00	6.48	100.00

Table 14.22: Road Proposal for Ward no. 04

Proposed Road Id	Proposed Road Type	Proposed ROW (Feet)	Proposed Status	Phasing	Length (M)
LR_N-28	Local/Access	20	New Construction	3rd Phase	157.48
LR_N-29	Local/Access	20	New Construction	3rd Phase	63.38
LR_N-30	Local/Access	20	New Construction	3rd Phase	45.96
LR_W-76	Local/Access	20	Widening	3rd Phase	294.95
LR_W-77	Local/Access	20	Widening	3rd Phase	238.83
LR_W-78	Local/Access	20	Widening	3rd Phase	75.48
LR_W-79	Local/Access	20	Widening	3rd Phase	40.74
LR_W-80	Local/Access	20	Widening	3rd Phase	562.05
LR_W-81	Local/Access	20	Widening	3rd Phase	111.11
LR_W-82	Local/Access	20	Widening	3rd Phase	90.93
LR_W-83	Local/Access	20	Widening	3rd Phase	155.62
LR_W-84	Local/Access	20	Widening	3rd Phase	403.68
LR_W-85	Local/Access	20	Widening	3rd Phase	168.32
LR_W-86	Local/Access	20	Widening	3rd Phase	43.36
LR_W-87	Local/Access	20	Widening	3rd Phase	266.57
LR_W-88	Local/Access	20	Widening	3rd Phase	145.59
LR_W-89	Local/Access	20	Widening	3rd Phase	89.21
LR_W-90	Local/Access	20	Widening	3rd Phase	151.42
LR_W-91	Local/Access	20	Widening	3rd Phase	115.70
LR_W-92	Local/Access	20	Widening	3rd Phase	108.86
PR_W-30	Primary	60	Widening	1st Phase	757.42
SR_W-18	Secondary	40	Widening	2nd Phase	1174.59
SR_W-19	Secondary	40	Widening	2nd Phase	1021.03
SR_W-20	Secondary	40	Widening	2nd Phase	100.97
TR_W-08	Tertiary	30	Widening	2nd Phase	370.36
WW_N-21	Walkway	15	New Construction	2nd Phase	74.46
WW_N-22	Walkway	15	New Construction	2nd Phase	80.20
WW_N-23	Walkway	15	New Construction	2nd Phase	48.07
WW_N-24	Walkway	15	New Construction	2nd Phase	36.01
WW_N-25	Walkway	15	New Construction	2nd Phase	57.05

**Map 14.8: Proposed Road, Drainage and Utility Services Plan for Kaliganj Paurashava
(Ward No. 04)**

14.6.3.4 Drainage Development Plan

The proposed drainage facilities will be developed based on this natural channel. Proposal has been made for 3.59 km secondary drain and 4.93 km tertiary drain. Table 14.23 shows the Summary.

Table 14. 23: Proposed Drainage Development Plan Proposals

Proposed Drain ID	Proposed Drain Type	Proposed Width (M)	Proposed Status	Phasing	Length (KM)
SD-12	Secondary	1.50	New Construction	Third Phase	3.28
SD-13	Secondary	1.50	Widening	Third Phase	0.31
TD-11	Tertiary	1.00	New Construction	Third Phase	4.54
TD-12	Tertiary	1.00	Widening	Third Phase	0.39
Ward No. 04 Total					8.52

14.6.3.5 Urban Services

Urban Utility Services

There is no proposal for utility services like, electricity, gas facilities and water supply system. There is a proposal for central waste disposal ground or waste dumping ground of 8.56 acres in ward 04.

Table 14.24: Urban Development Proposals of Ward 04

Development Proposal Type	Development Proposal Name	Proposal ID	Phasing	Mouza Name_JL No. Sheet No.	Plot No.	Area (Acres)
Commercial Zone	Neighborhood Market	NM-07	2nd Phase	Helai_34_00	453	0.39
Health Facilities	Maternity Clinic	MC-03	2nd Phase	Helai_34_00	578	0.23
Mixed Use Zone	Ward Councilor's office	WC-04	1st Phase	Helai_34_00	504, 511	0.39
Utility Services	Dumping Station	DS-01	2nd Phase	Helai_34_00	297, 303-320, 754, 755, 782	8.56
Ward No. 04 Total						9.57

Water Supply and Sanitation

The proposed water treatment plant and the water supply system will improve the water supply condition of the Paurashava as a whole after the implementation of this Master Plan. The Paurashava must try to promote hygienic sanitation to ensure better public health for the entire Paurashava.

14.7 Ward Action Plan for Ward No.5

14.7.1 Demography

Ward No. 5 is located in the middle part of the town and the largest ward in terms of ward boundary. It is the most important Ward for its communication and road network, and commercial uses. It has a low density of population. In 2011, the Ward had a population of 8150 persons. The most interesting feature of this Ward was that the female and male ratios are same. The ratio was 100:100. Population projection shows that 13618 people will be living in the year 2031 with a density of 68 persons per acre only. Table 14.24 shows the details.

Table 14.25: Population Statistics of ward no. 05

Item	Year	
	2011	2031
Area (acre)	199.22	199.22
Population	8150	13618
Density of Population (per acre)	41	68

14.7.2 Critical Issues and Opportunities of the Ward

Critical Issues

The basic facilities and infrastructure required for an urban area are established here. It is the core part of the Paurashava. There is insufficient water body in this Ward.

The total area of roads in the Ward is 7.88 acres of which most of the roads are paved. Unpaved roads turn miserable during monsoon making movement more difficult. Another problem of roads is that they are meandering in their layout. Due to unplanned development, roads do not have proper linkage. Due to missing links one has to travel long way to reach a nearby destination.

Development Opportunities

As Kaliganj is a small town with less diversified activities, the opportunities for future development are almo

14.7.3 Ward Action Plan Proposals

14.7.3.1 Review of Existing Land Use

Though this Ward is rural and mostly residential in character, it is the core area of the Paurashava. Out of total 199.22 acres of land i.e. 53.57 acres is used as agricultural use. 41.17% land is used for residential purpose covering about 82.02 acres. Water bodies occupy only 10% land of the Ward. At present, only 13.44 acres of land are used for commercial purpose, only 17.65% land is vacant and 3.95% land is used as circulation network.

Table 14.26: Comparative Existing Land Use and Proposed Land Use of Ward No. 05

Sl. No.	Existing Land use	Area in Acres	%	Sl. No.	Proposed Land Use	Area in Acres	%
01	Residential	82.02	41.17	01	Urban Residential Zone	130.36	65.44
				02	Rural Settlement	0.00	0.00
02	Education & Research	7.88	3.95	03	Education & Research Zone	3.84	1.93
03	Governmental Services	1.30	0.65	04	Government Office	1.11	0.56
04	Commercial Activity	13.44	6.75	05	Commercial Zone	12.01	6.03
05	Manufacturing and Processing Activity	0.34	0.17	06	General Industrial Zone	0.00	0.00
				07	Heavy Industrial Zone	0.00	0.00
06	Mixed Use	3.65	1.83	08	Mixed Use Zone	2.43	1.22
07	Circulation Network	7.88	3.95	09	Circulation Network	32.68	16.41
08	Transport & Communication	0.33	0.17	10	Transportation Facilities	0.13	0.06
09	Community Service	1.61	0.81	11	Community Facilities	3.14	1.57
				12	Health Facilities	0.00	0.00
10	Recreational Facilities	0.37	0.18	13	Recreational Facilities	0.29	0.15
11	Agriculture	53.57	26.89	14	Agriculture Zone	0.00	0.00
12	Water Body	10.00	5.02	15	Water Body	9.79	4.91
13	Vacant Land	17.65	8.86	16	Open Space	0.97	0.49
14	Restricted	0.00	0.00	17	Restricted Area	0.00	0.00
15	Service Activity	2.57	1.29	18	Utility Services	1.23	0.62
16	Urban Green Space	0.71	0.36	19	Urban Deferred	0.00	0.00
17	Miscellaneous	0.00	0.00	20	Miscellaneous	1.24	0.62
Grand Total		199.22	100	Grand Total		199.22	100

14.7.3.2 Proposed Land Use Zoning

Urban Residential Zone

In existing land uses, both the urban residential and rural homestead has been considered as residential use as a whole. In Ward Action Plan, more than 130.36 acres of land has been earmarked for urban residential use which will occupy about 65.44% of the total land.

Education and Research Zone

At present, 7.88 acre of land is under educational use in Ward no. 05. A secondary school of 0.43 acres is proposed in this ward. Development and improvement of existing educational institution is proposed for this ward. It covers 1.93% of total proposed land of the Ward. Table 10.17 of Chapter 10, Part B of this report shows the details.

Governmental Services

About 1.11 acre of land for governmental uses has been proposed for this Ward.

Mixed Use Zone

Total 2.43 acres, which covers 1.22% of total land of Ward no. 05 will be used as mixed use area for the planning period 2031.

Circulation network

For any type of development, circulation network is important. To improve the functional efficiency of the Ward, more roads are proposed which will consume 32.68 acres of total area. For network improvement and widening of existing road, link road and new roads are proposed which will be done phase wise within 2031.

Community Facilities

Proposed land for community service will be increased from 3.14 acre to 1.57 acres.

Water Body

The plan suggests preserving most of the water bodies for two purposes, first, to serve as source of water, second to serve as water retention area during monsoon. The ponds with an area equal to or more than 0.15 acres will be preserved as the water retention ponds. The proposed retention area covers about 9.79 acres of land.

Map 14.9: Landuse Proposal for Kaliganj Paurashava (Ward No. 05)

14.7.3.3 Proposed Road Infrastructure Development

Total 10.94km road development proposal have been made in the Ward Action Plan for Ward no. 05. Length of the local road will be 6.28 km and width of these roads will be 20 ft wide covering 57.40% of total road network development proposal. Length of secondary road will be 0.45 km and RoW will be 40 ft. Total length of primary road will be 1.43km 60ft and 1.35 km of 80ft width. Detailed scenario of road network development proposal is given in Table 14.26 and 14.27.

Table 14.27: Summary of Road Network Proposal at Ward no. 05 of Kaliganj Paurashava

Width in Ft	Type of Road	Total		New Road		Road Widening	
		Length(km)	%	Length(km)	%	Length(km)	%
15	Walkway	1.23	11.23	1.23	60.39	0.00	0.00
20	Local/Access	6.28	57.40	0.81	39.61	5.48	61.47
30	Tertiary	0.19	1.75	0.00	0.00	0.19	2.15
40	Secondary	0.45	4.15	0.00	0.00	0.45	5.10
60	Primary	1.43	13.11	0.00	0.00	1.43	16.10
80	Primary	1.35	12.35	0.00	0.00	1.35	15.18
Total		10.94	100.00	2.03	100.00	8.91	100.00

Table 14.28: Road Proposal for Ward no. 05

Proposed Road Id	Proposed Road Type	Proposed ROW (Feet)	Proposed Status	Phasing	Length (M)
LR_N-31	Local/Access	20	New Construction	3rd Phase	94.30
LR_N-32	Local/Access	20	New Construction	3rd Phase	87.83
LR_N-33	Local/Access	20	New Construction	3rd Phase	235.66
LR_N-34	Local/Access	20	New Construction	3rd Phase	41.17
LR_N-35	Local/Access	20	New Construction	3rd Phase	64.81
LR_N-36	Local/Access	20	New Construction	3rd Phase	77.11
LR_N-37	Local/Access	20	New Construction	3rd Phase	67.93
LR_N-38	Local/Access	20	New Construction	3rd Phase	35.16
LR_N-39	Local/Access	20	New Construction	3rd Phase	42.91
LR_N-40	Local/Access	20	New Construction	3rd Phase	58.99
LR_W-100	Local/Access	20	Widening	3rd Phase	153.10
LR_W-101	Local/Access	20	Widening	3rd Phase	37.76
LR_W-102	Local/Access	20	Widening	3rd Phase	82.76
LR_W-103	Local/Access	20	Widening	3rd Phase	290.56
LR_W-104	Local/Access	20	Widening	3rd Phase	92.30
LR_W-105	Local/Access	20	Widening	3rd Phase	41.62
LR_W-106	Local/Access	20	Widening	3rd Phase	149.94
LR_W-107	Local/Access	20	Widening	3rd Phase	231.03
LR_W-108	Local/Access	20	Widening	3rd Phase	47.05
LR_W-109	Local/Access	20	Widening	3rd Phase	116.34
LR_W-110	Local/Access	20	Widening	3rd Phase	143.66
LR_W-111	Local/Access	20	Widening	3rd Phase	114.06
LR_W-112	Local/Access	20	Widening	3rd Phase	175.36
LR_W-113	Local/Access	20	Widening	3rd Phase	336.83
LR_W-114	Local/Access	20	Widening	3rd Phase	63.46
LR_W-115	Local/Access	20	Widening	3rd Phase	83.98
LR_W-116	Local/Access	20	Widening	3rd Phase	105.64
LR_W-117	Local/Access	20	Widening	3rd Phase	183.04
LR_W-118	Local/Access	20	Widening	3rd Phase	146.85
LR_W-119	Local/Access	20	Widening	3rd Phase	151.36
LR_W-120	Local/Access	20	Widening	3rd Phase	63.22
LR_W-121	Local/Access	20	Widening	3rd Phase	173.92
LR_W-122	Local/Access	20	Widening	3rd Phase	143.18
LR_W-123	Local/Access	20	Widening	3rd Phase	200.94

Proposed Road Id	Proposed Road Type	Proposed ROW (Feet)	Proposed Status	Phasing	Length (M)
LR_W-124	Local/Access	20	Widening	3rd Phase	383.00
LR_W-125	Local/Access	20	Widening	3rd Phase	98.06
LR_W-126	Local/Access	20	Widening	3rd Phase	263.78
LR_W-93	Local/Access	20	Widening	3rd Phase	61.62
LR_W-94	Local/Access	20	Widening	3rd Phase	186.13
LR_W-95	Local/Access	20	Widening	3rd Phase	57.14
LR_W-96	Local/Access	20	Widening	3rd Phase	145.77
LR_W-97	Local/Access	20	Widening	3rd Phase	672.15
LR_W-98	Local/Access	20	Widening	3rd Phase	131.75
LR_W-99	Local/Access	20	Widening	3rd Phase	149.41
PR_W-31	Primary	80	Widening	1st Phase	1074.70
PR_W-32	Primary	60	Widening	1st Phase	1456.11
PR_W-34	Primary	80	Widening	1st Phase	277.39
SR_W-21	Secondary	40	Widening	2nd Phase	141.87
SR_W-22	Secondary	40	Widening	2nd Phase	312.84
TR_W-10	Tertiary	30	Widening	2nd Phase	191.43
WW_N-26	Walkway	15	New Construction	2nd Phase	365.90
WW_N-27	Walkway	15	New Construction	2nd Phase	418.93
WW_N-28	Walkway	15	New Construction	2nd Phase	136.26
WW_N-29	Walkway	15	New Construction	2nd Phase	14.91
WW_N-30	Walkway	15	New Construction	2nd Phase	147.77
WW_N-31	Walkway	15	New Construction	2nd Phase	135.95
WW_N-32	Walkway	15	New Construction	2nd Phase	6.88

14.7.3.4 Drainage Development Plan

The proposed drainage facilities will be developed based on this natural channel. There is proposal for 7.75 km of Secondary drain which will connect 13.27 km tertiary drain. Table 14.38 shows the details.

Table 14.29: Proposed Drainage Development Plan Proposals

Proposed Drain ID	Proposed Drain Type	Proposed Width (M)	Proposed Status	Phasing	Length (KM)
SD-14	Secondary	1.50	New Construction	First Phase	5.39
SD-15	Secondary	1.50	New Construction	Second Phase	0.08
SD-16	Secondary	1.50	New Construction	Third Phase	0.00
SD-17	Secondary	1.50	Widening	First Phase	2.27
SD-18	Secondary	1.50	Widening	Second Phase	0.01
TD-13	Tertiary	1.00	New Construction	First Phase	12.45
TD-14	Tertiary	1.00	New Construction	Second Phase	0.07
TD-15	Tertiary	1.00	New Construction	Third Phase	0.00
TD-16	Tertiary	1.00	Widening	First Phase	0.75
Ward No. 05 Total					21.02

14.7.3.5 Urban Services

A surface water treatment plant of 1.21 acre and Waste Transfer Center of 0.02 acre of land are proposed for Ward no. 05

Table 14.30: Urban Development Proposals of Ward 05

Development Proposal Type	Development Proposal Name	Proposal ID	Phasing	Mouza Name_JL No._Sheet No.	Plot No.	Area (Acres)
Commercial Zone	Neighborhood Market	NM-08	2nd Phase	Nischintapur_36_02	373, 375	0.61
	Paurashava Market	PM-01	1st Phase	Nischintapur_36_01	133, 135, 136, 137,	0.87

Development Proposal Type	Development Proposal Name	Proposal ID	Phasing	Mouza Name_JL No._Sheet No.	Plot No.	Area (Acres)
					140, 141, 144	
Community Facilities	Community center	CC-01	1st Phase	Nischintapur_36_01	179, 180	0.98
Education & Research Zone	Secondary School	SS-02	1st Phase	Nischintapur_36_01	147, 148, 149, 1226	0.43
Mixed Use Zone	Ward Councilor's office	WC-05	1st Phase	Nischintapur_36_01	294	0.49
				Nischintapur_36_02	335	0.01
Open Space	Park	P-07	1st Phase	Foila_29_00	99999	0.04
	Playground	PG-03	1st Phase	Nischintapur_36_01	137, 141, 142, 1224, 1225, 1226	0.79
Utility Services	Surface water Treatment	WTP-02	1st Phase	Nischintapur_36_01	202, 206	1.20
	Waste Transfer Center	WTC-04	1st Phase	Nischintapur_36_02	344	0.02
Ward No. 05 Total						5.44

Water Supply and sanitation

There is no proposal for water treatment plant and water supply system in this Ward. The Paurashava must try to promote hygienic sanitation to ensure better public health for the entire Paurashava.

**Map 14.10: Proposed Road, Drainage and Utility Services Plan for Kaliganj Paurashava
(Ward No. 05)**

14.8 Ward Action Plan for Ward No. 06

14.8.1 Demography

Ward No. 6 is the most densely populated ward in Kaliganj Paurashava. In 2011, the Ward had a population of 2763 persons. Population projection shows that 4617 people will be living in the year 2031 with a density of 16 persons per acre only. Table 14.29 shows details.

Table 14.31: Population Statistics of Ward No. 06

Item	Year	
	2011	2031
Area (acre)	552.55	552.55
Population	2763	4617
Density of Population (per acre)	10	16

14.8.2 Critical Issues and Opportunities of the Ward

Critical Issues

Narrow roads, traffic congestion, lack of drainage facilities, absent of water supply network, unplanned and haphazard development are main features of this Ward. The total length of roads in the Ward is not enough of normal movement. This length of roads will not be able to serve the entire area in future when settlements will increase. New road spaces being created on community efforts are usually very narrow.

The higher the size of population, the more demand is created for goods and services leading to more economic activities and employment. No urban centre can flourish without adequate economic prosperity.

Development Opportunities

As Kaliganj is a small town with less diversified activities the opportunities for future development are almost similar for the entire Paurashava.

14.8.3 Ward Action Plan Proposals

14.8.3.1 Review of Existing Land Use

This Ward is rural in character. Out of total 282.90 acre of land i.e. about 51.03% is used as agricultural use. 40.88 acre residential is the next use, more than 14.45% are used in this purpose. Water bodies occupy more than 4.62% land of the ward.

Table 14.32: Existing and Proposed Land Uses of Ward No. 06

Sl. No.	Existing Land use	Area in Acres	%	Sl. No.	Proposed Land Use	Area in Acres	%
01	Residential	40.88	14.45	01	Urban Residential Zone	69.67	24.63
				02	Rural Settlement	0.00	0.00
02	Education & Research	9.78	3.46	03	Education & Research Zone	0.68	0.24
03	Governmental Services	0.37	0.13	04	Government Office	0.36	0.13
04	Commercial Activity	0.93	0.33	05	Commercial Zone	1.63	0.58
05	Manufacturing and Processing Activity	65.41	23.12	06	General Industrial Zone	109.29	38.63

Sl. No.	Existing Land use	Area in Acres	%	Sl. No.	Proposed Land Use	Area in Acres	%
06	Mixed Use	0.16	0.06	07	Heavy Industrial Zone	0.00	0.00
07	Circulation Network	9.78	3.46	08	Mixed Use Zone	0.44	0.16
08	Transport & Communication	0.00	0.00	09	Circulation Network	42.10	14.88
09	Community Service	0.35	0.13	10	Transportation Facilities	3.11	1.10
10	Recreational Facilities	0.00	0.00	11	Community Facilities	1.42	0.50
11	Agriculture	144.37	51.03	12	Health Facilities	0.65	0.23
12	Water Body	13.06	4.62	13	Recreational Facilities	0.00	0.00
13	Vacant Land	4.85	1.71	14	Agriculture Zone	41.13	14.54
14	Restricted	0.00	0.00	15	Water Body	12.00	4.24
15	Service Activity	0.30	0.11	16	Open Space	0.19	0.07
16	Urban Green Space	1.55	0.55	17	Restricted Area	0.00	0.00
17	Miscellaneous	0.00	0.00	18	Utility Services	0.17	0.06
	Grand Total	282.90	100	19	Urban Deferred	0.00	0.00
				20	Miscellaneous	0.07	0.02
				Grand Total	282.90	100	

14.7.3.2 Proposed Land Use Zoning

Urban Residential Area

In Ward Action Plan, more land is allocated for residential use. A quantity of 69.67 (24.63%) acres of land has been earmarked for urban residential use.

Education and Research Zone

Only 0.68 acre area covering 0.06% of total land of Kaliganj Paurashava will be used as education and research zone in Ward no. 06.

Mixed Use

Total 0.69 acres covering 0.24% total land of Ward no. 06 will be used for mixed use up to the planning period 2031.

Commercial Zone

It will comprise of only 1.63 acres (0.58%) of land. Some amount of future commercial use will be created within the residential zone.

Circulation network

To improve the efficiency of the Ward, more roads are proposed which will consume 42.10 acres of land and more than 14.88% of the total area. For network improvement, widening of existing road, link road and new roads are proposed which will be done phase wise within 2031.

Agricultural Zone

The agricultural land is proposed to be about 41.13 acres up to the planning period 2031.

Water Body

The plan suggests preserving most of the water bodies for two purposes, first, to serve as source of water, second to serve as water retention area during monsoon. The ponds with an area equal to or more than 0.15 acres will be preserved as the water retention ponds. The proposed retention area covers about 12.00 acres (4.24%) of land.

Map 14.11: Landuse Proposal for Kaliganj Paurashava (Ward No. 06)

14.8.3.3 Proposed Road Infrastructure Development

Total 9.41 km road development proposal has been proposed in the first Ward Action Plan for Ward no. 06 of Kaliganj Paurashava. 4.34 km local road with 20 ft width has been proposed for this ward.

Table 14.33: Summary of Road Network Proposal at Ward no. 06 of Kaliganj Paurashava

Width in Ft	Type of Road	Total		New Road		Road Widening	
		Length(km)	%	Length(km)	%	Length(km)	%
15	Walkway	0.57	6.08	0.57	31.78	0.00	0.00
20	Local/Access	4.34	46.09	0.20	10.86	4.14	54.43
30	Tertiary	0.68	7.23	0.28	15.30	0.40	5.32
40	Secondary	0.94	10.04	0.00	0.00	0.94	12.41
60	Primary	0.56	5.93	0.00	0.00	0.56	7.33
120	Regional	1.47	15.57	0.76	42.06	0.71	9.30
150	National	0.85	9.06	0.00	0.00	0.85	11.21
Total		9.41	100.00	1.80	100.00	7.61	100.00

Table 14.34: Road Proposal for Ward no. 06

Proposed Road Id	Proposed Road Type	Proposed ROW (Feet)	Proposed Status	Phasing	Length (M)
LR_N-41	Local/Access	20	New Construction	3rd Phase	56.93
LR_N-42	Local/Access	20	New Construction	3rd Phase	70.34
LR_N-43	Local/Access	20	New Construction	3rd Phase	24.78
LR_N-44	Local/Access	20	New Construction	3rd Phase	43.46
LR_W-127	Local/Access	20	Widening	3rd Phase	117.40
LR_W-128	Local/Access	20	Widening	3rd Phase	95.76
LR_W-129	Local/Access	20	Widening	3rd Phase	668.10
LR_W-130	Local/Access	20	Widening	3rd Phase	708.86
LR_W-131	Local/Access	20	Widening	3rd Phase	241.60
LR_W-132	Local/Access	20	Widening	3rd Phase	77.17
LR_W-133	Local/Access	20	Widening	3rd Phase	75.28
LR_W-134	Local/Access	20	Widening	3rd Phase	902.56
LR_W-135	Local/Access	20	Widening	3rd Phase	287.56
LR_W-136	Local/Access	20	Widening	3rd Phase	92.52
LR_W-137	Local/Access	20	Widening	3rd Phase	106.61
LR_W-138	Local/Access	20	Widening	3rd Phase	75.52
LR_W-139	Local/Access	20	Widening	3rd Phase	83.75
LR_W-140	Local/Access	20	Widening	3rd Phase	25.96
LR_W-141	Local/Access	20	Widening	3rd Phase	115.67
LR_W-142	Local/Access	20	Widening	3rd Phase	212.73
LR_W-143	Local/Access	20	Widening	3rd Phase	183.38
LR_W-144	Local/Access	20	Widening	3rd Phase	69.97
PR_N-05	Regional	120	New Construction	1st Phase	757.45
PR_W-35	Regional	120	Widening	1st Phase	482.72
PR_W-36	Regional	120	Widening	1st Phase	224.99
PR_W-37	Primary	60	Widening	1st Phase	433.94
PR_W-38	Primary	60	Widening	1st Phase	141.52
PR_W-39	National	150	Widening	1st Phase	852.45
SR_W-23	Secondary	40	Widening	2nd Phase	103.53
SR_W-24	Secondary	40	Widening	2nd Phase	690.51
SR_W-25	Secondary	40	Widening	2nd Phase	150.39
TR_N-01	Tertiary	30	New Construction	2nd Phase	275.64
TR_W-11	Tertiary	30	Widening	2nd Phase	404.76
WW_N-33	Walkway	15	New Construction	2nd Phase	286.51
WW_N-34	Walkway	15	New Construction	2nd Phase	168.68
WW_N-35	Walkway	15	New Construction	2nd Phase	18.52
WW_N-36	Walkway	15	New Construction	2nd Phase	98.42

14.8.3.4 Drainage Development Plan

There is a few man-made drainage facilities in Ward no. 06 of Kaliganj Paurashava. Total 6.60 km of secondary drain will be served for Ward number 06, which will be connected by 7.83 km tertiary drain. Table 14.33 shows the details.

Table 14.35: Proposed Drainage Development Plan Proposals

Proposed Drain ID	Proposed Drain Type	Proposed Width (M)	Proposed Status	Phasing	Length (KM)
SD-19	Secondary	1.50	New Construction	First Phase	5.23
SD-20	Secondary	1.50	New Construction	Second Phase	0.00
SD-21	Secondary	1.50	Widening	First Phase	1.37
TD-17	Tertiary	1.00	New Construction	First Phase	7.83
Ward No. 06 Total					14.43

14.8.3.5 Urban Services

a. Solid Waste Management

Solid waste management is a major urban service. As density of population increases, the volume of solid waste also increases proportionately. However, the income level is also a major factor influencing the volume of solid waste. Population and the volume of waste in the Paurashava are yet to be large enough to become a problem for the city. But the present management system is not satisfactory and it might to lead to problem in future. It is recommended that home collection system is introduced in the Ward by creation of local CBOs. This will cause organized collection of waste and prevent indiscriminate littering.

Table 14.36: Urban Development Proposals of Ward 06

Development Proposal Type	Development Proposal Name	Proposal ID	Phasing	Mouza Name_JL No._Sheet No.	Plot No.	Area (Acres)
General Industrial Zone	General Industry	GI-01	3rd Phase	Nischintapur_36_02	757-761, 1033-1036, 1040, 1042-1050, 1052	7.21
		GI-02	2nd Phase	Nischintapur_36_02	1039-1041, 1050-1059, 1103, 1105, 1107-1120, 1123, 1124, 1126, 1130, 1131, 1133-1136, 1181, 1183-1190, 1609, 1610, 1611	15.37
Health Facilities	Maternity Clinic	MC-04	3rd Phase	Nischintapur_36_02	432, 440, 446-448, 504	0.65
Mixed Use Zone	Ward Councilor's office	WC-06	1st Phase	Nischintapur_36_02	614	0.44
Open Space	Neghborhood park	NP-01	2nd Phase	Nischintapur_36_02	1222	0.09
Transportation Facilities	Tempo Stand	TS-05	3rd Phase	Nischintapur_36_02	521, 1238	0.07
	Truck Terminal	TT-01	2nd Phase	Nischintapur_36_02	1191, 1193, 1198, 1199, 1201-1204	2.89
Utility Services	Slaughter House	SH-02	2nd Phase	Nischintapur_36_02	588	0.15
	Waste Transfer Center	WTC-05	1st Phase	Nischintapur_36_02	541	0.02
Ward No. 06 Total						26.89

b. Water Supply

It is proposed to install a network based water supply system by exploring fresh water from the Chitra River. Two water treatment plants will be established on the bank of the Chitra River at Ward no. 01 and 05 and water supply lines in this Ward will be established along all categories of roads as per the growth of the settlement from this water treatment plant.

c. Sanitation

The Paurashava must try to promote hygienic sanitation to ensure better public health for the entire Paurashava. There is hardly any public toilet in the town to serve the visitors and the local people.

**Map 14.12: Proposed Road, Drainage and Utility Services Plan for Kaliganj Paurashava
(Ward No. 06)**

14.9 Ward Action Plan for Ward no. 07

14.9.1 Demography

Ward no. 07 is located on the middle-northern part of the River Chitra. In 2011, the Ward had a population of 6106 persons. Population projection shows that 10202 people will be living in the Ward in the year 2031. The density of population will be 37 persons per acre. Table 14.34 shows the details.

Table 14.37: Population Statistics of Ward no. 07

Item	Year	
	2011	2031
Area (acre)	274.20	274.20
Population	6106	10202
Density of Population (per acre)	22	37

14.9.2 Critical Issues and Opportunities of the Ward

Critical Issues

Although this Ward is located in the central area in the context of the Paurashava town, most of the areas have agricultural characteristics. There are also commercial establishments, mixed use and residential settlements. However, it has lack of basic facilities and infrastructure required for an urban area. The Ward is not adequately served by roads. None of access roads of this ward is above 10 ft wide except the RHD road passing through the heart of the Ward. Quality of roads on average is not satisfactory.

Ward no. 07 is located just upper side of Ward no 05, the most important commercial area with better infrastructural facilities. The Ward, however, has the rural characteristics. Thus the Ward has greater potentialities to grow as an important and livable urban area by building up various community and infrastructural facilities and amenities. This could serve the entire Ward and surrounding area.

Development Opportunities

As Kaliganj is a small town with less diversified activities, the opportunities for future development are almost similar for the entire Paurashava.

Table 14.38: Comparative Existing Land Use and Proposed Land Use of Ward No. 07

Sl. No.	Existing Land use	Area in Acres	%	Sl. No.	Proposed Land Use	Area in Acres	%
01	Residential	93.28	34.02	01	Urban Residential Zone	133.59	48.72
				02	Rural Settlement	0.00	0.00
02	Education & Research	9.74	3.55	03	Education & Research Zone	3.35	1.22
03	Governmental Services	0.14	0.05	04	Government Office	0.13	0.05
04	Commercial Activity	9.89	3.61	05	Commercial Zone	5.26	1.92
05	Manufacturing and Processing Activity	0.91	0.33	06	General Industrial Zone	0.00	0.00
				07	Heavy Industrial Zone	0.00	0.00
06	Mixed Use	3.48	1.27	08	Mixed Use Zone	14.78	5.39
07	Circulation Network	9.74	3.55	09	Circulation Network	37.62	13.72
08	Transport & Communication	0.31	0.11	10	Transportation Facilities	0.02	0.01
09	Community Service	0.99	0.36	11	Community Facilities	1.61	0.59
				12	Health Facilities	0.89	0.33

Sl. No.	Existing Land use	Area in Acres	%	Sl. No.	Proposed Land Use	Area in Acres	%
10	Recreational Facilities	0.00	0.00	13	Recreational Facilities	0.00	0.00
11	Agriculture	105.93	38.63	14	Agriculture Zone	0.00	0.00
12	Water Body	9.48	3.46	15	Water Body	9.37	3.42
13	Vacant Land	33.18	12.10	16	Open Space	0.06	0.02
14	Restricted	0.16	0.06	17	Restricted Area	0.16	0.06
15	Service Activity	1.51	0.55	18	Utility Services	0.00	0.00
16	Urban Green Space	0.93	0.34	19	Urban Deferred	67.10	24.47
17	Miscellaneous	0.00	0.00	20	Miscellaneous	0.25	0.09
Grand Total		274.20	100	Grand Total		274.20	100

14.9.3 Ward Action Plan Proposals

14.9.3.1 Review of Existing Land Use

Out of total 274.20 acres of land covering 38.63% of the Ward area is used for agriculture. The next use is residential; more than 93.28 acres of land are used for this purpose. Water bodies occupy about 3.46% land of the Ward. About 12.10% of total land is laid vacant, about 3.55% is used as circulation network, and only 0.99acre of land is used for community facilities. A negligible percentage of urban green space (0.34%) is available here.

14.9.3.2 Proposed Land Use Zoning

Urban Residential Area

In Ward Action Plan, more land is allocated for residential use. More than 133.59 acres of land has been earmarked for urban residential use, which occupies about 48.72% of the total land.

Education and Research Zone

All together 3.35 acres (1.22%) of land is proposed for educational purposes. Table 14.33 shows the details.

Governmental Services

Total 0.13 acre of land is proposed for administrative use which covers 0.05% of total land of Ward no. 07 in Kaliganj Paurashava.

Commercial Zone

Total 5.26 acres area which covers 1.92% of total land of Ward no. 07 will be used as commercial zone for Kaliganj Paurashava. A ward market is proposed to establish in this ward.

Mixed Use

More than 5.39% of the total area of the Ward is allocated for mixed use zone. This mixed use land will be used for commercial and community facilities. This land is located beside college road in Kaliganj Paurashava. One Ward Center will also be established within this mixed use zone.

Circulation network

For any type of development, circulation network is an important facility. To improve the efficiency of the Ward, more roads are proposed which will consume more than 37.62

acres of land and more than 13.72% of the total area. For network improvement, widening of existing road, link road and new roads are proposed which will be done phase wise within 2031.

Community Facilities

Total 1.61 acre area covering 0.59% of total land of this Ward will be used for community facilities. No additional land is proposed for this purpose in this Ward.

Mixed Use Zone

Total 14.78 acre area covering 5.39 % of total land of this Ward will be used for mixed use zone. No additional land is proposed for this purpose in this Ward.

Water Body

The plan suggests preserving most of the water bodies for two purposes, first, to serve as source of water, second to serve as water retention area during monsoon. The ponds with an area equal to or more than 0.15 acre will be preserved as the water retention ponds. The proposed retention area covers more than 9.37 acres of land.

Map 14.13: Landuse Proposal for Kaliganj Paurashava (Ward No. 07)

14.9.3.3 Proposed Road Infrastructure Development

Total 13.23 km road development proposal has been made in the first Ward Action Plan for Ward no. 07 of Kaliganj Paurashava. Length of the local road will be 7.06 km and width of these roads will be 20 ft and it covers 53.33% of total road network development proposal. Total length of secondary road will be 2.55 km with width of 40 ft and primary road with 150 ft width will be 1.50km. Detailed scenario of road network development proposal is given in Table 14.38 and 14.37.

Table 14.39: Summary of Road Network Proposal at Ward no. 07 of Kaliganj Paurashava

Width in Ft	Type of Road	Total		New Road		Road Widening	
		Length(km)	%	Length(km)	%	Length(km)	%
20	Local/Access	7.06	53.33	2.14	100.00	4.91	44.32
30	Tertiary	1.40	10.61	0.00	0.00	1.40	12.66
40	Secondary	2.55	19.29	0.00	0.00	2.55	23.02
80	Primary	0.72	5.46	0.00	0.00	0.72	6.52
150	National	1.50	11.30	0.00	0.00	1.50	13.49
Total		13.23	100.00	2.14	100.00	11.09	100.00

Table 14.40: Road Proposal for Ward no. 07

Proposed Road Id	Proposed Road Type	Proposed ROW (Feet)	Proposed Status	Phasing	Length (M)
LR_N-45	Local/Access	20	New Construction	3rd Phase	310.68
LR_N-46	Local/Access	20	New Construction	3rd Phase	505.62
LR_N-47	Local/Access	20	New Construction	3rd Phase	45.02
LR_N-48	Local/Access	20	New Construction	3rd Phase	22.98
LR_N-49	Local/Access	20	New Construction	3rd Phase	50.97
LR_N-50	Local/Access	20	New Construction	3rd Phase	25.17
LR_N-51	Local/Access	20	New Construction	3rd Phase	33.02
LR_N-52	Local/Access	20	New Construction	3rd Phase	97.99
LR_N-53	Local/Access	20	New Construction	3rd Phase	272.97
LR_N-54	Local/Access	20	New Construction	3rd Phase	184.66
LR_N-55	Local/Access	20	New Construction	3rd Phase	259.53
LR_N-56	Local/Access	20	New Construction	3rd Phase	109.61
LR_N-57	Local/Access	20	New Construction	3rd Phase	69.94
LR_N-58	Local/Access	20	New Construction	3rd Phase	90.56
LR_N-59	Local/Access	20	New Construction	3rd Phase	62.95
LR_W-145	Local/Access	20	Widening	3rd Phase	94.81
LR_W-146	Local/Access	20	Widening	3rd Phase	159.26
LR_W-147	Local/Access	20	Widening	3rd Phase	257.51
LR_W-148	Local/Access	20	Widening	3rd Phase	11.98
LR_W-149	Local/Access	20	Widening	3rd Phase	166.90
LR_W-150	Local/Access	20	Widening	3rd Phase	37.85
LR_W-151	Local/Access	20	Widening	3rd Phase	292.73
LR_W-152	Local/Access	20	Widening	3rd Phase	23.90
LR_W-153	Local/Access	20	Widening	3rd Phase	279.49
LR_W-154	Local/Access	20	Widening	3rd Phase	79.27
LR_W-155	Local/Access	20	Widening	3rd Phase	63.72
LR_W-156	Local/Access	20	Widening	3rd Phase	52.20
LR_W-157	Local/Access	20	Widening	3rd Phase	62.71
LR_W-158	Local/Access	20	Widening	3rd Phase	78.88
LR_W-159	Local/Access	20	Widening	3rd Phase	192.23
LR_W-160	Local/Access	20	Widening	3rd Phase	166.89
LR_W-161	Local/Access	20	Widening	3rd Phase	157.37
LR_W-162	Local/Access	20	Widening	3rd Phase	32.88
LR_W-163	Local/Access	20	Widening	3rd Phase	157.68
LR_W-164	Local/Access	20	Widening	3rd Phase	181.44
LR_W-165	Local/Access	20	Widening	3rd Phase	253.83
LR_W-166	Local/Access	20	Widening	3rd Phase	67.81

Proposed Road Id	Proposed Road Type	Proposed ROW (Feet)	Proposed Status	Phasing	Length (M)
LR_W-167	Local/Access	20	Widening	3rd Phase	177.03
LR_W-168	Local/Access	20	Widening	3rd Phase	55.86
LR_W-169	Local/Access	20	Widening	3rd Phase	100.69
LR_W-170	Local/Access	20	Widening	3rd Phase	53.37
LR_W-171	Local/Access	20	Widening	3rd Phase	170.31
LR_W-172	Local/Access	20	Widening	3rd Phase	109.82
LR_W-173	Local/Access	20	Widening	3rd Phase	66.11
LR_W-174	Local/Access	20	Widening	3rd Phase	211.54
LR_W-175	Local/Access	20	Widening	3rd Phase	102.64
LR_W-176	Local/Access	20	Widening	3rd Phase	103.44
LR_W-177	Local/Access	20	Widening	3rd Phase	241.06
LR_W-179	Local/Access	20	Widening	3rd Phase	172.57
LR_W-180	Local/Access	20	Widening	3rd Phase	76.29
LR_W-181	Local/Access	20	Widening	3rd Phase	178.93
LR_W-182	Local/Access	20	Widening	3rd Phase	87.96
LR_W-183	Local/Access	20	Widening	3rd Phase	160.84
PR_W-43	Primary	80	Widening	1st Phase	722.97
PR_W-44	National	150	Widening	1st Phase	1495.46
SR_W-26	Secondary	40	Widening	2nd Phase	1015
SR_W-27	Secondary	40	Widening	2nd Phase	231.28
SR_W-28	Secondary	40	Widening	2nd Phase	404.07
SR_W-29	Secondary	40	Widening	2nd Phase	366.52
SR_W-30	Secondary	40	Widening	2nd Phase	520.91
TR_W-12	Tertiary	30	Widening	2nd Phase	465.77
TR_W-13	Tertiary	30	Widening	2nd Phase	220.80
TR_W-14	Tertiary	30	Widening	2nd Phase	251.95
TR_W-15	Tertiary	30	Widening	2nd Phase	221.93
TR_W-16	Tertiary	30	Widening	2nd Phase	243.06

14.9.3.4 Drainage Development Plan

The proposed drainage facilities will be developed based on this river. Here proposed 9.97 km of secondary drain and the river will serve as primary drains for Ward no. 07 which will be connected by 16.06 km tertiary drain. Table 14.38 shows the details.

Table 14.41: Proposed Drainage Development Plan Proposals

Proposed Drain ID	Proposed Drain Type	Proposed Width (M)	Proposed Status	Phasing	Length (KM)
SD-22	Secondary	1.50	New Construction	First Phase	7.16
SD-23	Secondary	1.50	New Construction	Second Phase	0.10
SD-24	Secondary	1.50	Widening	First Phase	2.71
SD-25	Secondary	1.50	Widening	Second Phase	0.00
TD-18	Tertiary	1.00	New Construction	First Phase	15.43
TD-19	Tertiary	1.00	New Construction	Second Phase	0.31
TD-20	Tertiary	1.00	Widening	First Phase	0.32
Ward No. 07 Total					26.02

14.9.3.5 Urban Services

a. Solid Waste Management

Solid waste management is a major urban service. As density of population increases, the volume of solid waste also increases proportionately. However, the income level is also a major factor influencing the volume of solid waste. Population and the volume of waste in the Paurashava are yet to be large enough to become a problem for the city. But the present management system is not satisfactory and it might lead to problem in future. The consultant has not proposed any solid waste transfer station or disposable site in this area. It is recommended that home collection system is introduced in the Ward by creation of

local CBOs. This will cause organized collection of waste and prevent indiscriminate littering.

b. Water Supply

It is proposed to install a network based water supply system by exploring fresh water from the Chitra River. Two water treatment plants will be established on the bank of the Chitra River at Ward no. 01 and 05 and water supply lines in this Ward will be established along all categories of roads as per the growth of the settlement from this water treatment plant.

c. Sanitation

The Paurashava must try to promote hygienic sanitation to ensure better public health for the entire Paurashava.

Table 14. 42: Urban Development Proposals of Ward 07

Development Proposal Type	Development Proposal Name	Proposal ID	Phasing	Mouza Name_JL No._Sheet No.	Plot No.	Area (Acres)
Commercial Zone	Neighborhood Market	NM-09	1st Phase	Arpara_28_00	240-242, 473	0.19
Health Facilities	Eye Hospital	EH-01	1st Phase	Arpara_28_00	138, 145	0.89
Mixed Use Zone	Ward Councilor's office	WC-07	1st Phase	Arpara_28_00	152	0.43
Open Space	Park	P-01	1st Phase	Kaligonj_17_02	1097	0.06
Ward No. 07 Total						1.58

**Map 14.14: Proposed Road, Drainage and Utility Services Plan for Kaliganj Paurashava
(Ward No. 07)**

14.10 Ward Action Plan for Ward No.8

14.10.1 Demography

Ward No. 8 is located on the southern part of the town. It has a low density of population. In 2011, the Ward had a population of 3640 persons. Population projection shows that 6082 people will be living in this Ward in the year 2031 with a density of 6 persons per acre. Table 14.40 shows the details.

Table 14.43: Population Statistics of Ward No. 08

Item	Year	
	2011	2031
Area (acre)	1697.14	1697.14
Population	3640	6082
Density of Population (per acre)	4	6

14.10.2 Critical Issues and Opportunities of the Ward

Critical Issues

Ward No.08 is located on the southern side of Paurashava. Most of the area is now in agricultural practice. There is acute shortage of basic infrastructure and facilities necessary for a livable urban environment. The length of roads will not be able to serve the entire area in future when settlements will increase. None of these roads is above 10 ft wide.

Development Opportunities

As Kaliganj is a small town with less diversified activities, the opportunities for future development are almost similar for the entire Paurashava. Internal connectivity of road is a positive point for development.

14.10.3 Ward Action Plan Proposals

14.10.3.1 Review of Existing Land Use

Ward no. 08 is mainly rural in character. Out of total 951.37 acres of land of this Ward, more than 833.13 acres of land i.e. 87.57% is used as agriculture. The next use is residential having; 75.17 acres for the purpose. It occupies almost 7.90% of total land. An amount of 0.70 acre of land is under commercial use. Among other uses, water bodies occupy 2.56% land, while 12.64 acre is used for education and 1.33% is used for circulation network. Only 0.13% of land is used for community facilities and 0.26 acres of land is used for urban green space. No other type of land uses are found in this Ward, not even any recreational facility is present in this Ward. Table 14.41 shows the details.

14.10.3.2 Proposed Land Use Zoning

Urban Residential Zone

In Ward Action Plan, more than 61.27 acres of land remains for urban settlement occupying 6.44% of the total land.

Rural Settlement

In Ward Action Plan, more than 92.68 acres of land remains for rural settlement occupying 9.74% of the total land.

Education and Research Zone

Total 1.32 acre of land is proposed for education and research in Ward no. 08. Additionally 0.38 acre is allocated for a secondary school in this Ward.

Circulation network

For any type of development, circulation network is an important factor. The circulation network 38.88 acres which covers 4.09% of the total area. For network improvement, widening of existing road, link road and new roads are proposed which will be done phase wise within 2031.

Table 14. 44: Existing and Proposed Land Use of Ward no. 08

Sl. No.	Existing Land use	Area in Acres	%	Sl. No.	Proposed Land Use	Area in Acres	%
01	Residential	75.17	7.90	01	Urban Residential Zone	61.27	6.44
				02	Rural Settlement	92.68	9.74
02	Education & Research	12.64	1.33	03	Education & Research Zone	1.32	0.14
03	Governmental Services	0.31	0.03	04	Government Office	0.28	0.03
04	Commercial Activity	0.70	0.07	05	Commercial Zone	1.69	0.18
05	Manufacturing and Processing Activity	0.49	0.05	06	General Industrial Zone	0.44	0.05
				07	Heavy Industrial Zone	0.00	0.00
06	Mixed Use	0.00	0.00	08	Mixed Use Zone	1.94	0.20
07	Circulation Network	12.64	1.33	09	Circulation Network	38.88	4.09
08	Transport & Communication	0.43	0.04	10	Transportation Facilities	0.18	0.02
09	Community Service	1.25	0.13	11	Community Facilities	1.43	0.15
				12	Health Facilities	1.42	0.15
10	Recreational Facilities	0.00	0.00	13	Recreational Facilities	0.00	0.00
11	Agriculture	833.13	87.57	14	Agriculture Zone	725.63	76.27
12	Water Body	24.34	2.56	15	Water Body	23.66	2.49
13	Vacant Land	0.93	0.10	16	Open Space	0.54	0.06
14	Restricted	0.00	0.00	17	Restricted Area	0.00	0.00
15	Service Activity	0.04	0.00	18	Utility Services	0.01	0.00
16	Urban Green Space	0.26	0.03	19	Urban Deferred	0.00	0.00
17	Miscellaneous	0.00	0.00	20	Miscellaneous	0.00	0.00
Grand Total		951.37	100	Grand Total		951.37	100

Health Services

There is no hospital or clinic in this Ward. Total 1.42 acre of land is proposed for health services. A maternity clinic will be established in this area.

Community Facilities

Proposed land for community service will be increased from 1.25 acre to 1.43 acres due to road widening and construction of new roads for smooth functioning of traffic circulation.

Agricultural Zone

There is 725.63 acres of agricultural land in this Ward. In the future, for infrastructure, housing and other facilities and services, agricultural land will be used. So it is proposed that 76.27% of total land of the Ward will remain in agricultural use up to the year 2031

Water Body

The plan suggests preserving most of the water bodies for two purposes, first, to serve as source of water, second to serve as water retention area during monsoon. The ponds with an area equal to or more than 0.15 acres will be preserved as the water retention ponds. The proposed retention area covers about 23.66 acres of land.

Open Space

Proposed land for urban open space is 0.54 acres. Among these, 0.53 acre of a playground has been proposed.

Map 14.15: Landuse Proposal for Kaliganj Paurashava (Ward No. 08)

14.10.3.3 Proposed Road Infrastructure Development

Total 11.42 km road development proposal has been proposed for Ward no. 08 of Kaliganj Paurashava. Length of the local road is 3.74 km with width of 20 ft covering 32.76% of total road network development proposal. Total length of secondary road will be 7.18 km and width of these roads will be varied from 40 ft. Length of secondary road will be 0.19 km with 80 ft width. Detailed scenario of road network development proposal is given in Table 14.42 and table 14.43.

Table 14.45: Summary of Road Network Proposal at Ward no. 08 of Kaliganj Paurashava

Width in Ft	Type of Road	Total		New Road		Road Widening	
		Length(km)	%	Length(km)	%	Length(km)	%
20	Local/Access	3.74	32.76	0.51	100.00	3.24	29.64
30	Tertiary	0.32	2.77	0.00	0.00	0.32	2.90
40	Secondary	7.18	62.83	0.00	0.00	7.18	65.74
80	Primary	0.19	1.64	0.00	0.00	0.19	1.72
Total		11.42	100.00	0.51	100.00	10.92	100.00

Table 14.46: Road Proposal for ward no. 08

Proposed Road Id	Proposed Road Type	Proposed ROW (Feet)	Proposed Status	Phasing	Length (M)
LR_N-60	Local/Access	20	New Construction	3rd Phase	105.86
LR_N-61	Local/Access	20	New Construction	3rd Phase	43.09
LR_N-62	Local/Access	20	New Construction	3rd Phase	179.59
LR_N-63	Local/Access	20	New Construction	3rd Phase	67.84
LR_N-64	Local/Access	20	New Construction	3rd Phase	110.25
LR_W-184	Local/Access	20	Widening	3rd Phase	243.95
LR_W-185	Local/Access	20	Widening	3rd Phase	362.28
LR_W-186	Local/Access	20	Widening	3rd Phase	261.40
LR_W-187	Local/Access	20	Widening	3rd Phase	251.31
LR_W-188	Local/Access	20	Widening	3rd Phase	116.60
LR_W-189	Local/Access	20	Widening	3rd Phase	150.88
LR_W-190	Local/Access	20	Widening	3rd Phase	130.49
LR_W-191	Local/Access	20	Widening	3rd Phase	160.62
LR_W-192	Local/Access	20	Widening	3rd Phase	547.48
LR_W-193	Local/Access	20	Widening	3rd Phase	190.23
LR_W-194	Local/Access	20	Widening	3rd Phase	518.98
LR_W-196	Local/Access	20	Widening	3rd Phase	29.17
LR_W-197	Local/Access	20	Widening	3rd Phase	36.83
LR_W-198	Local/Access	20	Widening	3rd Phase	236.22
PR_W-45	Primary	80	Widening	1st Phase	187.42
SR_W-31	Secondary	40	Widening	2nd Phase	88.35
SR_W-32	Secondary	40	Widening	2nd Phase	1975.71
SR_W-33	Secondary	40	Widening	2nd Phase	1311.19
SR_W-34	Secondary	40	Widening	2nd Phase	790.82
SR_W-35	Secondary	40	Widening	2nd Phase	463.30
SR_W-36	Secondary	40	Widening	2nd Phase	678.70
SR_W-37	Secondary	40	Widening	2nd Phase	726.86
SR_W-38	Secondary	40	Widening	2nd Phase	1142.50
TR_W-17	Tertiary	30	Widening	2nd Phase	316.34

14.10.3.4 Drainage Development Plan

There is no man-made drainage facility at Ward no. 08 of Kaliganj Paurashava. The proposed drainage facilities will 3.47 km secondary drain and 6.51 km tertiary drain. Table 14.44 shows the details.

Table 14.47: Proposed Drainage Development Plan Proposals

Proposed Drain ID	Proposed Drain Type	Proposed Width (M)	Proposed Status	Phasing	Length (KM)
SD-26	Secondary	1.50	New Construction	First Phase	0.01
SD-27	Secondary	1.50	New Construction	Third Phase	3.46
TD-21	Tertiary	1.00	New Construction	First Phase	0.01
TD-22	Tertiary	1.00	New Construction	Third Phase	6.50
Ward No. 08 Total					9.98

14.10.3.5 Urban Services

The present solid waste management system is not satisfactory and it might to lead to problem in future. The consultant does not propose any solid waste disposable and transfer station in this Ward. There is also no initiative for water supply and sanitation system. There is also no new proposal for solid waste management, water supply and sanitation system and also other urban utility facilities in this Ward.

Table 14.48: Urban Development Proposals of Ward 08

Development Proposal Type	Development Proposal Name	Proposal ID	Phasing	Mouza Name_JL No._Sheet No.	Plot No.	Area (Acres)
Commercial Zone	Neighborhood Market	NM-10	3rd Phase	Babra_70_01	420	0.0003
				Babra_70_02	1101, 1105	0.29
Education & Research Zone	Secondary School	SS-03	3rd Phase	Babra_70_02	1125	0.38
Health Facilities	Maternity Clinic	MC-05	3rd Phase	Babra_70_01	456, 535, 539, 541, 542, 558-561, 565	1.42
Mixed Use Zone	Ward Councilor's office	WC-08	1st Phase	Babra_70_01	576, 578, 579	1.94
Open Space	Playground	PG-04	3rd Phase	Babra_70_01	428, 558, 586-588	0.53
Utility Services	Waste Transfer Center	WTC-06	1st Phase	Nischintapur_36_03	1291	0.01
Ward No. 08 Total						4.57

**Map 14.16: Proposed Road, Drainage and Utility Services Plan for Kaliganj Paurashava
(Ward No. 08)**

14.11 Ward Action Plan for Ward no.9

14.11.1 Demography

Ward no. 9 is located on the western part of the town. In 2011 the Ward had a population of 5103 persons. For the same year, it has a density of about 13 persons per acre. The estimated population for the year 2031 will be 8527 with a density of 22 ppa.

Table 14.49: Population Statistics of Ward No. 09

Item	Year	
	2011	2031
Area (acre)	867.39	867.39
Population	5103	8527
Density of Population (per acre)	13	22

14.11.2 Critical Issues and Opportunities of the Ward

Critical Issues

Most of the area of the Ward is now under agricultural practices. There is acute shortage of basic infrastructure and facilities necessary for a livable urban environment. Infrastructure development is not cost effective for its low density of population. This size of population will not help grow the local economy. Like all other wards, water supply is also a critical problem in this Ward.

The Ward is not served by adequate number of roads. The total length of roads in the Ward is very few.

Development Opportunities

As Kaliganj is a small town with less diversified activities, the opportunities for future development are almost similar for the entire Paurashava.

14.11.3 Ward Action Plan Proposals

14.11.3.1 Review of Existing Land Use

Ward no. 09 is mainly rural and peripheral area in character. Out of total 384.66 acres of land of this Ward, 253.93 acres of land is under agricultural use. The residential use has 61.74 acres of land covering about 16.05% of total land. Among other uses, 14.12acre is industrial, 3.78acres vacant, 6% water body, and 7.13 acre educational and about 7.13 acre is used for circulation network. Only 3.25 acre of land is used for commercial purposes and 0.84% of land is used for Community facilities. Only 1.09 acres of land is used as urban green space.

14.11.3.2 Proposed Land Use Zoning

Residential Area

In the land use proposal, the urban residential use possesses 99.82 acres of land which covers 25.95% total land of Ward no. 09 in Kaliganj Paurashava.

Rural Settlement

As half of the land of the Ward is in agricultural use, so in Ward Action Plan, almost 8.83% (33.98 acre) is proposed for rural homestead up to the year 2031.

Table 14.50: Comparative Existing Land Use and Proposed Land Use of Ward no. 09

Sl. No.	Existing Land use	Area in Acres	%	Sl. No.	Proposed Land Use	Area in Acres	%
01	Residential	61.74	16.05	01	Urban Residential Zone	99.82	25.95
				02	Rural Settlement	33.98	8.83
02	Education & Research	7.13	1.85	03	Education & Research Zone	2.94	0.76
03	Governmental Services	5.19	1.35	04	Government Office	5.68	1.48
04	Commercial Activity	3.25	0.84	05	Commercial Zone	7.07	1.84
05	Manufacturing and Processing Activity	14.12	3.67	06	General Industrial Zone	1.58	0.41
				07	Heavy Industrial Zone	0.03	0.01
06	Mixed Use	0.71	0.18	08	Mixed Use Zone	0.96	0.25
07	Circulation Network	7.13	1.85	09	Circulation Network	40.69	10.58
08	Transport & Communication	0.83	0.21	10	Transportation Facilities	0.76	0.20
09	Community Service	0.38	0.10	11	Community Facilities	1.77	0.46
				12	Health Facilities	0.49	0.13
10	Recreational Facilities	0.00	0.00	13	Recreational Facilities	0.00	0.00
11	Agriculture	253.93	66.01	14	Agriculture Zone	127.98	33.27
12	Water Body	31.93	8.30	15	Water Body	29.40	7.64
13	Vacant Land	3.78	0.98	16	Open Space	10.44	2.71
14	Restricted	0.00	0.00	17	Restricted Area	0.00	0.00
15	Service Activity	0.25	0.06	18	Utility Services	0.07	0.02
16	Urban Green Space	1.09	0.28	19	Urban Deferred	21.00	5.46
17	Miscellaneous	0.00	0.00	20	Miscellaneous	0.00	0.00
Grand Total		384.66	100	Grand Total		384.66	100

Education and Research Zone

All together 2.94 acres of land is proposed for education and research purposes for this Ward. Moreover, a high school and one primary have been additionally proposed.

Commercial Zone

Total 1.84% is proposed for commercial zone in this Ward. Additional 0.22 acre of land is proposed for a local market in the fringe area and about 4.63 acre for Gorur Hat (Cow Hat).

Mixed Use Zone

Additional proposal of 0.96 acre of land falls under mixed use zone. A Neighborhood Center will be established in peripheral area.

Circulation network

For any type of development, circulation network is very important. To improve the efficiency of the Ward activities, more roads are proposed which will consume almost 40.69 acres of land and it is more than 10.58% of the total area of Ward no. 09 in Kaliganj Paurashava. For network improvement, widening of existing road, link road and new roads are proposed which will be done phase wise within 2031.

Map 14.17: Landuse Proposal for Kaliganj Paurashava (Ward No. 09)

Transportation Facilities

Only 0.76 acre of land is proposed for transport and communication. This land will be used for developing bus stand and a Para-transit stand.

Community Facilities

Total 1.77 acres of land will be used for community facilities. No Additional land will be used for this purpose.

Agricultural Zone

This ward has a vast area of agricultural land that demands formation of a separate zone like, agriculture zone. About 33.27% of the total land of the Ward will remain for agricultural use up to the year 2031. Some portion of land of rural homestead will also be utilized for agricultural activities as farm, poultry or horticulture. This zone will serve as the hinterland for the town.

Open Space

Total 10.44 acres of open land has been proposed for a Local Park and a playground for Ward no 09.

Water Body

The plan suggests preserving most of the water bodies for two purposes, first, to serve as source of water, second to serve as water retention area during monsoon. The ponds with an area equal to or more than 0.15 acres will be preserved as the water retention ponds. The proposed retention area covers 29.40 acres of land.

Urban deferred

Total 21.00 acres area will be used as urban deferred which covers 5.46% total land of Ward no. 09 in Kaliganj Paurashava.

14.11.3.3 Proposed Road Infrastructure Development

Total 12.98 km road development proposal has been proposed in the first Ward Action Plan for Ward no. 09 of Kaliganj Paurashava. Length of the local road will be 3.39 km with width of 20 ft covering 26.14% of total road network development proposal. Total length of secondary road will be 1.33 km and width of these roads will be 40ft .There is proposal for 1.36 km 120 ft primary road network. Detailed scenario of road network development proposal is given in Table 14.47.

Table 14.51: Summary of Road Network Proposal at Ward no. 09 of Kaliganj Paurashava

Width in Ft	Type of Road	Total		New Road		Road Widening	
		Length(km)	%	Length(km)	%	Length(km)	%
15	Walkway	4.66	35.91	4.66	79.70	0.00	0.00
20	Local/Access	3.39	26.14	0.86	14.75	2.53	35.48
30	Tertiary	0.82	6.35	0.00	0.00	0.82	11.56
40	Secondary	1.33	10.22	0.00	0.00	1.33	18.61
60	Primary	0.75	5.81	0.00	0.00	0.75	10.58
80	Primary	0.66	5.12	0.00	0.00	0.66	9.32
120	Regional	1.36	10.44	0.32	5.55	1.03	14.46
Total		12.98	100.00	5.85	100.00	7.13	100.00

Table 14.52: Road Proposal for Ward no. 09

Proposed Road Id	Proposed Road Type	Proposed ROW (Feet)	Proposed Status	Phasing	Length (M)
LR_N-65	Local/Access	20	New Construction	3rd Phase	64.37
LR_N-66	Local/Access	20	New Construction	3rd Phase	117.50
LR_N-67	Local/Access	20	New Construction	3rd Phase	137.10
LR_N-68	Local/Access	20	New Construction	3rd Phase	100.60
LR_N-69	Local/Access	20	New Construction	3rd Phase	82.50
LR_N-70	Local/Access	20	New Construction	3rd Phase	94.53
LR_N-71	Local/Access	20	New Construction	3rd Phase	80.15
LR_N-72	Local/Access	20	New Construction	3rd Phase	121.47
LR_N-73	Local/Access	20	New Construction	3rd Phase	64.67
LR_W-199	Local/Access	20	Widening	3rd Phase	352.99
LR_W-200	Local/Access	20	Widening	3rd Phase	88.34
LR_W-201	Local/Access	20	Widening	3rd Phase	153.89
LR_W-202	Local/Access	20	Widening	3rd Phase	35.85
LR_W-203	Local/Access	20	Widening	3rd Phase	261.71
LR_W-204	Local/Access	20	Widening	3rd Phase	215.39
LR_W-205	Local/Access	20	Widening	3rd Phase	118.41
LR_W-206	Local/Access	20	Widening	3rd Phase	100.76
LR_W-207	Local/Access	20	Widening	3rd Phase	22.89
LR_W-208	Local/Access	20	Widening	3rd Phase	56.59
LR_W-209	Local/Access	20	Widening	3rd Phase	86.21
LR_W-210	Local/Access	20	Widening	3rd Phase	54.83
LR_W-211	Local/Access	20	Widening	3rd Phase	150.60
LR_W-212	Local/Access	20	Widening	3rd Phase	100.18
LR_W-213	Local/Access	20	Widening	3rd Phase	100.33
LR_W-214	Local/Access	20	Widening	3rd Phase	361.43
LR_W-215	Local/Access	20	Widening	3rd Phase	91.49
LR_W-216	Local/Access	20	Widening	3rd Phase	179.39
PR_N-06	Regional	120	New Construction	1st Phase	186.09
PR_N-07	Regional	120	New Construction	1st Phase	138.54
PR_W-51	Regional	120	Widening	1st Phase	618.09
PR_W-52	Regional	120	Widening	1st Phase	413.39
PR_W-53	Primary	80	Widening	1st Phase	149.33
PR_W-54	Primary	80	Widening	1st Phase	515.28
PR_W-55	Primary	60	Widening	1st Phase	754.67
SR_W-39	Secondary	40	Widening	2nd Phase	639.56
SR_W-40	Secondary	40	Widening	2nd Phase	604.87
SR_W-41	Secondary	40	Widening	2nd Phase	83.10
TR_W-18	Tertiary	30	Widening	2nd Phase	452.97
TR_W-19	Tertiary	30	Widening	2nd Phase	371.93
WW_N-37	Walkway	15	New Construction	2nd Phase	613.61
WW_N-38	Walkway	15	New Construction	2nd Phase	572.73
WW_N-39	Walkway	15	New Construction	2nd Phase	376.99
WW_N-40	Walkway	15	New Construction	2nd Phase	134.57
WW_N-41	Walkway	15	New Construction	2nd Phase	977.34
WW_N-42	Walkway	15	New Construction	2nd Phase	93.84
WW_N-43	Walkway	15	New Construction	2nd Phase	468.12
WW_N-44	Walkway	15	New Construction	2nd Phase	282.42
WW_N-45	Walkway	15	New Construction	2nd Phase	77.90
WW_N-46	Walkway	15	New Construction	2nd Phase	1003.34
WW_N-47	Walkway	15	New Construction	2nd Phase	62.02

14.11.3.4 Drainage Development Plan

Existing drainage is mostly depending on natural drainage facilities. The proposed drainage facilities will be developed based on this natural channel and will be connected by 5.73 km secondary drain and 5.45km tertiary drain in the first Ward Action Plan. Table 14.49 shows the details.

Table 14.53: Proposed Drainage Development Plan Proposals

Proposed Drain ID	Proposed Drain Type	Proposed Width (M)	Proposed Status	Phasing	Length (KM)
SD-28	Secondary	1.50	New Construction	First Phase	0.01
SD-29	Secondary	1.50	New Construction	Second Phase	5.73
TD-23	Tertiary	1.00	New Construction	First Phase	0.00
TD-24	Tertiary	1.00	New Construction	Second Phase	4.53
TD-25	Tertiary	1.00	Widening	Second Phase	0.92
Ward No. 09 Total					11.19

14.11.3.5 Urban Services

a. Solid Waste Management

Solid waste management is a major urban service. As density of population increases the volume of solid waste also increases proportionately. However, the income level is also a major factor influencing the volume of solid waste. Population and the volume of waste in the Paurashava are yet to be large enough to become a problem for the town. But the present management system is not satisfactory and it might lead to problem in future. The consultant does not propose solid waste transfer stations or disposal site in this Ward. They also do not propose any other utility services, like water supply and sanitation system for this zone.

b. Water supply and Sanitation

The proposed water treatment plant and the water supply system will improve the water supply condition of the Paurashava as a whole after the implementation of this Master Plan. The Paurashava must try to promote hygienic sanitation to ensure better public health for the entire Paurashava.

Table 14.54: Urban Development Proposals of Ward 09

Development Proposal Type	Development Proposal Name	Proposal ID	Phasing	Mouza Name_JL No._Sheet No.	Plot No.	Area (Acres)
Commercial Zone	Gorur Hat	GH-01	2nd Phase	Shibnagar_27_00	110, 116-121, 142, 144-149, 9999	4.63
	Neighborhood Market	NM-11	2nd Phase	Shibnagar_27_00	399, 402	0.22
Community Facilities	Community center	CC-02	2nd Phase	Shibnagar_27_00	337, 338	0.65
Education & Research Zone	Primary school	PS-04	2nd Phase	Shibnagar_27_00	76, 79-81, 109, 112	1.54
	Secondary School	SS-04	2nd Phase	Shibnagar_27_00	382-393	1.14
Government	BCIC	B-01	2nd Phase	Shibnagar_27_00	300, 524	1.77

Development Proposal Type	Development Proposal Name	Proposal ID	Phasing	Mouza Name_JL No._Sheet No.	Plot No.	Area (Acres)
Office						
Health Facilities	Maternity Clinic	MC-06	2nd Phase	Shibnagar_27_00	499, 663	0.49
Mixed Use Zone	Ward Councilor's office	WC-09	1st Phase	Shibnagar_27_00	430-432, 663	0.35
Open Space	Central Park	CP-01	1st Phase	Kaligonj_17_02	786, 788-791, 793-795, 797-802, 1097	0.12
				Shibnagar_27_00	682, 724, 735, 740-742	0.59
			2nd Phase	Kaligonj_17_02	682, 724, 735, 740-742	0.52
				Shibnagar_27_00	450	0.10
	Park	P-01	1st Phase	Kaligonj_17_02	1097	0.00
				Shibnagar_27_00	450	1.42
		P-09	2nd Phase	Kaligonj_17_02	682	0.94
				Sreerampur_18_00	869	3.88
		P-10	3rd Phase	Sreerampur_18_00	793, 865, 866, 869, 1042-1047	2.89
Transportation Facilities	Tempo Stand	TS-06	2nd Phase	Shibnagar_27_00	508	0.23
Utility Services	Slaughter House	SH-03	2nd Phase	Shibnagar_27_00	402	0.06
Ward No. 09 Total						21.57

**Map 14.18: Proposed Road, Drainage and Utility Services Plan for Kaliganj Paurashava
(Ward No. 09)**

14.12 Implementation Guidelines

The Master Plan of Kaliganj Paurashava will be an effective tool for planned urban development, if it is implemented properly with legal enforcement. The different components of the Master Plan have varied implications if they are not implemented in an integrated manner. There is no separate laws related directly to the implementation of Master Plan of the Paurashavas in the country other than the Local Government (Paurashava) Act, 2009 and some relevant national policies and laws as discussed in chapter 5 under the Structure Plan.

However, the legal provisions that have been made in the Local Government (Paurashava) Act, 2009 can effectively be applied in the implementation of the Master Plan of Kaliganj Paurashava for the time being along with other relevant national policies and laws that have also implications at Paurashava level, such as Wetland Conservation Act 2000 and BNBC 1993. Other national policies, guidelines and laws relevant to population, agriculture, environment, tourism, building materials, building construction etc. have implications for the implementation of various components including the Ward Action Plan of the Master Plan of Kaliganj Paurashava.

Therefore, until specific laws and guidelines are made by the government for the Paurashavas in Bangladesh for the implementation of Master Plans, the existing laws, policies and guidelines should be strictly followed so that the goal and objectives of these plans are achieved. Effective application of the various existing policies and laws require prudent exercise of professional knowledge and expertise, which is lacking in the existing human resources of the Paurashavas in Bangladesh. In particular, the Paurashavas require professional urban/town planner(s) in the setup of their manpower. In this context, there is an urgent need for the creation of a planning division/section in the existing set up of the Paurashava Organogram.

14.12.1: Proposals for Mitigation of Identified Issues

The critical issues of planning and development identified in the Structure Plan have been addressed through the preparation of Urban Area Plan and Ward Action Plan. The proposals made in these plans resolve the issues rose in the Structure Plan.

14.12.2: Comparative Advantage of Master Plan

The Paurashavas in Bangladesh do not have any practicing plans at present in regard to organized development of land use or infrastructure. This situation has been continuing over a long period of time in the past promoting spontaneous land and infrastructure development. As a result, there are examples of unplanned development creating discomfort to the people living in almost all Paurashavas in the country. The implementation of the currently prepared Master Plan of Kaliganj Paurashava will remove those obstacles by applying the principles, guidelines and Urban Area Plan will solve the most pressing needs of the town in infrastructure development.

14.13: Conclusion

The Paurashavas in Bangladesh for the first time in its history are having their detailed Master Plans prepared scientifically using modern tools and techniques. These Master Plans will be effective tools for planned development of most of the urban centers in Bangladesh. The planned township development will also ensure required services for the rural areas of the country. This in turn will make a positive impact on economic growth, social progress and environmental sustainability. The Kaliganj Paurashava must avail this opportunity for its progress in the future by implementing the Master Plan.

CHAPTER 15

CONCLUSION

15.1 Conclusion

Preparation of the Paurashava development plan is not an end in itself; rather it is an attempt to the beginning of a phase of development of an undeveloped area aspiring for development. Planning is far easier than development. In a developing country like Bangladesh, execution of spatial development plan is really a challenging task for any local government that so vastly rely on the central government for development budget allocation. Amid a host of other priority problems, the central government is often helpless in providing resources for small town's development, where problems are considered less important than those in larger cities. Keeping this constraint in view the local urban governments in smaller towns should emphasize on enhancing the capacity of generating their own resources. Besides, avenues must be searched to recover costs of development from the beneficiaries either directly or indirectly. Direct recovery can be charging development charges or taxes in various forms. Indirectly people can be involved project planning and implementation. This approach of development will benefit in two ways, first, it will create belongingness among people about development of their own areas and second, it will save public money required for development. Land can be procured from land owners for construction of local standard roads. This kind of participatory approach to development would directly benefit the land owner. Without a strong planning section the plans will never come true. There must be some one to take care of the plans and development control effectively. Finally, the Paurashava must give due importance to this plan document to streamline its future development. It must follow the plan for any development, otherwise the plan will lose its credibility and one day it will turn into waste paper which will simply accentuate the town's problems.