Government of the People's Republic of Bangladesh

Ministry of Local Government, Rural Development & Cooperatives

Local Government Division

KHOKSA 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

KHOKSA 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

KHOKSA PAURASHAVA

KHOKSA, KUSHTIA

KHOKSA PAURASHAVA MASTER PLAN: 2011-2031

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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, Khoksa 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 Khoksa Paurashava.

Master Plan of Khoksa 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 Khoksa 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 Khoksa Paurashava will be necessary to implement this Master Plan successfully and make this Paurashava developed and livable. I hope Khoksa Paurashava will be a model Paurashava in Bangladesh through building itself green and sustainable by successful implementation of this Master Plan.

(Anwar Ahmed Tatari)

Mayor

Khoksa Paurashava

EXECUTIVE SUMMERY

Khoksa Paurashava under Kushtia District is located in the center of Khoksa Upazila. It is situated at the bank of Gorai River. It is main focal point of economic growth of Khoksa upazila. Khoksa Paurashava is connected to Kushtia Sadar and Rajbari District Headquater by a Regional road. It is about 20 km from Kushtia City. Geographically it is located between 23°48′00″ N and 89°17′00”E.

According to the BBS 2011, the population of Khoksa Paurashava as per recorded in is 18319 of which 9223 (50.35%) are male and 9096 (49.65%) are female. The population of Khoksa is Muslim, Hindu, Buddhist and others. Khoksa is rich in a diversity of indigenous peoples, heritage, and culture.

Its present status is ‘C’ Class Paurashava. Khoksa Paurashava consists of 8 mouzas with an area of 6.84 sq. km. Khoksa come into existence as a Thana on the 25th October, 1932. It is upgraded to an Upazila on the 20th July, 1983.

Under such circumstances a Master Plan can help creating advantages for living and working in the Paurashava that will indirectly help attracting investment for economic growth leading to employment generation. There are not very much development activities going on and there is also lack of organized system of development activities at present. Current development emphasizes only on road and structural development. Other utilities are neglected here. The proposed Master Plan will induce such development activities that will ensure proper provisions of utility services, urban services and with these; social development. It will also ensure good and automated governance of the Paurashava and ensure good collection and utilization of its resources and thus enhance the development activities.

The Master Plan is prepared in three tiers. First one is Structure Plan, then Urban Area Plan and finally Ward Action Plan. The Structure Plan provides the policies that will guide the future development of the Paurashava. In the Structure Plan of Khoksa Paurashava maximum land is kept as urban area and the remaining as agricultural area and 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 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 also the resource mobilization process.

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.

Landuse Plan proposes the Paurashava land to be earmarked under Urban Residential Zone and Rural Settlement. These two zones will form the future residential areas of the Paurashava. Proposals for other land uses like Commercial Zone, Education and Research Zone, Open Space, Circulation Network etc. are made. Under the Land Use Plan the development proposals to support the future needs of the people are also given. It is proposes one heavy industrial zone, one Paurashava market, stadium, hospital, waste dumping ground, college, vocational training institute, low income housing project, bus terminal, truck terminal, central parks, high school,

primary school, playground, neighborhood park, kitchen markets playgrounds 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 23.76 km of road widening and 22.63 km of new road construction is proposed. The road hierarchy is proposed in this plan too. The proposed road network will comprise of primary road (100 ft, 80 ft and 60 ft RoW), secondary road (40 ft. RoW), tertiary road (30 ft. RoW) and 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. The proposed transportation facilities include bus terminal, truck terminal, auto-rickshaw/tempo stands, parking area and some other proposals.

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 10.57 km of pucca drain in the Paurashava and the natural canals cover 7.02 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 4.165 km of primary drain, 4.835 km of secondary drain and 4.879 km of tertiary drain are proposed in the plan to support the drainage network.

Ward Action Plan is the third and final tier of the Master Plan which 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.

Previously no Master Plan was prepared for Khoksa Paurashava town. This is the first Master Plan of the Paurashava prepared by LGED under Package-12 of the Upazila Towns Infrastructure Development Project (UTIDP). It is expected that the implementation of the plan will ensure planned development with compatible land use, development control, optimum utilization of land resources and socio-economic development of the urban dwellers.

Master Plan Report of Khoksa Paurashava

TABLE OF CONTENTS

PART A : STRUCTURE PLAN

PART B: URBAN AREA PLAN

PART C: WARD ACTION PLAN

ANNEXURE

APPENDIX

LIST OF TABLES

Part A: Structure Plan

Part B: Urban Area Plan

Part C: Ward Action Plan

LIST OF MAPS

Part A: Structure Plan

Part B: Urban Area Plan

Part C: Ward Action Plan

LIST OF FIGURES

Part-A: Structure Plan

Part B: Urban Area Plan

Part C: Ward Action Plan Report

LIST OF ABBREVIATIONS AND ACRONYMS

3D	Three Dimensional
AAT	Arc Attribute Table
ADP	Annual Development Plan
BBS	Bangladesh Bureau of Statistics
BIP	Bangladesh Institute of Planners
BM	Bench Mark
BS	Bangladesh Survey
BTM	Bangladesh Transverse Mercator
BUET	Bangladesh University of Engineering and Technology
BWDB	Bangladesh Water Development Board
CPA	Critical Path Analysis
CPM	Critical Path Method
CS	Cadastral Survey
DD	Degree Decimal
DGPS	Differential Global Positioning System
DPHE	Department of Public Health Engineering
FDI	Foreign Direct Investment
FFYP	Fifth Five Year Plan
Ft	Feet
GDP	Gross Domestic Product
GIS	Geographic Information System
GO	Government Organization
Govt.	Government
GPS	Global Positioning System
H/Q	Head Quarter
HBB	Haring Bone Bond
ICT	Information and Communication Technology
Km	Kilometer
LCC	Lambert Conformal Conic
LGED	Local Government Engineering Department
LGRD&Co.	Local Government, Rural Development and Cooperatives
M	Meter
MDG	Millennium Development Goal
MIDP	Municipal Infrastructure Development Project
NGO	Non-Government Organization
O-D	Origin – Destination
PAT	Polygon Attribute Table / Point Attribute Table
PCU	Passenger Car Unit
PD	Project Director
PDB	Power Development Board
PERT	Program Evaluation and Review Technique
PMO	Project Management Office
PMU	Project Management Unit
PWD	Public Works Department
R&H	Roads and Roads Department
REB	Rural Electrification Board
RL	Reduced Level
RS	Revenue Survey
RTK-GPS	Real Time Kinematic Global Positioning System
SME	Small and Medium Enterprise
STM	Standard Transverse Mercator
ToR	Terms of Reference
TS	Total Station Survey
UDD	Urban Development Directorate
UTIDP	Upazilla Towns Infrastructure Development Project

Chapter 1
Background

In Bangladesh the present average urban growth rate is about 2.85% (World Bank, 2010). Present trend of population increase indicates that by 2020 about 40% of the total population will live in urban areas. According to a recent survey it was revealed that 45% of urban populations have access to potable water while have limited access to sewerage facilities. In addition inefficient transport management greatly contributes to the problems in traffic and transportation system. These aspects are not only influence our urban life but also arrest the national economic growth of the country. On the other hand, demand for urban service facilities has increased substantially because of the population expansion in urban areas. The expansion of urban economy leads to the growth of urban population and concomitant haphazard urban spatial growth without planning.

The urban centers are going to be the focus of future employment and economic regeneration. The population and economic growth, particularly, in large urban centers is likely to boost in next few decades creating increased burden on them. The smaller urban centers imbued with opportunities for investment and livable environment can help release pressure on big cities at the same time serve as growth poles for development of undeveloped hinterlands. Without adequate infrastructure and services provision to support the increasing population and activities the small urban centers, it would be difficult to turn urban centers as environmentally congenial livable places. Planned development of infrastructure and services and development control through land use plan is essential.

The present infrastructure provisions in Paurashavas are in a precarious state. Drains are mostly clogged that cannot drain out water during heavy rains, 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 substandard road network can keep pace with the growing demand for movement; as a result congestion becomes a common problem. Road networks has 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 environment deterioration. Building Construction Rules has not effectively enforced in Paurashavas.

It is high time to think about problems that might be emerged in future if they are not addressed now. To overcome all likely problems to come in future, the Paurashava should go for planned development through preparation of a master plan and move the development forward accordingly. 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 aims to prepare master plan for 223 Paurashava upazila as for a period of next 20 years. The project keeps provision for a separate plan for land use control, drainage and environment, traffic and transportation management and improvement. The project aims to prepare a Ward Action Plan to ensure systematic execution of infrastructure development projects in future. There is also aim to prepare

proposals to enhance Paurashava revenue so that it becomes more capable of meeting its own capital needs. The master plan of Khoksa Paurashava will suggest development of new roads and bridges/culverts, drainage facilities, streetlights, markets, bus stands, solid waste management, sanitation, water supply and other infrastructure facilities to face future needs.

1.1 Objectives

The objectives of Paurashava Master Plan are to:

- Find the development issues and potential of the Paurashavas and make a 20-year development vision for the development;
- Plan for the people of the town to develop and update provisions for better transport network, housing, infrastructure for road, 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 the better quality of life; and
- 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 principal of sustainability.
- Provide controls for private sector development, clarity and security with regard to future development.
- Provide guidelines for development considering the opportunity and constraints for future development of Upazila Town.
- Prepare 20-years Master Plan to be used as a tool to ensure and promote growth of the city in line with the guideline principles of the master plan and control any unplanned growth by any private and public organization.

1.2 Approach & Methodology

The approach and methodology of planning that has been followed is worth mentioning here. Various studies are the integral part of the planning process, while the planning method covers a wide range of issues duly considered during the process of planning. In this Master Plan Preparation exercise, following Several-phases of planning methodology have been followed.

The methodology related for preparing the Master Plan/Urban Area Plan including Land Use Plan, Transportation and Traffic Management Plan, Drainage and Environmental Plan and Ward Action Plan for Khoksa Paurashava was taken under the following sequential way.

Phase 1: Preliminary Visit to the Paurashava

At first, the planning goals and objectives were conceived, preparations were made. A preliminary visit was made by the team of consultants to acquire basic idea about the areas to be planned. The goal in this step was to conceptualize the planning process and the operational activities.

Phase 2: Organize Inception Seminar

After conceptualize the planning inception, Seminar was held at the Khoksa Paurashava in which stakeholders was informed about the scope and Terms of Reference for the preparation of Master Plan and the output in this step was the preparation of an Inception Report.

Phase 3: Delineation of the Planning Area

Under the project (UTIDP), basing on existing condition, demand of Khoksa Paurashava and potential scope for future development, study area have been delineated.

Methodology involved in the process of establishment of Bench Marks (BM) and demarcation of existing Paurashava boundary and proposed planning area for Khoksa Paurashava is as follows:

A. Collection of Paurashava Gazette to identify the Existing Paurashava Area
B. Reconnaissance survey about Paurashava Growth Trend
C. Establishment of Bench Marks (BM)
    - Site selection
    - Construction and Installation of BM pillars
    - Establishment of Coordinate of BM Pillars (x,y,z i.e. Northing, Easting and RL in meter)
D. Establishment of Ground Control Points (GCPs)
E. Demarcation of Paurashava and Planning Area
    - Collection, Scanning and Digitizing of Mouza Maps
    - Edit Plot Checking of Digitized Mouza Maps
    - Geo-referencing of Mouza Maps
    - Joining and Edge-matching of Mouza Maps
F. Participation of Paurashava in the Demarcation of Paurashava and Planning Area.
G. Preparation of GIS Map Layout.

Phase 4: Carry out Detailed Survey for Khoksa Paurashava

A number of studies were conducted in order to prepare a database and get an insight into the existing conditions. The studies, however, have focused on three different but inter-related aspects; the physical condition of the town, the economic and social conditions of the people, and their perceptions about the problems and prospects of the town.

Data and information collected includes topography, physical features, physical infrastructures, land use, socio-economic and traffic and transportation situation of the study area. Detail Socio economic, Physical Feature, Traffic and Transport, Environment survey of Khoksa Paurashava area have been conducted according to the approved format of ToR. Other relevant data have also been collected from primary and secondary sources. These surveys and analysis of data and information have helped to find out possible area of intervention to accommodate future population of the Paurashava.

Total station based advanced technology for topographic, physical features; land use surveys done along with household sample survey for socio-economic information were used in the study. The Physical Feature Surveys were conducted covering the entire area

under the jurisdiction of Khoksa Paurashava. The stepwise works for survey and mapping are as follows,

- Reconnaissance survey;
- Collection of Mouza maps;
- Identification of Ground Control Point (GCP) on the Mouza maps;
- Geo-referencing of Mouza maps;
- Preparation of Arc/Info coverage;
- Preparation Edit Plot of Mouza maps;
- Planning Area Demarcation from Paurashava Gazette and detail information from the Paurashava authority;
- Establishment of Reference Bench Marks in the Project area;
- Detailed Physical feature Survey (Point, Line, Closed boundary);
- Spot level/Land level survey
- Detailed Land Use, Socio-economic, Drainage and Environment, Traffic and Transport survey;
- Survey Data processing and Preparation of GIS database;
- Preparation of GIS based physical feature survey Map layout;
- Verification of map at field level;
- Map production (all Categories).

All these information were collected using the modern survey equipments (i.e. Total Station, RTK-GPS, etc.). As per ToR, to collect the topographic information, RTK-GPS and Total Station (TS) were used as advanced survey techniques.

The following variables were measured in topographic survey: Land level/spot level at an interval of 50m in general cases but for high undulated areas this regular interval were decreased as necessary. Alignment and crest levels (not exceeding 50m) of road, embankment and drainage divides were also considered during taking spot levels. Contour map was prepared using 0.3m contour interval. Besides, alignment of rivers, lakes, canals drainage channels and outline of bazaars, water body, swamps etc. were also recorded in the physical feature survey.

Land use survey covered different uses of land i.e. agricultural, residential, commercial, industrial, community services, educational, transport and communication, water body, vacant land and circulation network etc. Land Use Surveys were conducted by recording the current use of the land within the project area. Physical feature survey data and maps were used as the basis for land use survey.

The drainage information was primarily collected from the topographic and physical feature surveys. Some additional information has also been collected through key Informant Survey of knowledgeable personal of the Paurashava using an unstructured questionnaire.

Through the socio-economic survey data on population, family size, distribution of age/sex, occupation, household structure, dwelling occupancy, migration pattern, education status, Income and expenditure level, land ownership pattern, land value, health facilities, recreational facilities etc. were collected. Detailed traffic and transportation

survey was conducted through traffic volume survey, origin destination (O-D) survey and speed survey, Congestion point, inventory of road networks etc.

Phase 5: Preparation of Base Maps and Survey Report

After conducting the all sorts of survey, processing and analysis of survey data of the planning area, base maps incorporating all the natural features and man-made infrastructures along with their alignment and essential attribute were prepared by the consultant. The final outcome of this phase is preparation of survey report which illustrates the components of survey in order to understand the existing condition of the project area.

Phase 6: Preparation of Interim Report

This is an intermediary phase towards preparation of Master Plan for Khoksa Paurashava which involves projection of population and landuse, thorough review of existing policies relevant to the different development sectors, assessment of institutional capacity of the Paurashava. An overview of recent past budget and the list of existing/recent past infrastructure related development schemes undertaken by the Paurashava have also been reviewed at this phase to get an idea of financial capacity of the Paurashava Authority.

Phase 7: Analysis and Projection of Existing and Future Condition

This phase involves analysis of existing trend of growth based on maps, BBS data and other primary and secondary data relevant to the project area and projection of future requirement through assessing the growth direction, planning standards provided by LGED and the projected population for the planning period.

Phase 8: Public Consultation Meeting

The eighth phase of the methodology of Final Master Plan is to conduct 'Public Consultation Meeting' where discussion on existing facilities and services, future requirements, identification of proposals on maps and field verification have been conducted. The proposals have been finalized after conforming and incorporating the views and ideas of the stakeholders.

Phase 9: Preparation of Final Master Plan for Khoksa Paurashava

The ninth phase of the methodology is 'Preparation of Final Master Plan Report'. This portion of the methodology is directly linked with three different issues, which are – Structure Plan, Urban Area Plan and Ward Action Plan.

In the **Structure Plan**, Paurashava's existing trend of growth and the development problems are identified; whereas, the future land use, future population and the future growth by 2031 of Khoksa is projected. Finally, a Policy Zoning Map is prepared and optimum use of urban resource strategy is taken to implement and ensure better urban environment.

The **Urban Area Plan** is composed with four parts, which are Land Use Plan, Transportation and Traffic Management Plan, Drainage and Environmental Management Plan and Plan for Urban Services

Land requirements for each broad category of land uses have been determined based on projected population for a time period of 20 years and the recommended Planning Standards provided by LGED in the **Land Use Plan**. After estimating land requirements, allocation of uses is made based on land suitability. A land suitability analysis is performed on a qualitative basis through field visits, consultation meeting, analysis of topographic

map, physical feature map and soil condition to justify the suitability of land for a specific use. Land allocation is a process which depends on the demand and supply of land. Whereas land suitability yields information on supply, land requirements indicate demand of land available for development. Final land allocation or land use recommendation for competing uses is then shown on proposed land use plan map and described in detail in the explanatory report.

The first step of the methodology of **Transportation and Traffic Management Plan** is to identify the existing transport condition, which is the result of O-D survey, traffic survey at intersection, traffic survey at links and speed study; have already described in the survey report. In the next step, the future projection of transportation network and traffic demand is identified, which is described in the interim report. The third phase of the study is to adopt new traffic and transportation management plan, which is prepared based on future projection. After that, some strategies on transportation system management (TSM) are undertaken. Finally, plan implementation strategies are espoused based on both transportation management plan and transportation system management.

Preparation of the **Drainage Plan** involves (I) analyzing the existing conditions related to drainage facilities and the flood management (II) identifying major drainage outfalls and on the basis of the outfalls splitting the total drainage area into a number of drainage zones (III) defining all pertinent design criteria and (IV) defining drainage facility requirements and sizing. The drains are designed to collect excess rainfall that comes as surface runoff from urban area, convey the runoff and finally discharge them to outfalls. The design of drains involves hydrological computations of rainfall intensity, its frequency of occurrence, duration etc., and the total runoff of a particular area.

The **Environmental Management Plan** consists of the Supplementary Living Environment Survey, the Comprehensive Ecological Survey and the Water Quality Survey. The Supplementary Living Environment includes water supply, land pollution, sewerage and sanitation, solid waste management, and resettlement of population due to construction of canals and primary drains. The Comprehensive Ecological Survey aims at facilitating comprehensive environmental assessment by subsequent urbanization and implementation of the drainage on the ecological elements of fauna and flora, agricultural and aqua cultural resources etc. The Water Quality Survey is the sampling and analysis of surface water from rivers, natural canals, ponds etc., and from ground water. These are required to be done to ensure necessary urban environment enhancement measures.

In case of **Urban Services**, the existing condition of urban services is analyzed. After that, future urban service requirement is estimated and some proposal has provided. Finally, to implement the proposal some strategies are undertaken.

The last step of the methodology is **Ward Action Plan;** conceptualize the content and background of the plan. In the next step, the linkage with Structure Plan & Urban Area Plan is identified. The final phase of the study is to adopt ward action plan in details. The proposal and planning, priority tasks and cost estimation are incorporated here to get a pictorial view of the Ward Action Plan.

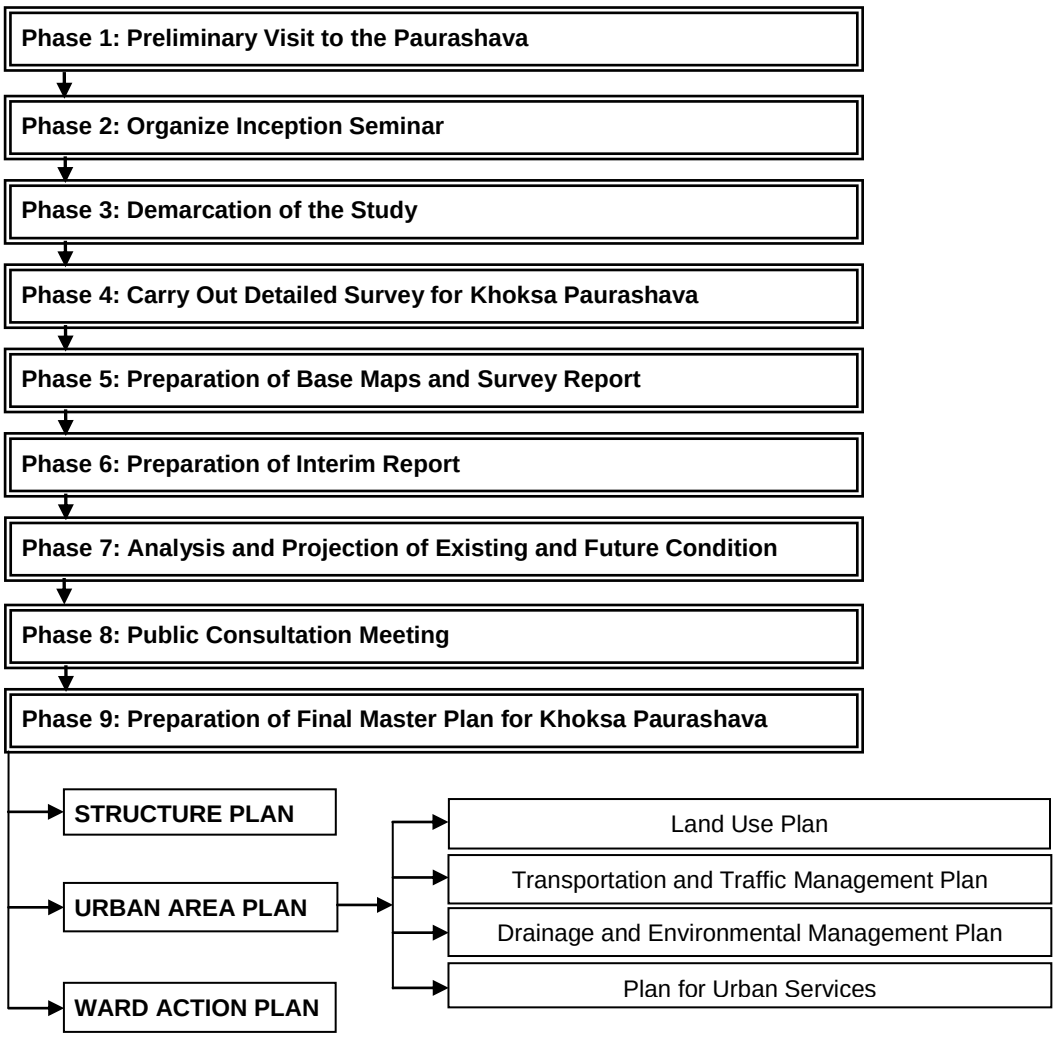

Figure 1.1: Flow Chart of Methodology

1.3 Scope of work

The scope of work under this Consultancy services will cover all aspects related to the preparation of Master Plan/ Urban Area Plan which will include, land Use Plan, Traffic Management Plan, Drainage and Environment Plan and Ward Action Plan for the listed Upazila Town. In order to prepare plan the activity will contain but not limited to the following:

- Visit the Paurashava included under the package work and list the passive name of Paurashava that will undertake preparation of Master Plan. In case if any Paurashava has already prepared Master Plan it has no need for Paurashava of Master Plan then it will be excluded from the package, written opinion of the concerned Chairman of the Paurashava whether or not Master plan Preparation will be included. A copy of list of Paurashavas feasible for preparation of Master Plan will be submitted to the office of the PD, UTIDP.

- Organize an inception Seminar at the Paurashava level and inform of the Paurashava about the scope and terms of reference for the preparation of Master Plan. Make a thorough investigation and based on potential scope and opportunities available in the Paurashava develop a 20 years development vision for the Paurashava liking the ideas and view of the Paurashava.
- Determine the study area based on exciting condition, demand of the Paurashava and potential scope for future development. Carry out detailed socio-economic Demographic and Topographic survey of the Paurashava area following approved format and collect data from primary and secondary sources. Analyze such data and information, find out possible area of intervention to forecast future population of such Paurashava (15-20 years), vis-a-vis assess their requirement for different services, physical and social infrastructure facilities, employment generation, housing right of way and land requirement for the existing and proposed roads, drains, play grounds, recreation centers and other environmental and social infrastructure.
- Identify and investigate the existing natural and manmade drains, natural river system, assess the extension and frequency of flood, determine area of intervention. Study the contour and topographic map produced by the relevant agencies and also review any previous Drainage Master plan available for the Paurashava.
- Prepare a comprehensive (storm water) Drainage master plan for a plan period of 20 years. In such exercise consider all relevant issues including discharge calculation, catchment area, design of main and secondary drains along with their sizes, types and gradients and retention areas with primary cost estimates for the proposed drainage system.
- Recommend Planning, institution and legal mechanism to ensure provision of adequate land for the establishment of proper right of way of (storm water) drainage system in the Paurashava.
- Collect and assess the essential data relating to existing transport land use Plan, relevant regional and natural highway development plan, accident statistics, number and type of vehicle registered of each Paurashava.
- Assess requirements of critical data and collect data through reconnaissance and traffic survey, which should estimate present traffic volume, forecast the future traffic growth, identification travel pattern, areas of traffic conflict and their underlying cause.
- Study the viability of different solution for traffic management and develop a practical short term traffic management plan, including one way systems, restricted access for large vehicles, improved signal system traffic islands, roundabouts, pedestrians crossing, and deceleration lanes for turning traffic, suitable turning radius, parking policies and separation of pedestrians and rickshaws etc.
- Assess the non-pedestrian traffic movements that are dominated by cycle rickshaw. Special recommendations should be made of as to how best to utilize this form to transport without causing unnecessary to other vehicles. Proposal should also consider pedestrians and their safety, with special children.
- Assess the current land use with regard to road transportation, bus & truck station, railway station etc, and recommend action to optimize this land use.

- Prepare a road net work plan based on topographic and base map prepared under the project. Recommend road development standards, which will serve as a guide for the long and short term implementation of road. Also suggest Traffic and transportation management plan and also suggest a traffic enforcement measure to be taken.
- Prepare the Master Plan with all the suitable intervention, supported by appropriate strategic policy, outline framework, institutional arrangement and possible source of fund for effective implementation of the plan.
- Prepare a plan to set out proposed Master Plan at 3-levels namely Structure Plan, Master Plan/ Urban Area plan and Ward Action Plan.
- At the first level, work out frame strategy policy for the preparation of a structure plan for each Paurashavas under the package. As a follow up of structure Plan prepare a master plan consisting a land use plan. Transportation and traffic Management Plan, Drainage and Environment Management Plan and Ward Action plan.
- Make a total list of primary and secondary roads, drains, and other social infrastructures for each Paurashava for a plan period of 20 years. Examine and classify according to the existing condition, propose long, medium and short-term plan and estimate cost for improvement of the drain and alignment and other infrastructures.
- In line with the proposed Master plan propose a Word Action Plan with list of Priority schemes for the development of roads, drain, traffic management and other social infrastructures for implementation during the first five years of the period.
- Organize with the help of concerned Paurashava at least 2 public consultation meeting/seminar one for discussion on interim report and the other on draft final Report on the proposed Master plan. Integrate beneficiary's point of view in the plan with utmost careful consideration.
- Prepare and submit Master plan and Report with required standards as required by the TOR.

1.4 Organization of the Report

The Khoksa Paurashava Master plan Report is organized into three main parts namely- Part A: The Structure Plan, Part B: The Urban Area Plan and Part C: The Word Action Plan.

Part A: (Chaper 1- 9): is the **Structure Plan** is a policy guideline plan for next 20 years period. It describes Paurashava's existing trend of growth and the development problems are identified; whereas, the future land use, future population and the future growth by 2031 of Khoksa is projected. Finally, a Policy Zoning Map is prepared and optimum use of urban resource strategy is taken to implement and ensure better urban environment.

Part B: (Chapter 10-13): is the **Urban Area Plan**. The Urban Area Plan is for 10 years period up to 2021. It has been divided into four main sub-parts as follows: 1) Land use Plan, 2) Transportation and Traffic Management Plan, 3) Drainage & Environmental Management Plan and 4) Plan for Urban Services.

1) The Land use Plan identifies approaches of planning, existing and projected land use and proposed land use. Requirement of land for different purposes, land use zoning and plan implementation strategies are also included here.

2) The Transportation and Traffic Management Plan includes existing conditions of transportation facilities, intensity of traffic volume, degree of traffic congestion and delay, analysis of existing deficiencies, travel demand forecasting for next 20 years, future traffic volume and level of services and transportation development plan. Moreover, transportation system management strategy and plan implementation strategies are also presented in this plan.

3) Drainage and Environmental Management Plan again subdivided into two parts - Drainage part and Environment part.

   Drainage Management Plan describes the existing drainage network, land level and topographic contour. Plan for drainage management and flood control and plan implementation strategies are the components of the drainage part.

   Environmental Management Plan describes the existing environmental condition, solid waste and Garbage disposal, environment pollution, water logging, natural calamities and localized hazards, plan for environmental management and pollution control and plan implementation strategies are the key issues of the environment part.

4) Plan for Urban Services describes the existing condition and demand of the Services, projection on existing and proposed Urban Services, Proposals for Urban Services and Implementation, monitoring and evaluation of the Urban Services Plan are the key issues of this part.

Part C (Chapter 14- 27): is the **Ward Action Plan**. The Ward Action Plan is spanning for the 5 years period. The Structure Plan paints the broad picture on the future pattern of housing, jobs, transport, services and the environment. Ward Action Plan is much more specific. They tackle the problems and opportunities associated with individual communities and show exactly where it apply. The proposal and planning, priority tasks and cost estimation are incorporated here to get a pictorial view of the Ward Action Plan.

Chapter 2

Introduction to Structure Plan

2.1 Background of the Paurashava

Khoksa Paurashava under Kusthia District is located in the center of Khoksa Upazila. Khoksa Township located beside the Gorai River with an area of 6.84 sq. km or 1690.35 acres

. The Paurashava is comprised of 9 Wards and 8 Mouzas. Geographically it is located between 23°48′00″ N and 89°17′00”E. Location of the Paurashava is showed in **Map-2.1** (Location Map of the Paurashava).

According to the BBS 2011, the population of Khoksa Paurashava as per recorded in is 18319 of which 9223 (50.35%) are male and 9096 (49.65%) are female. The population of Khoksa is Muslim, Hindu, Buddhist and others. Khoksa is rich in a diversity of indigenous peoples, heritage, and culture. At present, the density of population is 2678 per sq.km.

Khoksa Paurashava designated as a Class ‘C’ was declared as a Paurashava through a government notification dated on 1st February, 1997. Khoksa come into existence as a Thana on the 25th October, 1932. It is upgraded to an Upazila on the 20th July, 1983.

The development scenario of Khoksa Paurashava shows a very grave situation. The town has evolved as an administrative center of Upazila Parishad. No other factor lies behind the growth of the town. The roads and other infrastructures have been developed for functioning of the Upazila Headquerters. Residential and commercial development has taken places following the road network leading to ribbon development. The houses have built in haphazard manner without considering any planning standards and provisions.

The main and secondary drains and natural streams in the Paurashava Town do not function as an integrated drainage system. Encroachment on drainage reservations causes inundation to many areas, including houses and roads, during heavy storms. There are very few roadside drains only in the central part of the town.

Equally, the traffic and transportation problem in Khoksa has been continuously increasing as the development and management of road network has not been commensurate with the increasing demand for its usage. Traffic congestion, accidents, pedestrian and parking difficulties, air and noise pollution are among the problems. In the absence of proper Master Plan construction of all types of infrastructure like houses, roads, drains, markets are going on in unplanned pattern. This situation is creating an adverse effect in the original landscape thereby creating environmental hazards.

Map 2.1: Location Map of Khoksa Upazila within Bangladesh

2.2 Philosophy of the Master Plan

The Philosophy behind Khoksa Paurashava Master Plan lies in the very motive to community welfare through a process of spatial organization, environmental improvement and provision of amenities to the future generations.

Planning for the future should be based upon enhancing the quality of life and create all the possible facilities such as residential, commercial, educational, recreational, infrastructural, utilities etc.

Like any town Khoksa also wish to promote economic and social prosperity in this town, and thus continually strive to balance quality of life issues with prosperity. To that end, it believes the following considerations are critical:

- That any development should be harmonious, and aesthetically pleasing, as well as consistent with the character of the town;
- That the land uses such as residential, commercial, industrial etc. should be environmentally safe and compatible with existing structures, terrain and landscape;
- That it must keep the air, groundwater, khal, beel and other surface waters clean and safe.

2.3 Vision & Objectives of the Structure Plan

Vision:

The Vision seeks to encapsulate the outcomes sought through the combination of objectives and strategies contained in this Structure Plan. The vision diagramed in the Structure Plan shows changes and choices about how our Paurashava town might develop. The Plan reflects significant decisions made in several key areas:

- Develop the Paurashava in the most planned manner by controlling the unplanned and haphazard development and manage the land uses in the most compatible manner so that it can save our precious agricultural land.
- Reduce the increasing pressure of population by controlling density and also to reduce population influx pushing towards the capital city.
- Develop the transportation network and to provide the different utilities and services.
- Amenities of the Paurashava are to be increased and kept provision of open spaces, play fields and recreational areas for all class of people.
- Promote income-generating activities for the low-income people within the Paurashava jurisdiction.
- Indicate the direction of growth and commercial development patterns.
- Develop the Paurashava as a self-dependent entity.

Objectives:

The purpose of the Structure Plan is to outline a preferred pattern of development from the perspective of the Paurashava as a service provider and planning authority. The objectives of the Structure Plan are identified as follows:

- Accommodate future residential, commercial and industrial development in appropriate locations.

- Manage the future growth through proper planning and appropriate development controls
- Preserve high value agricultural lands, natural features and open spaces.
- Ensure optimum use of urban land resources through proper development strategies.
- Discourages the sitting of land uses that are incompatible with adjacent land uses
- Seek the options for enhancing the non-agricultural economic activities and employment opportunities.
- Enhance the connectivity of the Paurashava in the regional transport network as well as among different areas/neighborhood within Paurashava boundary.
- Promote a livable living environment free from pollution, hazard and disaster.
- Ensure public safety and security from fire extinguishing, accidents etc.

2.4 Content and form of Structure Plan

Structure Plan is basically concerned with development of broad strategies for managing and promoting efficient urban development over the long term and attempts to integrate economic, physical and environmental objectives. Thus, Structure Plan provides a broad frame work for development activities over a long period of time in and around the Khoksa Paurashava.

The process includes studies on future growth potentials of the area/regions. It then identifies basic strategic options available to accommodate the anticipated growth. After evaluation the preferred strategic option is accepted. The preferred strategy then identifies spatial and other structural issues relating to the overall development of Khoksa Paurashava Town. It also provides area-wise strategies for expansion of different urban activities in space. The Structure Plan also outlines major sectoral policies to guide development in the desired manner over a longer period of time.

However, Khoksa Structure Plan is focused primarily on the physical form and development pattern of the Paurashava Urban Center on the Maps and Reports that sets forth a basic framework, showing how Khoksa Paurashava should grow and evolve over the next 20 years. It will serve as a blueprint towards the desired future described in the Vision & Goals element of urban center.

Chapter 3

Paurashava's Existing Trend of Growth

3.1 Social development

Khoksa Paurashava is inhabited by cent percent local people who have been inherited their land for a long time. The social composition is from rich to poor and different religious groups are living together. Khoksa Paurashava was established in 1st February, 1997. So the socio-economic data of Khoksa Paurashava is available in BBS 2011. However, some social data of the Paurashava has presented below.

Population

According to the BBS, 2011 (Kushtia District), the population of Khoksa Paurashava as per recorded in 2011 is 18319 out of which 9223 (50.35%) are male and 9096 (49.65%) are female. Most of the population of Khoksa is Muslim (89.05%). There are few Hindu and Christian community too. At present, the density of population is 2678 per sq.km.

Age-Sex structure

According to BBS 2011, combined age-group 0-9 comprises 20.2% and the age- group 10-19 years comprises the 19.6% of the total population of the Paurashava. The age-group 20-49 shows 44.5% of total population. The age group 50-64 is another group to be mentioned here which comprises the 10.4%. Besides, the population above 65 years is found to comparatively lower constitute only 5.3% of the population of the Paurashava.

Household

According to BBS 2011 the total household of Khoksa Paurashava is 4264 with average household size is 4.3.

Education

According to BBS 2011 an increasing trend of literacy is observed in the Khoksa Upazila over the decades. The literacy rate is 58.8% in 2011 against 49.90% in 2001. It appears that the literacy rate has increased for both sexes in 2011 over 2001.

In the project area it is found that about 88.09 percent people have attained education level ranging from primary level to higher education. Out of the total sample population 11.91 percent never attended school. People with primary level education (Class I-V) accounts 40.14 percent. People with high school level education (Class VI-X) constitute 28.2 percent. About 14.67 percent people are reported to have attained higher secondary level education. About 5.08 percent people are with above higher secondary education level.

There are in all 31 educational establishments in the project area. It has a total 14 primary schools, 3 high schools, 4 colleges and 6 Madrashas. The area is not served by any academic institute of national importance. Among NGOs BRAC has significant role in education for poor and deprived children. Several numbers of schools by BRAC are found in different part of the town.

Income Level

The socio-economic survey reveals that more that 21.03 percent household have a monthly income of Tk. 5000 or below and may be classified as poor. The people with income ranging from Tk. 5001-10000 constitute 63.45 percent household. The high income people with above Tk.15000 constitute only 2.67 percent households. It also reveals that mean monthly income of the project area is Tk.6434.15.

Religion

According to latest population census report (2011), 89.06% of the population of this Paurashava belongs to Muslim community and 10.88% to Hindu community. Population belonging to other religion such as Christian (0.06%) and Buddhist are very insignificant in number.

Occupation

People are engaged in different activities for earning their livelihood such as agriculture, industry, construction, business, service etc. However, most of the people belong to 'non-working group' and 'other working group' categories. Majority of the people belong to 'service' category among the main occupational groups categorized in BBS (2011).

Land ownership and value

The cent percent people of Khoksa Paurashava are local. The occupied inherited land areas and have been changing the ownership due to sale and purchase.

From the socio-economic survey it has been found that Average value of habitable land is Tk. 61000.00 per decimal. In Khoksa Paurashava, medium high land is Tk.25000.00 to Tk.94500.00. The value is seems to be slightly high because there may be presence of few commercial land under this category. The value of land depends on different existing and future opportunities.

3.2 Economic development

Economic development is the increase in the standard of living of people. Its scope includes the process and policies by which a nation improves the economic, political, and social well-being of its people. Economic development typically involves improvements in a variety of indicators such as rates, life expectancy, and poverty rates. A country's economic development is related to its human development, which encompasses, among other things, health and education. These factors are, however, closely related to economic growth so that development and growth often go together.

In Khoksa Paurashava, an economic development has been taken place over last few decades. Being located in a strategically important position the town has been evolved as a small trade and agro-based industry. Economic base of the Paurashava has been gradually shifting from traditional agriculture to commerce, business and other non-agricultural activities. Furthermore, Khoksa is a business center of HYV of seeds, pesticides and chemical fertilizer for the respective region. This ultimately raises the both the agricultural productivity and business outcome. The geographical location of the Paurashava and its well connectivity in the regional set-up are identified as prime mover to raise the economic growth of the Paurashava. Infrastructural development as an administrative center of Upazila Headquarters is identified to be one of the fundamental

reasons behind such economic development. After establishment of Upazila, this area has been developed as a hub of small trade and business of the entire Upazila. However, the central part of the Paurashava is found to have high economic growth compared to other parts of the town.

3.3 Physical infrastructure development

Physical infrastructures includes different type of natural features e.g. water bodies and man-made structures e.g. buildings, roads, bridges, culverts, canals, drains, embankments, sewerage lines, industries, offices, institutions, health centers, storage/ godowns etc.

From survey report, one River e.g. Gorai River and one khal are identified as natural water bodies. The length of those natural water bodies has measured as 7.02 km passing through the Paurashava.

In the Khoksa Paurashava over the last few decades as many as 9239 number of structures has been developed of which 8535 residential buildings, 467 commercial buildings, 28 industrial buildings, 72 educational buildings, 4 health structures (hospitals), 35 religious structures, 13 bridge & culverts, 10.57 km pucca drain and 60.206 km (41.34 acres) road has been developed. It is found that the physical growth of the town is mainly formed through the circulation network in a linear pattern. There is a cluster of development in the core part of the Paurashava surrounding the main bazar in Janipur and Khoksa Mouza.

3.4 Environmental growth

The term environmental includes rainfall, geological condition, surface and ground water pollution, water bodies, drinking water quality, sanitation, land pollution, air pollution, noise pollution, flooding, water logging, drainage blockage, natural and manmade disasters, collection and disposal of solid waste. Environmental growth is means to minimize the adverse environmental impacts on land pollution, water and air quality and biodiversity resources by energy usage, transport network, waste management, slum improvement, disaster mitigation etc.

The urban environment of the Khoksa Paurashava includes both built and natural environment. Built environment includes waste management, water, air quality, energy usage, transport network, slum improvement and disaster mitigation. The urbanization where the built environment overburdens the natural environment cannot be sustainable. So in every phase of planning processes all these environmental issues will be evaluated and proper measure will be taken to minimize the adverse environmental impacts on land pollution, water and air quality, biodiversity resources, transport network, waste management, slum improvement, disaster mitigation etc.

3.5 Population

According to Population Census 2011, the total population of Khoksa Paurashava is 18319 of which 9223 (50.35%) is male and 9096 (49.35%) are female. Ward wise distribution of population is shown in **Table 3.1**. Most of the populations of Khoksa are Muslim; there are also Hindu, Buddist and few Tribal groups like, Garo, Hajong, Hodi, Mandai and Koch. At present the density of population is 2678 per sq.km. As per

Population Census 2011, total household of Khoksa Paurashava is 4264 and sex ratio is 101.39. During the period 2001 to 2011, population increased in Khoksa Paurashava at the rate of 1.25 percent per annum for both sexes. The Population growth trend of Khoksa Paurashava is shown in **Table 3.2**.

Table 3.1: Ward-wise Distribution of Population

Ward	Population' 2011					
	Male		Female		Total	
	No.	%	No.	%	No.	%
Ward No.01	995	5.43	980	5.35	1975	10.78
Ward No.02	1219	6.65	1234	6.74	2453	13.39
Ward No.03	1045	5.70	971	5.30	2016	11.00
Ward No.04	857	4.68	796	4.35	1653	9.02
Ward No.05	926	5.05	876	4.78	1802	9.84
Ward No.06	984	5.37	957	5.22	1941	10.60
Ward No.07	725	3.96	776	4.24	1501	8.19
Ward No.08	1157	6.32	1221	6.67	2378	12.98
Ward No.09	941	5.14	947	5.17	1888	10.31
Extension Area	374	2.04	338	1.85	712	3.89
Total	**9223**	**50.35**	**9096**	**49.65**	**18319**	**100.00**

Source: BBS, 2011

Table 3.2: Population Growth Trend

Census Year	1981	1991	2001	2011
Population	2819	7986	13152	18319

Source: BBS, 1991, 2001 & 2011

3.6 Institutional capacity

In general terms, capacity can be defined as "the ability to perform functions, solve problems and set and achieve objectives". Capacity is systemic, so, in some sense, all dimensions of institutional capacity deserve attention. Khoksa Paurashava consists of 9 wards. It has one elected Mayor, 9 elected councilors and three reserve women councilors. There are total 15 numbers of employees in Paurashava (**Table 3.3**).

Table 3.3: List of Existing Manpower

Designation	Existing Manpower
Asstt. Engineer	01 Person
Sub-Asstt. Engineer (civil)	01 Person
Work Assistant	01 Person
Secretary	01 Person
Account Officer	01 Person
Account Assistant	01 Person
Tax Assessor	01 Person
Tax Collector	01 Person
Vaccinator	03 Persons
MLSS	02 Person
Night Guard	01 Person

Source: Khoksa Paurashava, 2011

Existing logistic support of Khoksa Paurashava is not satisfactory. To run the Paurashava smoothly with its multilateral function, the existing logistic support/ equipment should be

improved in such a way that no function can be left. However the existing logistic support/ equipment of Khoksa Paurashava are given in **Table 3.4** below:

Table 3.4: Logistic support/Equipment of Khoksa Paurashava

Sl. No.	Type of Equipment	Number
01	Road Roller	01
02	Garbage Truck	01
03	Hand Trolley	10
04	Computer	02

Source: Khoksa Paurashava, 2011

The institutional capacity of the Khoksa Paurashava at present is very limited. It is observed that the staff numbers are not sufficient with regards to work volume (duty and responsibility) of Paurashava. To commensurate with the modern scientific advancement the Paurashava is lagging behind in terms of logistics. Its computer facility, GIS software, use of satellite image, modern survey equipment, internet etc. are deplorable. To run the Paurashava smoothly with its multilateral function, the existing logistic support/ equipment should be improved in such a way that no function can be left.

The Paurashavas or Municipalities are classified according to financial strength/ Annual Revenue Earning by the Ministry of Local Government, Rural Development & Co-operatives. The existing classification of all municipalities and their criteria are shown in **Table 3.5**. Khoksa falls under 'C' Class Paurashava having a revenue earning of Tk.2 million by the classification of the Ministry. The statement of Holding Tax Collection for the financial year 2011-2012 was Tk. 3285000. The total earning of the Paurashava for the fiscal year 2011-2012 is Tk. 44752645 and expenditure Tk. 52582645. The details are given in **Table 3.6**.

Table 3.5: Hierarchy of Paurashavas (Municipalities)

Category of Paurashavas (Municipalities)	Annual Revenue Earning
Class-A	6 million +
Class-B	2 million
Class-C	Less than 2 million

Source: LGD, 2005

Table 3.6: Budget for the Financial Year-2011-2012

Type of Earning	Total Amount (Taka)	Type of Expenditure	Total Amount (Taka)
Revenue Earning	3285000.00	Revenue Expenditure	11115000.00
Development Earning	41467645.00	Development Expenditure	41467645.00
Total	**44752645.00**	**Total**	**52582645.00**

Source: Khoksa Paurashava, 2011

At present there are no Town Planning personnel in Khoksa Paurashava. All town planning works have been performed by the Engineering Section headed by one Sub-Assistant Engineer. At least one Town Planner is required to perform the planning works as well as guide and control physical development of the Paurashava in a planned manner. However, the existing institutional capacity of the Paurashava should be enhanced.

Map 3.1: Project Area Map of Khoksa Paurashava

3.7 Urban Growth Area

Khoksa Thana was converted into an Upazila in 1983 and the Paurashava was established on 1st February, 1997. Its present status is 'C' Class Paurashava. Since the inception of Paurashava people started to migrate from the neighboring Upazilas to Khoksa Paurashava with a view to get better urban facilities. From that time different Govt. offices have been established and at the same time business also have been expanded.

Physical growth has been taken place radially following the connecting transport networks. Till now as many as 9239 structures have been established. During delineation of Paurashava area and physical feature survey it is observed that, the physical growth is mainly preceding Janipur Bazar Road. Besides, the gradual physical growth of Khoksa Paurashava town also identified along all the transport routes.

Khoksa Paurashava area and its boundary have clearly defined by the Government through gazette notification at the time of declaration of Paurashava. In the gazette notification of 1st February, 1997 the covered area are shown by the full/part mouza maps together with individual plot numbers covering an area of 6.84 square kilometers. Our projected planning area of 6.84 sq.km discussed in the Paurashava meeting held on 24/12/19.

3.8 Catchment area

The favorable location has benefits Khoksa in two ways: it allows people to come to Khoksa to purchase goods and services, and it allows Khoksa businesses, including wholesale businesses, to deliver goods and services to places outside the town. The Khoksa Upazila HQ's provides govt. services for neighboring communities of the entire Upazila including the Paurashava area. Khoksa has four colleges and three high schools which draw students from the population in surrounding communities. The schools bring children and parents from surrounding villages and unions to Khoksa for educational and co-curricular activities. In addition to offering educational and recreational services, the Paurashava has a number of retail stores including markets, clothing, gifts, furniture, drug stores, and general merchandise stores. The town has a number of restaurants. As well, there are professional medical services such as doctors, dentists, dispensing opticians, and veterinarians in the Upazila Health Complex, which attracts people from the surrounding areas of Khoksa Paurashava. However, the influential area of Khoksa Paurashava is delineated along the transport routes.

However, the catchment area of Khoksa Paurashava is delineated along the transport routes such as Rajbari to Kushtia Road, Thana Road, Rail Station to Janipur Bazar Road. Khoksa Paurashava area and 3 (four) Union Parishads namely- Khoksa, Janipur and Samaspur of Khoksa Upazila fall under the catchment area of the town.

3.9 Land use and Urban Services

Khoksa urban center and the peripheral and fringe areas of this urban center are in continuous process of changes. As such, the land use character of the area is expected to be of non-rural in nature and found to comprise activities commensurate with urban living. The spatial structure and land use pattern of the project area have been mostly the result of natural growth. Here although a development took place during the last decade

yet the project area is still predominantly agricultural in character. Urban growth is found in mainly middle part of the project area along the both sides Janipur Bazar Road. Residential rural settlements are also found along the major roads and in almost scattered manner.

Agricultural Land Use

The major portion of land of the project area is under agricultural use. Around 982.496 acres of land of the Paurashava is under agricultural use. It appears from field survey that Ward 6 has maximum agricultural land (216.138 acres), which is 22.0% of the total agricultural land of the Paurashava. These areas have distinct rural character.

Residential Land Use

Residential use includes residential house, residential quarters, rest house, slum, mess etc. It has been appeared that Ward 2 has the most residential concentration (14.57%) while; Ward 8, 9 possesses the second position having 11.87% residential land. Ward 4 has the lowest residential concentration.

Commercial Land Use

Commercial land use mainly comprises of different types of shops (book shops, cloth shops, department stores, grocery shops, stationary shops etc.), market. katcha bazaar and other lands being used for commercial purposes. Survey result depicts that commercial activities are mainly concentrated in Ward 4, which is 29.81% of the commercial uses of the entire Paurashava. Ward 5 has the second highest commercial uses of land (18.40%).

Water body

Water body of Khoksa Paurashava mainly consists of ponds, ditches, khals, irrigation canals etc. It covers 144.988 acres of land. Ward 1 has the highest percentage (20.97%) of Water body in the Paurashava. Ward 7 has the minimum amount of water body comparing with other Wards of the Paurashava.

Circulation Network

Pucca road, Semi-pucca road, Katcha road and Rail line constitute this category of land use. Field survey reveals that highest percentage of circulation network land use is around 29.81% in Ward 4. Ward 9 has minimum amount (0.78%) of this kind of land use.

Education and Research Land Use

Land that is used for College, High School, Primary School, NGO School, Madrasha and other means of education and research are considered in this section. As survey result shows, this type of use is maximum in Ward 5 (22.20%).

Industrial Land Use

Survey revealed that Ward 1 has the highest level of land uses (39.95%) for Industrial/Processing and Manufacturing purpose. This type of uses include rice mill, saw mill, ice factory, and seed processing industry, bakery factory and other manufacturing and processing activities. It is noticed that Ward 7 has no such type of land use.

Transportation Facilities

In this category bus-truck terminal/stand, ferry ghat, rickshaw garage, passenger shed, post office, rail station, telephone exchange, ticket counter etc. are considered. According to field survey there are 0.755 acres of land in Khoksa Paurashava for this purpose.

Urban Green Space

Botanical garden, ecological park, graveyard, crematorium, historic sites etc. are included in urban green space category. There is 4.96 acres land for this type of land services in this Paurashava. Mostly this type of land use is found in Ward 6 (48.02%) then comes Ward 2 (24.04%).

3.10 Paurashava's Functional Linkage with the Regional and National Network

Regionally Khoksa Paurashava is located in Kushtia district of Khulna Division. Khoksa Paurashava is located at Middle part of Khoksa Upazilla. Gorai River bisects the Paurashava in the western side. The Paurashava as well as the Upazilla is connected within the region by both road and water ways. Mainly Road is the means of transportation but water way also acts as an important role in overall connectivity of the Paurashava. The project area is one of the important centers of economic activities within the eastern region.

Khoksa Paurashava has long cultural and trading relation with Kumarkhali, Kushtia Sadar, Mirpur, Shailkupa and Bheramara. Moreover, these areas depend on each other for various raw materials and finished products. The long established easy transportation link has brought these areas closer in terms of trade and industrial activities. A map showing the linkage of Khoksa Paurashava in the regional and national set up is shown in **Map 3.2** below.

Map 3.2: Regional Connectivity of Khoksa Paurashava

3.11 Role of Agencies for Different Sectoral Activities

Local Government Engineering Department (LGED) is one of the largest public sector organizations in Bangladesh entrusted for planning and implementation of local level and small scale water resources infrastructure development programs. LGED works closely with the local stakeholders to ensure people's participation and bottom–up planning approach in all stages of project implementation cycle. LGED promotes labor-based technology to create employment opportunity at local level and uses local materials in construction and maintenance to optimize the project implementation cost with preserving the desired quality. LGED works in a wide range of diversified programs like construction of roads, bridges/ culverts and markets to social mobilization, empowerment and environmental protection.

Roads & Highways Department (RHD) is responsible for the construction, maintenance and management of the National, Regional and Zilla road network and some bridges under the Bangladesh Government. Presently Zilla road passing through the Paurashava area is executing by the RHD department.

Implementation of Flood Control and Drainage (FCD) program and Flood Control, Drainage and Irrigation (FCDI) program falls under the responsibility of Bangladesh Water Development Board (BWDB). BWDB is playing vital role in providing flood control, drainage and irrigation facilities through construction of embankment, irrigation canals, drainage channels, bridges, sluice, regulator and other water control structures in the Paurashava vicinity as well as other areas of the country.

In Paurashava areas the DPHE solely or jointly with the Paurashava is responsible for Water Supply & Sanitation services. In addition, DPHE is responsible for assisting the Paurashavas through infrastructure development and technical assistance. To strengthen water testing facilities through establishment of laboratories, carryout Hydro-geological investigations in search of safe source of water supply and promote social mobilization for awareness rising towards proper management of water supply & sanitation infrastructure and promotion of personal hygiene practices are also some of the major responsibilities of DPHE.

The Power Development Board (PDB) supplies electricity to Khoksa from a substation located at Kushtia district. Both the PDB and Rural Electrification Board (REB) have the responsibility for distribution of electricity to Khoksa Upazilla. Out of total connections within the Paurashava the PDB has connected about 80% and rest by REB.

Ministry of Health and Family Planning provide health facilities at the upazila level including Paurashava area through Upazila Health Complex. Ministry of education is responsible for construction of educational institutions at the upazila level. The Paurashava Authority has the responsibility to provide piped water supply, construct hats/bazaar, kitchen market, auditorium, community center, street lighting and other civic amenities. Among other sectoral agencies, Department of Agricultural Extension, Fisheries Department, Veterinary Department under Upazila Parishad and Zilla Parishad, PWD, NGO's are also involved in the provision of concerned services and facilities.

The following Sectoral/Sub-Sectoral Agencies are involved in the development activities of Khoksa Paurashava (**Table 3.7**)**.**

Table 3.7: Sectoral/Sub-Sectoral Agencies of Khoksa Paurashava

Name of Agencies	Type of works done
Khoksa Upazila Parishad (through PIO)	- Construction of Pucca, Semi-pucca and Katcha Roads - Pond Excavation - Construction of earthen Embankment
Roads & Highway Dept.	- Construction of Zilla Road
LGED	- Construction of Local Roads, drains
Dept. of Public Health Engineering (DPHE)	- Provide low-cost water-sealed latrine - Piped Water Supply - Provide Tube Well (Tara pump) - Simple Hand Tube Well
Zila Parishad	- Construction of Educational Building
Bangladesh Water Development Board	- Construction of Embankment with RCC blocks, construction of Bridges/ Culvert and water control structures
PDB/REB	- Supply of electricity
Ministry of Education	- Construction of Educational Institutions
Ministry of Health and Family Planning	- Providing health facilities
Public Works Department (PWD)	- Contraction and maintenance of public buildings

Chapter 4

Projection of Future Growth by 2031

4.1 Introduction

Khoksa Paurashava is a predominantly residential town that has experienced moderate growth over the last decade. It is likely that these circumstances will substantially change over the next 20 years. However, a clear defined set of growth policies, comprehensive Master Plan and related regulations are needed to guide the Paurashava town in future development. The proposed Master Plan provides guidelines for the development of remaining vacant areas within the proposed areas within and beyond current gazetted Paurashava boundaries.

4.2 Projection of Population

The assumptions are based on past trends and the projections only indicate what may happen should recent trends continue. The trend-based assumptions remain valid. The mechanics of projecting population growth from base year data and assumed future trends of growth rate are straightforward. **Compound rate of growth method** is adopted in projecting the future population of any target year assuming a growth rate from past trends. In this method, following formula is used to compute the projected population.

$$P_n = P_o (1+r/100)^n$$

Where,

r = annual rate of growth

P_n = population in the target year

P_o = population in the base year

n = number of intermediary years

During the period 2001 to 2011, the population growth rate of Kushtia District was 1.48 in the urban area as against 1.11 in the entire district irrespective of urban and rural area. In the Khoksa Upazila the growth rate was 1.25 during the same period. However comparative growth rates at the regional and local level are presented in **Table 4.1**.

Table 4.1: Comparative regional and local growth rates

Administrative Unit		Growth Rate
Kushtia District	District	1.11
	Urban	1.48
Khoksa Upazila	Upazila	1.25
	Paurashava	-

Source: BBS 2011

The Upazila growth rate (1.25) is considered for future population projection. Following the above mentioned process, population of whole Paurashava at 5 years interval up to 2031 is presented in **Table 4.2.**

Table 4.2: Trend of Population Growth

Census Year	1981	1991	2001	2011
Total Population	2819	7986	13152	18319

Source: BBS 2001 & BBS 2011.

The Paurashava growth rate has been applied to estimate the projected population at 5 years interval up to 2031 and presented in **Table 4.3**.

Table 4.3: Projected Population of Khoksa Paurashava

Year	Population
2011	18319
2016	19493
2021	20742
2026	22071
2031	23486

The population of each ward at Khoksa Paurashava is estimated assuming 1.25 as annual growth rate. Details are provided in following **Table 4.4.**

Table 4.4: Ward wise Projected Population of Khoksa Paurashava

Ward	Population				
	2011	2016	2021	2026	2031
Ward No.01	1975	2102	2236	2380	2532
Ward No.02	2453	2610	2777	2955	3145
Ward No.03	2016	2145	2283	2429	2585
Ward No.04	1653	1759	1872	1992	2119
Ward No.05	1802	1917	2040	2171	2310
Ward No.06	1941	2065	2198	2339	2488
Ward No.07	1501	1597	1700	1808	1924
Ward No.08	2378	2530	2693	2865	3049
Ward No.09	1888	2009	2138	2275	2420
Ext. Area	712	758	806	858	913
Total	**18319**	**19493**	**20742**	**22071**	**23486**

4.3 Identification of future economic opportunities

The prospect of Economic Activities related to availability of manpower, their level of education, their income level, transport network, marketing facilities, power supply and Government policy.

In Khoksa the availability of manpower is sufficient. There are 59.8 percent population of the Paurashava within age group 16-57 years, 19.75 percent are above SSC level educated and 15.52 percent people's monthly income are above Tk. 10000/=.

Khoksa Paurashava is well connected with the neighboring district headquarters namely- Rajbari and Kushtia and also Dhaka. Its functional geographic location in the regional and national transport network is an important factor in raising the opportunities for trade and commerce.

4.4 Projection of land use

The main basis of the projection of future land uses is the projected population and the planning standard (approved by the LGED).

Since the land use categories of survey data (i.e., 19 items) and the land use categories as per approved planning standard (i.e., 13 items) are not similar, it was not possible to derive the projected land use from the extrapolation of land use categories provided in the survey data. The requirement of land was calculated based on the given standard and the projected population for the year 2031 which was presented in **Table 4.5.**

Table 4.5: Projected Landuse of Khoksa Paurashava at 10 years interval up to Year 2031

Facilities	Standard (LGED)	Existing Land of 2011 (acres)	Land Requirement for 2021 (acres)	Additional Requirement (Up to 2021)	Land Requirement for 2031 (acres)	Additional Requirement (Up to 2031)
Residential		**406.21**	**207.42**	**-**	**234.86**	**-**
General Residential	1.00 acre/ 100 pop.	406.21	207.42	-	234.86	-
Administration		**5.30**	**18.00**	**12.70**	**18.00**	**12.70**
Upazila Complex	15 acres/ Upazila HQ	5.30	15.00	9.70	15.00	9.70
Paurashava Office	3 acres/ Upazila HQ	0.00	3.00	3.00	3.00	3.00
Commerce		**23.90**	**28.32**	**7.57**	**31.33**	**7.85**
Wholesale Market	1.00 acre/ 10000 pop.	0.00	2.07	2.07	2.35	2.35
Retail sale Market	1.00 acre/1000 pop.	23.90	20.74	-	23.49	-
Neighborhood Market	1.00 acre/ Neighborhood market	0.00	4.00	4.00	4.00	4.00
Super Market	1.50 acres/ super market	0.00	1.50	1.50	1.50	1.50
Industry	1.50 acres/ 1000 pop.	**3.53**	**31.11**	**27.58**	**35.23**	**31.70**
Education		**20.19**	**34.04**	**13.84**	**37.88**	**17.69**
Primary School	2.00 acres/ 5000 pop.	7.51	8.30	0.79	9.39	1.89
Secondary School	5.00 acres/ 20000 pop.	4.38	5.19	0.81	5.87	1.49
College	10.00 acres/ 20000 pop.	7.24	10.37	3.13	11.74	4.50
Vocational Institute	5.00 acres/upazila	0.00	5.00	5.00	5.00	5.00
Others (Madrasa)	5.00 acres/ 20000 pop.	1.07	5.19	4.12	5.87	4.81
Health Facilities		**5.93**	**14.15**	**8.22**	**14.70**	**8.77**
Upazila Health Complex/ Hospital	10 acres/ Upazila HQ	5.93	10.00	4.07	10.00	4.07
Health Center/ Maternity Clinic	1.00 acre/ 5000 pop.	0.00	4.15	4.15	4.70	4.70
Open Space/ Recreation		**0.30**	**52.11**	**51.82**	**58.08**	**57.79**
Playground	3.00 acres/ 20000 pop.	0.00	3.11	3.11	3.52	3.52
Park/ Open space	1.00 acre/ 1000 pop.	0.00	20.74	20.74	23.49	23.49
Neighborhood Park	1.00 acre/ 1000 pop.	0.00	20.74	20.74	23.49	23.49
Stadium	7 acres/upazila HQ	0.00	7.00	7.00	7.00	7.00
Cinema	0.5 acre/ 20000 pop.	0.30	0.52	0.22	0.59	0.29

Facilities	Standard (LGED)	Existing Land of 2011 (acres)	Land Requirement for 2021 (acres)	Additional Requirement (Up to 2021)	Land Requirement for 2031 (acres)	Additional Requirement (Up to 2031)
Community Facilities		**11.79**	**7.67**	**3.30**	**8.28**	**3.64**
Mosque/ Temple/ Church	0.50 acre/ 20000 pop.	3.41	0.52	-	0.59	-
Eidgah	0.50 acre/ 20000 pop.	1.13	0.52	-	0.59	-
Graveyard	1.00 acre/ 20000 pop.	4.96	1.04	-	1.17	-
Community Center	1.00 acre/ 20000 pop.	0.00	1.04	1.04	1.17	1.17
Police Station	3 acres/ Upazila HQ	1.88	3.00	1.12	3.00	1.12
Fire Service Station	1.00 acre/ 20000 pop.	0.41	1.04	0.63	1.17	0.76
Post Office	0.50 acre/ 20000 pop.	0.00	0.52	0.52	0.59	0.59
Utility Services		**0.41**	**8.34**	**7.93**	**8.69**	**8.28**
Telephone/ Telegraph Exchange	0.50 acre/ 20000 pop.	0.41	0.52	0.11	0.59	0.18
Electric sub-station	1.00 acre/ 20000 pop.	0.00	1.04	1.04	1.17	1.17
Garbage Disposal	5.00 acre/ upazila	0.00	5.00	5.00	5.00	5.00
Waste Transfer Station	0.25 acre/waste transfer Station	0.00	0.75	0.75	0.75	0.75
Transportation Services		**0.00**	**4.87**	**4.87**	**5.31**	**5.31**
Bus Terminal	1.00 acre/ 20000 pop.	0.00	2.56	2.56	2.80	2.80
Truck Terminal	0.50 acre/ 20000 pop.	0.00	1.04	1.04	1.17	1.17
Tempoo Stand	0.25 acre/ 20000 pop.	0.00	0.52	0.52	0.59	0.59
Rickshaw Stand	0.25 acre/ 20000 pop.	0.00	0.75	0.75	0.75	0.75
Roads	15% of the built-up land	**0.00**	**0.26**	**0.26**	**0.29**	**0.29**
Urban Deferred	10% of the total built-up area	**41.25**	**80.01**	**38.76**	**80.01**	**38.76**
Total Area: 1690.5 acres where 124.0 acres of land is added as the extension area along with the current 1566.5 acres area.						

Chapter 5

Review of Policies, laws and Regulations

5.1 Indicative prescription of policy for Paurashava in the light of different urban policies, laws, regulations and guidelines

The policies, laws and regulations relevant to urban development and implementation of the plan is thoroughly reviewed which is summarized in the following **Table 5.1**.

Table 5.1: Review of Policies/laws/Regulations

Sl. No.	Policies/Laws/ regulations	Application	Implementation Agencies
01	The Paurashava Ordinance (2009)	Guide for the growth, development, and control of the different functions of Paurashava	The Paurashava Authority
02	National Land use Policy, 2001	Integrated planning and management of land resources	Ministry of Land
03	National Housing Policy (1993)	Physical Planning, Water Supply and Housing Sector	UDD, National Housing Authority, Ministry of Housing and Public Works
04	National Land Transport Policy (2004)	Provision of safe and dependable transport services, and improving the regulatory and legal framework	BRTA, BRTC, Ministry of Communication
05	The Environment Policy, 1992	To ensure environmentally sound development in all sectors	Ministry of Environment and Forestry
06	The Environment Conservation Rules,1997	Application relating to pollution control through issuance of Environment Clearance Certificate	Department of Environment
07	Disaster Management and Climate change Policy	Improve disaster awareness and develop disaster management plans	Ministry of Disaster Management and Relief
08	Bangladesh National Tourism Policy	To preserve, protect, develop and maintain tourism resources	Ministry of Civil Aviation and Tourism, Bangladesh Parjatan Corporation
09	Agriculture Policy	To ensure planned utilization of land	Ministry of Agriculture, Department of Agricultural Extension
10	National Forest Policy (1994)	Protection and management of resources (natural forests, protected areas, and plantations)	Ministry of Environment and Forestry, Bangladesh forest Department
11	Population Policy, 2004	Urban growth and development, Urban Migration and Planned Urbanization	Ministry of Health and Family Welfare
12	Canal and Drainage Act, 1873 (Act No. VIII of *1873)*	Preserve Natural Drainage Network through man-made canal linking with others and River	BWDB, LGED
13	The Motor Vehicles Ordinance, 1983	Control and scrutinize the movement pattern of motorized traffic	BRTA, Paurashava Authority
14	The Motor vehicle rules, 1997	Design and specification of the length and height of motorized vehicles and repair of break down vehicles	BRTA, Paurashava Authority
15	National Water Policy, 1999	Policy direction for water sector and Implementation of the	BWDB, LGED, Paurashava Authority

Sl. No.	Policies/Laws/ regulations	Application	Implementation Agencies
		Drainage and Flood Plan	
16	Industrial Policy, 2005	Setting up planned industries and discouraging unplanned industries in the light of past experience	Paurashava Authority, BSCIC, Ministry of Industry

5.2 Laws and Regulations Related to

5.2.1 Urban Development Control

The physical growth and development of Khoksa Paurashava Town is subject to control mainly by the "Local Government (Paurashava) Act, 2009" & Building Construction Act-1952 and 2004. But a very weak Development Control system has been implemented in Khoksa Paurashava. So it's spatial land use pattern has been become the haphazard, incompatible and therefore, inefficient and un-healthy.

In the past without the presence of full guideline all the development has taken place as a peach meal as per the requirement of locality/ people so a total network could not be developed. Existing road network, drain, residential houses, commercial units, industrial units etc. all are the example of such spontaneous development.

5.2.2 Paurashava Development Management

However, may be contained in the relevant ordinance/act but in practice that are not properly implemented. This is due to mainly shortage of technical man power. As per Govt. allocated organogram there should be 27 employees in Engineering Section, 26 employees in Administration Section and 22 employees in Health Section. But in practice there are only 5 employees in Engineering Section, 11 employees in Administration Section and 6 employees in Health, Family Planning and Conservation Section are presently employed in Khoksa Paurashava. Besides, there are other reasons also which are out of development management.

Chapter 6

Critical Planning Issues

6.1 Transport

In Khoksa the existing traffic and transportation infrastructures are confined mainly with the existing road network. The project area is served by 60.206 kilometers of roads. Total area covered by road network is about 23.897 acres. Out of the total length of roads 39.532 km are pucca, 9.605 km are semi-pucca and 11.069 km are Katcha.

It is very critical to by-pass the inter-upazila and inter-district traffic movement without interrupting the living environment and intra-movement pattern of the inhabitants. All the through traffics are observed to ply over the bazaar area in the central part of the Paurashava.

Commercial development occurs only in the Middle-Western part of the Paurashava. As a result, the Paurashava dwellers have to travel a long distance to buy their daily necessities which raises traffic congestion in the bazaar area and increases the travel time. The bazaar area is the most congested areas in Khoksa Paurashava. The entire area of Janipur Bazar road can be considered as congested areas.

There is no bus/truck/tempo stand or terminal provided with facilities for loading-unloading and passenger-shed. All the buses stop on the roadside generating congestion and inconvenience to both the commuters and pedestrians.

Traffic generation centers at Khoksa Paurashava are very limited. The Upazila complex and Bazar are the main Traffic generation center. Besides, different governmental offices, cinema hall, shopping centers, educational institutions, Bus Stand, Upazila Complex, Police Station, Different Educational Institutions, Different Markets, Kutcha Bazars, Hospitals, Land Office, different Govt. Offices etc. are also contributing in traffic generation.

Among all the modes the road transport is only available in Khoksa Paurashava. The transportation services are also very limited in Khoksa Paurashava. There are services both for the passengers and goods. Bus, Auto Rickshaw/Tempo, Bhodvodi, Rickshaw, Rickshaw-van, Push cart and Bi-cycle offering services for the people and Truck, rickshaw van and push cart for different goods.

There is no designated place for parking the vehicles in Khoksa Paurashava. Unfortunately there is no footpath besides any roads of the Khoksa Paurashava.

Traffic management system of Khoksa Paurashava is unorganized, backdated and poor. There is no either any traffic police or computerized signal system to manage and control the traffic. There is no lane marking and footpaths of roads. In case of any emergency or any accident the local Thana tackle the problem.

6.2 Environment

The urban environment of the Khoksa Paurashava includes both built and natural environment. Built environment includes waste management, water, air quality, energy

usage, transport network, slum improvement, and disaster mitigation. The urbanization where the built environment overburdens the natural environment cannot be sustainable. But urbanization is inevitable for countries economic growth.

The Paurashava has the thinking that operation of deep tubewells will not be cost effective as arsenic and iron free drinking water is available in almost all hand tubewells throughout the Paurashava round the year. The water table within Paurashava ranges from 10 ft to 15 ft and is lower during winter. There is no difficulty of getting drinking water in summer season from hand tube wells. The water supply within the Paurashava is mainly by hand tube wells owned by house owners. The DPHE and CARE are working with other NGOs for investigating drinking water quality.

Another critical environmental issue that can be considered in the planning process of Khoksa Paurashava is the use of chemical fertilizers and synthetic pesticides which remain persistent for a longer term. This is a serious threat to the fertility of soil leading to subsequent pollution of water after wash out through rainfall. As a result of over-utilization of these chemical fertilizer and synthetic pesticides, living of all habitats will be in serious threat that may cause the ecological imbalance and loss of biodiversity.

6.3 Land Use Control

The spatial structure and land use pattern of Khoksa Paurashava have been mostly the result of natural growth. Urban growth is found in mainly middle portion of Paurashava both the side of Janipur Bazar Road. The residential land use covers the major part (24.02 percent) of the Paurashava area. The roads inside the project area are quite narrow. The shops and different commercial establishments have followed along internal roads. Residential development occurs mainly as Ribbon Development along the existing roads. Scattered settlement pattern has been evolved in the Paurashava area since establishment of Khoksa Upazila Headquarters. As a result, vast agricultural land has been exploited through low density scattered settlement. Thus it is very difficult to take any irrigation scheme in the agricultural land and if possible the command area is less compared to a single agricultural zone. On the other hand provision of supplying any utility services in the scattered settlement is not cost effective. In this point of view land use control is a critical issue that should be considered carefully in the formulation of land use plan and zoning.

6.4 Disaster

Khoksa is not susceptible to any kind of major disaster like flood, cyclone, earthquake, Nor'westers and tornado, landslide, erosion, drought etc. Some natural hazards and calamities like flood, tornado and drought cause loss of property, livestock and agricultural production in almost every year imposing an impact on human life.

Khoksa falls under the tornado-free districts of the West-central regions in Bangladesh. Thus it is not a critical issue in the planning process.

Drought causes the depletion of ground water and soil moisture and hence damage of crops which is visible in the Northern Region of Bangladesh. Mainly agricultural drought is observed in some years which aggravate the yield of the main crops affecting food security.

Khoksa located in the West and central part of Bangladesh is the lowest active seismic zone and had experienced earthquakes of low intensity in the past. This critical issue should be considered in the planning process especially during the plan permit process regarding construction of houses, buildings, other structures and infrastructures to be built earthquake-resistant at the maximum recorded level.

The most critical issue regarding natural hazards and disaster is the flood hazard. Khoksa is not affected by annual flood.

6.5 Laws and Regulations

There is no provision in the Industrial Policy, 2005 regarding setting up of industrial estate or special economic zones to reduce environment pollution and make service provision easier. Thus it is a critical planning issue pertinent to the regulations of industrial establishment.

National Environmental Policy 1992 does not provide guidelines for controlling of pollution in all kinds of water bodies by municipal, industrial waste and toxic materials and shifting of industries from residential areas. This point is a critical issue that should be considered in the planning process of environmental management.

Vast agricultural land was incorporated in the urban area during declaration of the Paurashava without considering fertility or agricultural productivity and requirement of land for providing urban services and land uses. According to Agricultural Policy 1999, acquisition of land in excess of requirement for non-agricultural purposes will be discouraged. Thus implementation of development proposals in the light of 'Local Government (Paurashava) Act, 2009'will conflict with the Agricultural Policy 1999.

The Government of Bangladesh formulated the first ever housing policy of the country in 1993. Despite formulation of National Housing Policy 1993, no effective program and projects have been undertaken. National Housing Authority has been formed but it is yet to draw up any workable program to realize national housing policy.

The policies, laws, by-laws, acts and regulations relevant to the implementation of the Structure plan of Khoksa Paurashava are executed, exercised and implemented by different departments, ministries and authorities. There is no coordination among these departments, ministries and authorities regarding inter-related policies, laws and regulations. This is the most critical issue to be considered in formulation of the Structure Plan.

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Chapter 7

Landuse Development Strategies

7.1 Broad View of the Plan

Khoksa Paurashava is predominantly an Upazila headquarters town with emphasizing administrative functions facilitated with limited support services and agro-based small trade center meeting the community needs from the inhabitants of the Upazila jurisdiction area. Thus the Paurashava should be developed with necessary infrastructures and ancillary facilities along with provisions for planned growth of the town. In the structure plan, total area is of 1690.5 acres where 124.0 acres of land is added as the extension area along with the current 1566.5 acres area of Khoksa Paurashava.

The Structure Plan sets forth certain strategies and policies for managing growth of the town, which is anticipated to encourage the planned growth and control any unplanned growth within the Paurashava area. Strategies for land use development is formulated in such way that conform the regulations associated to the optimum use of land, ensure a sound traffic movement system and promote a livable environment. The plan also indicates certain polices for promoting the economic growth, employment opportunities for the Paurashava dwellers and upgrading the living standards of the inhabitants as a whole.

7.2 Strategies for optimum use of Urban Land Resource

The Structure Plan aims to ensure optimum use of urban land resources in the long term. The demands of almost most of the population growth within the Paurashava area other than the migrated population will be met by densification of the existing residential land in the core area. The migrated population will be accommodated in the peripheral area provided with infrastructures and necessary services. However the optimization strategies for urban land resources can be summarized fewer than two broad sub-strategies.

a) Consolidation of the Core Area

Khoksa Paurashava was established in 1st February 1997. Khoksa came into existence in 1932 as thana, and upgraded to upazila in 1983. After the establishment of upazila headquarters the vast majority of population growth occurred within the core area. This phenomenon was the result of several factors. The most dominant factor was development of infrastructures, transport and communication facilities and utility services for functioning activities of Upazila Parishad. Further population growth occurred in this area after the declaration of Paurashava in 1997 due to availability of urban services and buildable land at affordable price adjoining the Upazila Headquarters.

This sub-strategy calls for further consolidation of the existing core area in the short to medium term to optimize existing urban land resources with priority given to serviced low-density areas, vacant and under-utilized land. Policies regarding this sub-strategy are detailed in the Urban Area Plan (Land Use Plan).

b) Accelerated Development in the Peripheral Area

The area beyond the core area where a slow trend of urbanization is continuing in unplanned manner falls under this sub-strategy. Scattered settlements along the

transport network approaching the upazila headquarters have been evolved in a radial pattern. This type of settlement in the peripheral area may also be termed as ribbon development.

This sub-strategy involves adoption of policies aimed at accelerating development in the medium to long term through provision of necessary primary infrastructures in a planned way. The areas under this sub-strategy are expected to absorb by most of the migrated population from rural areas of Khoksa Upazila and other areas beyond the Paurashava. Priority will be accorded to part of Khoksa, Komlapur and Somspur area where potential areas for accelerating development is available and provision of necessary services will be to some extent cost effective. The areas to be impacted by this strategy have been shown in **Map- 7.1** (Structure Plan Map) and the policy options have been entailed in the Urban Area Plan.

Strategies shall also be implemented to consolidate the development, enhance the environment of stable areas and enhance the working, living and business environment of the core area. Areas for policy zoning were determined based on considering the existing trend of growth and optimization strategy which is shown in **Map 7.1** and in **Table 7.1** below.

Table 7.1: Policy Zoning Areas of Structure Plan

Policy Zones	Remarks	Areas (acres)	Percentage (%)
Agriculture Area	Agricultural land denotes the land suitable for agricultural production, both crops and livestock. It is one of the main resources in agriculture.	796.18	47.06
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 Landuse Plan (2011-2021) period.	111.33	6.54
Fringe Area	This zone is developing areas which will take further decades 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, beundertaken soon to enable provision when justified by increased density levels and allowed by resources.	176.22	9.57
Major Circulation	Major circulation contains major road network and railways linkage with regional and national settings.	149.64	8.85
New Urban Area	This zone will be the required additional area for future planned urban development as per population projection. Existing physical trend of growth and potential areas shall have to be considered in demarking for new urban land development.	72.85	3.13
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.	271.89	15.17
Water Body	Waterbody containing an area equals to or more than 0.15 acres excluding those of khal, irrigation canal and river will be treated as this category.	112.95	6.68
Total		**1690.507**	**100.00**

Map 7.1: Structure Plan of Khoksa Paurashava

7.3 Plans for New Area Development

The more outlying areas that are going to be urbanized spontaneously or in a planned way tend to grow very slowly. As a result, the costly infrastructure facilities and services that have to be provided are underused even lay idle for a long period. Additionally, the development is often very scattered, making provision of adequate services even more difficult.

Strategy

The Promoting Development Strategy for this urban sub area is to adopt policies which will accelerate development at the potential areas commensurating the existing physical trend of growth. This will release the population pressure from the core area, accommodate population growth in the long term up to the 2031 and ensure planned development. The purpose of this policy is to optimize the utilization of these extensive, but scattered and underutilized lands, at the same time promoting further outward, planned urban growth. The areas selected under this strategy are part of part of Khoksa, Komlapur and Somspur. Details are shown in **Map- 7.1**.

- **Policy NAD/01- New Area Development**

To promote land subdivision of the selected area and provide necessary infrastructure and services in a planned way.

Implementing Agency: Khoksa Paurashava, LGED, PDB, REB, DPHE, NGOs

Justification

Fringe areas under slow development offer excellent opportunity for planned development by means of land subdivision and infrastructure development.

Means of Implementation

Land acquisition should be done through the initiative of Paurashava Authority, then land preparation, land subdivision, earthwork will be furnished. New facilities and services like road, drains, footpath, waste transfer station and other civic services will be provided by involving the concerned agencies. Involvement of public sector along with private sector and NGO's or PPP (Public Private Partnership) may be an innovative concept for financing in this respect.

7.4 Areas for Conservation and Protection

Historic preservation is an endeavor that seeks to preserve, conserve and protect buildings, objects, landscapes or other artifacts of historical significance. In Khoksa there are very minor things to be count under conservation and protection. However, the heritage sites of any archaeological and historical importance should be preserved and conserved following the proper planning procedure. The natural landscape including river, khal, lake, large ponds should be protected from encroachment, misuse or any other human intervention. The productive agricultural land should also be protected from converting it into unproductive urban land. The relevant policies regarding the conservation and protection of these sites are formulated as follows.

- **Policy CP/01- Preserve and conserve the heritage sites**

To preserve the heritage sites in the Paurashava area without any change and conserve with controlled modifications and alterations.

Implementing Agency: Paurashava, Department of Archeology, Bangladesh Parjatan Corporation

- **Policy CP/02- Protect the Natural Landscape**

The ponds with area more than 0.15 acres, lakes, canals, river, beels must be protected as water body from encroachment and conversion into other use. The permission for filling up of these ponds should not be given without any special case. These water bodies (112.952 acres) should be protected for the purpose of using them as retention pond and drainage channel.

Implementing Agency: Paurashava, LGED, BWDB

- **Policy CP/03- Protect the Productive Agricultural Land**

The high value agricultural land should be protected from conversion into inefficient and unproductive urban land. These areas will be conserved and promoted as areas of high intensity food production in order to ensure urban food security in close proximity to the town and improve the income level within agricultural sector of the Paurashava' s economy.

Implementing Agency: Paurashava, DoE, Department of Agricultural Extension

Chapter 8

Strategies and Policies for Sectoral Development of the Paurashava

8.1 Socio-economic Sectors

8.1.1 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. So it is necessary to enhance population control drive. Grassroots level workers can play very 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 creation of awareness about small family size.

The existing (2011) and projected (2031) population of Khoksa Paurashava are 18319 and 23486 respectively. The working population is considered as the population of 15-59 years of age. The number of population able to work at present is 10955 and this figure is anticipated to rise at 14044 up to year 2031. 16.50% of the present workforce is currently employed in various economic sectors. If the current trend continues, 87.13% of the total projected workforce that is 12236 more employment should be provided for complete eradication of unemployment problem from the Paurashava. The following table shows detail in this regard.

Table 8.1: Projection of Workforce

Category	Existing (2011)	Projected (2031)	Employed Population		Employment Required	
			No.	% Workforce	No.	% Workforce
Total Population	18319	23486	1808	16.50	12236	87.13
Workforce (15-59)	10955	14044				

The existing gross population density of Khoksa Paurashava is 11 persons per acre and it is expected that if the plan is implemented properly the density will rise at 14 persons per acre at the end of the plan period (Year 2031).

Strategy-1:

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

Policy:

Item	Executing Agency
Popu/1: Declare population as one of the most critical sectors of national development	✓ Ministry of Planning, ✓ Ministry of Health and Family Planning
Justification: Per capital 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 living standard of the people.	
Popu/2: Put more efforts and resources in raising the level of education.	✓ Ministry of Planning, ✓ Ministry of Health and Family Planning ✓ Ministry of ducation.
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 pay that would reduce poverty, which is a major source of large family.	
Popu/3: Create well-paid and well-trained grassroot level family planning workers for motivational work.	✓ Ministry of Planning, ✓ Ministry of Health and Family Planning,
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 well paid and efficient.	

Strategy-2:

Ensure rational distribution of population all over the planning area to control and regulate population growth and density.

Policy:

Item	Executing Agency
Popu/4: Encourage people, especially the migrated people, through arrangement of awareness building program to settle them in the peripheral and fringe area	✓ Ministry of Planning, ✓ Ministry of Health and Family Planning ✓ Khoksa Paurashava
Popu/5: Provide urban services to the peripheral area to enhance settlement in this area	✓ Khoksa Paurashava

8.1.2 Economic Development and Employment Generation

Economic development of any place is associated with generation of employment. And 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 Khoksa as it is a very small town with a very low level of population. Besides, it has to compete with other adjoining urban centers like, Shailkupa, Mirpur, Bheramara and larger towns like Kushtia and Rajbari. These urban centers are counter magnets of investment.

Strategy:

Creating basic sector investment climate and lead the local economy forward through promotion of Small and medium Enterprise (SME).

Policy:

Item	Executing Agency
Econ/1: Provide bank loans on easy terms to attract prospective investors in the SME sector.	✓ Ministry of ndustries ✓ Ministry of Commerce
Justification: Easy loans would Encourage and attract prospective investors for investment in small scale industries.	
Popu/2: Take measures to channelize remittance to value adding productive sectors.	✓ 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 channelized to productive sectors to help create more employment.	
Popu/3: Arrange entrepreneurship training programs for prospective investors.	✓ Ministry of Industries ✓ Ministry of Commerce
Justification: There are many potential investors who are ignorant of the ways and means of investment and. Operating an enterprise The training can help them get educated in these lines.	

8.1.3 Housing and Slum Improvement

As the town has low level of population, housing is yet to become a problem here. Housing policy and programs are provided and executed by the national government. There is no local office of the National Housing Authority to execute housing programs 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 is highly lacking. The projection of housing unit is shown in **Table-8.2**.

Table 8. 2: Projection of Housing

Category	Base Year (2011)	Projected (2031)
No. of Population	18319	23486
No. of Families	4264	5467
Housing Demand	**1203**	

It is observed that 1203 no's of housing unit is required for accommodation of the anticipated growth of population.

No slums are observed in this small town, the way they are exposed in large cities. Therefore, no slum and squatter related problems are there in the town.

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 landowners in housing area development on public-private partnership basis will be encouraged.

Policy:

Item	Executing Agency
Policy House/1: Provide all necessary services and facilities to promote housing at private sector.	✓ Ministry of LGRD ✓ Khoksa Paurashava
Justification: It is more difficult to provide housing on public sector initiatives as it involves funding, land acquisition, takes long time. By providing infrastructure and services, general people can be enabled to build their own houses.	
Policy House/2: The land owners of housing area can be involved in a participatory development technique where Paurashava will provide infrastructure and the cost will be shared by land owners.	✓ Ministry of LGRD ✓ Khoksa Paurashava

8.1.4 Social Amenities and Community Facilities

Social amenities and community facilities include education facilities, health facilities, open space recreation facilities, like, park and play ground, amusement park, community center. 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 goods. For education and health facilities national government has policies and there are separate ministries and their agencies to execute the policies through programs and projects. There are also upazila level offices of the concerned agencies to take care of the national education and health policies and programs execution. For providing amenities like, park and play ground, community center 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. For community center intensive use of land should be made by making multiple use of same space. For example, providing community center, ward commissioner's office, clinic or any other use in the same building.

Strategy:

Exploring khas/ public land within Paurashava and catching the unused/ vacant land for providing amenities before density of population increases and land becomes scarce and dear.

Policy:

Item	Executing Agency
Policy-Amenity/1: Procurement of khas and other public land for park, playfield, community center.	✓ Ministry of LGRD ✓ Khoksa Paurashava
Justification: Since above facilities are non-revenue earning, they should be procured at least cost.	
Policy-Amenity/2: Procure land for open space facilities as quick as possible, because when land value will be higher cost of providing the facilities will also	✓ Ministry of LGRD ✓ Khoksa Paurashava

Item	Executing Agency
be very high. 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.	

8.1.5 Tourism and Recreational Facilities

Khoksa Paurashava is lagging behind the sites of historical importance or recreational facilities to attract the tourists from different places of Khoksa Upazila and the surrounding areas. However the suitable location of the Paurashava in regional transport network connecting only the Kushtia district headquarter make it important to attract tourists from the neighboring and outlying areas. Following strategy and the relevant policies may be taken for improvement of tourism sector and providing recreational facilities in the Khoksa town.

Strategy:

Enhance the tourism and recreational facilities through provision of hotel/motel facilities, improvement of transport and communication facilities, ensuring public safety and security, establishment of tourism center equipped and provided with trained work force and development of new tourist/picnic spot.

Policy:

Item	Executing Agency
Policy-Tourism/1: Improvement of road network and introduction of comfortable and convenient bus service.	✓ RHD, LGED, BRTC ✓ Khoksa Paurashava
Justification: This will encourage and attract the tourists to come into the Paurashava and thereby visit the important sites in and around the Paurashava	
Policy-Tourism/2: Setting up and develop tourist resort provided with proper landscaping and recreational facilities, rest house, hotels and motels	✓ Bangladesh Parjatan Corporation ✓ Khoksa Paurashava
Justification: It will create interest in tourism among the people	
Policy-Tourism/3: Ensuring security of both life and assets of the tourists	✓ Khoksa Thana ✓ Khoksa Paurashava
Justification: The tourists will be assured of their life and belongings in visiting to the Paurashava area	

8.1.6 Safety and Security

Safety and security is a fundamental right of all citizens of Bangladesh as per provision of the constitution. Bangladesh Government has the responsibility to ensure safety and security to all the citizens. However, having conformed to the constitutional provision there may be certain strategy and policy prescription in the structure plan to ensure safety and security to the Paurashava dwellers.

Strategy:

Ensure public safety and security from fire, accident, hijacking and other threats through prevention and rehabilitation measures.

Policy:

Item	Executing Agency
Policy-Safety & and Security/1: Expansion of the existing fire station or construction of a new, larger facility to replace the existing one. If the existing fire station is not enlarged, it would be prudent to find a central location for the new fire station, so that it will be possible to provide a rapid response to incidents.	✓ Department of fire service and civil defense ✓ Ministry of state affairs ✓ Khoksa Paurashava
Justification: Loss of lives and property of the Paurashava inhabitants will be minimized.	
Policy-Safety & and Security/2: Enhance the capacity of the fire service station with more trained personnel, modern equipment of fire extinguishing and vehicles equipped and ready for firefighting at any time.	✓ Department of fire service and civil defense ✓ Ministry of state affairs ✓ Khoksa Paurashava
Justification: Loss of lives and property of the Paurashava inhabitants will be minimized.	
Policy-Safety & and Security/3: Reduce the risk of accidents and traffic conflicts at a minimum level by introducing automated signal system, proper traffic sign and symbol, road marking and other traffic management measures. Besides, arrangement of awareness building program may be an effective measures in this respect.	✓ Khoksa Thana ✓ Police Department (Traffic) ✓ Khoksa Paurashava
Justification: The probability of accident and the subsequent health hazard, loss of lives will be reduced.	
Policy-Safety & and Security/4: Hijacking, terrorist attack, robbery etc. will be wiped out by strict enforcement of law. The police department will play active role as a constant vigilant. The community leaders may also take actions in this issue.	✓ Khoksa Thana ✓ Khoksa Paurashava
Justification: Improved public safety will help to maintain the character of the community	

8.2 Physical Infrastructure Sector

8.2.1 Transport

By far, transport is the most important means to revitalize an urban center. lntra and inter 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-district road network will have to be created that makes movement faster and easy. With good infrastructure transport on the road will be forthcoming. 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-city communication for easy transportation of goods and passengers.

Policy:

Item	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) ✓ Deputy Commissioner, Kushtia
Justification: Not only that communication is needed between urban centers, but to attract transport movement emphasis must be laid on quality of roads built.	
Policy-Transport/3: Development of local road network through participatory approach	✓ Khoksa Paurashava ✓ Local Government Engineering Department (LGED)
Justification: Development of roads will involve huge cost. Participatory development will enable cost sharing, which will reduce cost of road construction substantially.	

8.2.2 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 including water supply, solid waste management, power supply, sanitation and drainage. Except power supply, the rest are the responsibility of 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.

Policy:

Item	Executing Agency
Policy-Utility/1: Exploration of alternative sources of water to ensure sustainable supply.	✓ LGED ✓ Khoksa Paurashava
Justification: Amid constant rise of urban population, it is time to explore alternative sources of water, like, rain water harvesting and surface water supply.	
Policy-Utility/2: Involve beneficiary participation in solid waste management.	✓ Khoksa Paurashava ✓ NGO and CBO
Justification: Involvement of beneficiaries in solid waste management will make the operation more effective and reduce financial responsibility of the Paurashava.	
Policy-Utility/3: Exploring re-use and recycling of waste materials to extract resources.	✓ Khoksa Paurashava ✓ NGO and CBO
Justification: Re-use and recycling of waste materials will produce resources and reduce cost of waste management.	
Policy-Utility/4: Publicity on the benefits of hygienic sanitation to motivate people and enable people to have easy access to sanitary materials.	✓ LGED ✓ Khoksa Paurashava ✓ NGO and CBO
Justification: Motivation will encourage people to adopt healthy sanitation and reduce health risks.	
Policy-Utility/5: Protection of natural drainage system and preparation of hierarchical	✓ LGED

Item	Executing Agency
drainage network.	✓ Khoksa Paurashava
Justification: Natural drainage systems are being grabbed and filled up, which increases the risk of water logging. Well planned hierarchical drainage network help smooth drainage of storm and waste water.	

8.2.3 Flood Control and Drainage

The Khoksa Paurashava is free from internal flood. Flood caused by overflow of river water is called the external flood, while that caused due to lack of the drainage facilities is called the internal flood. Most of the drains of Khoksa Paurashava have been constructed in an unplanned way without considering proper outfalls as piece meal, no proper size and gradient has been maintained. Those drains shall have to be excavated further downstream and to be linked them with the khals so that the runoff can recede freely. The existing khals shall have to rehabilitate with proper section and gradient so that they can function properly as primary drains that are sufficient to carry the total runoff of the Paurashava. For man-made primary drains, secondary and tertiary drains these khals shall be their outfalls. Besides, there are a number of ponds and ditches which can be utilized as water retention ponds for retaining the storm runoff generated from rainfall and hence reducing the vulnerability to internal flood.

Strategy:

The Town should be protected from external flood.

Policy:

Item	Executing Authority
Policy–Flood Control/1: Construction of embankment wherever necessary.	✓ BWDB ✓ Ministry of ✓ LGRD ✓ Khoksa ✓ Paurashava
Justification: To save the life and property of people during external flood.	
Policy-Utility/5: Protection of natural drainage system and preparation of hierarchical drainage network.	✓ LGED ✓ Khoksa ✓ Paurashava
Justification: Natural drainage systems are being grabbed and filled up, which increases the risk of water logging. Well planned hierarchical drainage network help smooth drainage of storm and waste water	

8.3 Environmental Issues

8.3.1 Natural Resource

The Khoksa Paurashava is not endowed with many natural resources that can be conserved. Among the meager natural resources it has are, Gorai River (2.34 km), 559 no's of ponds and ditches (165.87 acres) and one natural khals. Out of the natural resources, all khals should be vested to Paurashava by the Ministry of Land for proper maintenance and also for the community interest. This will help prevent encroachment and un-authorized filling of natural khals and beels.

Strategy:

The river and all khals should be vested with Paurashava for use in community interest.

Policy:

Item	Executing Agency
Policy-Nature/1: The river bank and all khas land within Paurashava must be assessed and Handed over to the Paurashava for use in community interest.	✓ Ministry of Land ✓ Khoksa Paurashava
Justification: This will prevent misuse of river bank and khas land.	
Policy-Nature/2: The river bank and all khals within Paurashava must be vested with the Paurashava for maintenance and proper use as drainage channel.	✓ Ministry of Land ✓ NGO and CBO
Justification: This will help prevent unauthorized occupation and filling of natural drainage.	

8.3.2 Sanitation

There is no sewerage network in the Khoksa Paurashava, only there are few sanitary latrines with septic tank and soak pit. The Paurashava claims that they have achieved to bring 100% of its population under sanitation coverage. There are 4264 households in Khoksa Paurashava. 7% of its population have sanitary latrine with septic tank and soak pit, rest usages semi pacca latrines. The DPHE and Paurashava are the main implementing agencies for sanitation projects whereas the UNICEF, WORLD VISION, and other NGOs are their co-partners in different sanitation programs.

Strategy:

All households of Khoksa Paurashava should be provided with hygienic sanitation facilities.

Policy:

Item	Executing Agency
Policy-Sanitation/1: Septic tank, soak well and low-cost sanitation to be provided.	✓ Ministry of Public Health ✓ Khoksa Paurashava
Justification: This will provide a proper hygienic sanitation of Khoksa Paurashava.	
Policy-Sanitation/2: All the households are to be facilitates with sanitation facilities.	✓ DPHE ✓ NGO and UNICEF, WORLD VISION, BRAC, Proshika, etc.
Justification: This will help the deprived households.	

8.3.3 Hazard

In Khoksa Paurashava natural hazards can be identified into storm, cyclone, nor'wester, tornado, flood, earth quake etc. The frequency of the Norwesters is maximum in April, whereas there are a few in May and minimum in March. The Norwesters and Tornadoes cause uproot trees, telephone and electricity lines, loss of human life and biodiversity, injury of life, damage and destruction of property, damage of cash crops, disruption in lifestyle, damage to essential services, and national economic loss.

From rainfall data of Khoksa from year 1988 to 2007, the calculated mean annual rainfall stands 2569 mm. Every year the Khoksa Paurashava is either partly or fully inundated by flood.

Strategy:

All preventive measures and pre-disaster preparedness, rescue & evacuation operation during disaster and post-disaster relief & rehabilitation are to be adopted.

Policy:

Item	Executing Agency
Policy-Hazard/1: Natural khals and river are to be preserved as a discharging point (outfall) of drainage water and necessary embankment to be constructed.	✓ BWDB, LGED ✓ Khoksa Paurashava
Justification: This will reduce flood water and facilitate the discharging process.	
Policy-Hazard/2: All physical structures (including houses) should be designed in such a way so that it can resist/prevent any natural hazard.	✓ Khoksa Paurashava
Justification: Structures with raised plinth level and earthquake resistant design can reduce loss of human life, damage and destruction of property.	
Policy-Hazard/3: Establishment of new flood shelter and develop the educational institutions as a place of shelter during devastating flood hazard.	✓ Ministry of Education ✓ Disaster Management Bureau ✓ Khoksa Paurashava
Justification: This will reduce the loss of lives and property caused by flood.	
Policy-Hazard/4: Provision of rescue and evacuation operation during severe flood	✓ Bangladesh Army ✓ Fire service and civil defense ✓ Police department ✓ Khoksa Paurashava
Justification: This will reduce the loss of lives and property caused by flood.	
Policy-Hazard/5: Arrangement of post disaster relief and rehabilitation program will be undertaken	✓ Disaster Management Bureau ✓ Ministry of food and disaster management ✓ Khoksa Paurashava
Justification: The flood affected people will be able to overcome from the hazard within very short time.	

8.3.4 Environmental Aspects (Air, Water, Soil, etc. Quality)

A review of ambient environmental trends in Bangladesh showed that suspended particulate matter exceeded ambient standards in all major cities in Bangladesh. The suspended particulate matter problem is most acute in the highly populated and industrial areas. The major sources of suspended particulate matter are re-suspended road dusts (mostly coarse particles from construction activities), vehicular emissions (mostly fine pnb 0.3 articles) and industrial sources like brick kiln and cement factories. Fortunately those are very minor scale in Khoksa Paurashava.

Protection and preservation of the natural environment is essential for sustainable development. Given that most of the country's environmental resources are linked to water resources, it is vital that the continued development and management of the nation's water resources should include the protection, restoration, and preservation of the environment and its bio-diversity including wetlands, mangrove and other national forests, endangered species, and the water quality. Accordingly, water resource management actions will take care to avoid or minimize environmental damages.

The soil consists of active natural levee, flood plain, sand bar, point bar sediments composed of naturally low to medium compact sandy silt, sandy clay, organic clay, loose sand, depression and abandoned channel sediments.

Strategy:

The environment comprising air, water and land should be enhanced and promoted.

Policy:

Item	Executing Agency
Policy-Air/1: Air pollution should be reduced through banning of two-stroke three wheelers, introduction of high-rise chimneys in the industries	✓ BRTA, DoE ✓ Khoksa Paurashava
Justification: This will reduce the amount of CO, CO_2, SPM, lead and other heavy metals, harmful chemicals which are injurious to health.	
Policy-Water/2: Protection, restoration and preservation of water resources and reduction of pollution should be done.	✓ DoE, DPHE, BWDB ✓ Khoksa Paurashava
Justification: This will restrain the natural drainage system, ecology, biodiversity of the Paurashava and will ensure clean and livable environment.	
Policy-Soil/3: Soil pollution should be minimized though reduction of chemical fertilizer, synthetic pesticides and introduction of rotations in the farming system.	✓ Department of Agricultural Extension, Upazila Parishad ✓ Khoksa Paurashava
Justification: This will enhance soil fertility resulting high crop yield and reduce water pollution.	

Chapter 9

Implementation Issues

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

9.1 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 Local Government (Paurashava) Act, 2009 needs to be revised and more power should be given to the Executive Officer for appointment of employees.

It can not 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 can not 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 can not 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 Khoksa 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.

9.2 Staffing and Training

As a traditional system of the Paurashava, engineer and secretary are appointed directly by the Ministry of Local Government, Rural Development and Cooperative and other staffs are appointed locally through the approval of the Ministry after the advertisement on the newspapers. In Khoksa 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 can not deliver proper service to the citizens. Besides, most of them are not qualified enough to render proper services.

9.2.1 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.

9.2.2 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.

9.2.2.1 Institutional Framework

To rearrange the institutional framework for the Paurashavas recently the government has made a committee to reform the organogram of all the Paurashavas of Bangladesh. According to the clause no. 72-78 (Paurashava Officer & staff, provident fund etc.) of Paurashava Act, 2009 and on the basis of the type and category of works, the committee suggested appropriate section/units/divisions within the Paurashava framework. Planning unit or division will be necessary to set sequentially as the authority can perform it's mandatory responsibility 'town development and control' well and serve the inhabitants presently as well as in the future. The planning unit/division may have some sections that are as follows:

Planning unit/Division: a) IT Section

b) Planning Section

c) Beautification and recreation Section

According to the division and its relevant sections, what so ever appropriate with the necessity and capacity over time, it is recommended to set up necessary manpower for each category of Paurashava. Possible scope of proposed planning unit/division is given bellow.

Figure 9.1: Scope of Work for Planning Division

9.2.2.2 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.

Khoksa is a 'C' class Paurashava. For the 'C' 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 constrains 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 Progamme (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 Poura 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 atleast 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 perform 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 Center at Paurashava premises.
- Meet the Mass people of Poura-Parishad.

9.2.3 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.

9.2.4 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.

9.2.5 Financial Issues

Governance in Khoksa 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 Local Government, Rural Development 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 Khoksa 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 asses 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, Khoksa 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.

9.2.6 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 Khoksa 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. However, plan evaluation can be accomplished by means of out sourcing as and when it is required.

9.2.7 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 Khoksa Paurashava. There is no town planner in the Paurashava, review and updating of the Master Plan will require service of senior level planners that Paurashava might be able to provide. But more planners is needed for this Paurashava. 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 4^{th} year of the plan period and will come into execution from the 5^{th} 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.

9.3 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.

9.4 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 10

Urban Area Plan

10.1 Introduction

The second tier of UTIDP master Plan package of Khoksa Paurashava is the Urban Area Plan followed by the Structure Plan. The Urban Area Plan (UAP) consists of the following plans: Land Use Plan, Transportation and Traffic Management Plan and Drainage & Environmental Management Plan and Plan for Urban Services. Part-B of the Report entails the objectives, purpose and the role of Urban Area Plan and its relation with Structure Plan and the planning standard. The development plan proposals and land use zoning provisions are envisaged in The Urban Area Plan in the light of policy prescriptions of Structure Plan for a medium term (2011-2021).

10.2 Content and Form of Urban Area Plan

The Urban Area Plan covers existing urban area of Khoksa Paurashava and has a ten years time-frame from 2011 to 2021. It comprises Part-B of the explanatory report supported by necessary maps.

The Urban Area Plan is concerned only with the area where the greatest change is expected in the medium term (10 years). For this area, it indicates how the Structure Plan policies might be pursued whilst also giving greater precision to the spatial dimension of the policies.

The outline of the Urban Area Plan gives guidance to the Paurashava as to how it can develop the roles i.e. to promote development, to co-ordinate development and to control development The Urban Area Plan has been divided into four main parts. These are preceded by four introductory chapters which explain the scope of the report and provide background to the Urban Area Plan including its relationship with the Structure Plan.

Part-B of the report starts with the Land use Plan. The Land use Plan identifies approaches of planning, existing and projected land use and proposed land use. Requirement of land for different purposes, land use zoning and plan implementation strategies are also included here.

The Transportation and Traffic Management Plan includes existing conditions of transportation facilities, intensity of traffic volume, degree of traffic congestion and delay, analysis of existing deficiencies, travel demand forecasting for next 20 years, future traffic volume and level of services and transportation development plan. Moreover, transportation system management strategy and plan implementation strategies are also presented in this plan.

Drainage and Environmental Management Plan is the third chapter of the Urban Area Plan. The chapter again subdivided into two parts- Drainage Plan and Environment Management Plan. Existing drainage network, land level and topography, plan for drainage management and flood control and plan implementation strategies are the components of the drainage plan. Existing environmental condition, solid waste and

Garbage disposal, environment pollution, water logging, natural calamities and localized hazards, plan for environmental management and pollution control and plan implementation strategies are the key issues of the environment management plan.

Fourth part of this report is Plan for Urban Services. Existing condition and demand of the Services, projection on existing and proposed Urban Services, Proposals for Urban Services and Implementation, monitoring and evaluation of the Urban Services Plan are the key issues of this part.

10.3 Area of Urban Area Plan

The Paurashava area of Khoksa as per gazette notification is considered as the area of Urban Area Plan. This area is the same as the Structure Plan area or planning area. The Urban Area Plan of Khoksa Paurashava covers an area of 1690.35 acres that is 6.84 sq.km. The total Paurashava area has been regarded as the area of Urban Area Plan since the Paurashava Authority has the responsibility of providing basic urban services and facilities in the entire jurisdiction area.

10.4 Function of Urban Area Plan

Urban Area Plan is prepared for managing and promoting development over medium terms following the broad guidelines set by the longer term Structure Plan. It shows the urban structure of sub- system in space over the medium term and identifies broad programs of direct action especially related to infrastructure development, institutional issues as well as broad financing strategies. The plan may also outline more specific area-wise development policies to guide development over the medium terms, one major objective of preparing Urban Area Plan is the consolidation of development activities by various agencies in areas that have strongest potential for growth in the medium term and can accommodate the anticipated volume of growth. Other purpose of preparing Urban Area Plan is to facilitate the development control function. It shows the broad land use zones on a more detailed scale of maps as derived from Structure Plan.

10.5 Duration and Amendment of Urban Area Plan

The duration of Urban Area Plan (Land Use Plan, Transportation and Traffic Management Plan, Drainage and Environmental Management Plan and Urban Services Plan) of Khoksa Paurashava will be 10 years and that will remain valid till 2021 AD. A new Urban Area Plan will replace the current plan after its validity to be expired in 2021. The next plan will remain valid for rest of Structure Plan period. Mid term revision of the plan should be carried out during the 4th year (2016) of the plan period. However, any amendment of the plan can be carried out any time on public interest.

Chapter 11
Land Use Plan

11.1 Introduction

This is the first chapter of Part- B that starts with Land Use Plan of Urban Area Plan. Land use plan covers the existing and projected land uses of urban area of the Paurashava. It lays down the land use policies, guidelines and proposals including land use zoning plan. It also states the plan implementation strategy at the town level.

The land use plan, a major component of Urban Area Plan, is an official document with legal backing, consisting of a report and necessary maps prepared by the consultant, which sets forth major policies to guide the physical development of the town. The land use plan is prepared by the consultant for a specified time period, following the full development of Paurashava considering the existing land uses and future demand of the area and population. It will interpret the Structure Plan proposal and policy. The future land uses, zoning, land development regulations for the future probable population have been indicated through land use plan.

11.1.1 Goals and Objectives

The broad goals of land use plan are to create an urban space for habitation with comfort, a livable urban environment for economic flourishment and social cohesion and to ensure the optimum and conforming use of land in the built-up areas and its immediate surroundings, potential for development. Urban Area Plan aimed at interpreting the long-term broad policies and guidelines of Structure Plan over the medium term (10 years) is composed four components, as such Land Use Plan, Traffic and Transportation Management Plan, Drainage and Environmental management Plan and Plan for Urban Services. Thus, Land Use Plan is one of the major components of UAP providing land use policies, strategies and guidelines in the urban growth areas of Khoksa Paurashava. Major objectives of Land Use Plan of Khoksa Paurashava can be summarized as follows:

- Consolidate the Core Area to accommodate most urban growth within next 10 years (2011-2021).
- Promote mixed-use development (mainly Residential-Commercial) in the built-up area permitting compatible uses.
- Develop the central area as a commercial hub for higher order commercial activities.
- Promote several growth centers for the least developed areas to meet only the local needs.
- Locate the industrial area apart from residential areas with better transportation access in order to ensure better living environment.
- Encourage new development to be innovative and to protect natural and cultural resources.

- Where possible, promote land preservation through conservation easements and sound development practices.
- Encourage the land best suited for agriculture to remain agricultural
- Encourage more dense residential and commercial development in the existing built-up areas.

11.1.2 Methodology and Approach to Planning

Landuse Planning starts with the collection of information on existing landuse derived from landuse survey indicating the use of each plot by its functional quality such as residential, industrial, commercial, health service etc. Total Station and DGPS survey technique was used for land use survey.

Spatial and attribute data of all existing landuses from landuse survey was processed and stored under a comprehensive GIS database component. GIS software such as PC ArcView and PC ArcInfo (Version as suggested in the ToR) has been used for processing of physical feature survey data. Data was stored in WGS-1984 format (latitude, longitude, ellipsoidal height in meter) and later on, it was projected and stored in Lambert Conformal Conic (LCC) projection system.

The survey team carried out the land use survey simultaneously with topographic and physical feature surveys. Most land use information were collected during physical feature survey through personal inquiry of the building/space users. Land use information was extracted from survey according to use of land by its functional activity such as residential, commercial, industrial etc. Each survey feature was recorded with individual ID or Code. A detailed land use category with their user ID selected by the coordination of different experts of consulting groups and approved by LGED was followed for land use survey. The land use features were identified, classified and separated in different layers during data processing stage. The existing land use map was prepared indicating the broad categories of land uses on the RS Mouza map at a scale of 1:1980 as per ToR.

Based on the existing landuse map, the landuse plan was prepared according to the guidelines given by the ToR. The planning starts from formulation of strategies to issues like functional quality (meeting of space requirements for different functions, relation between functions etc., aesthetic quality, flexibility, deviation, public agency support etc.) for plan implementation. The planning in detail also covers the delineated existing urban area and the new urban area.

The formulation of Landuse Plan involves the following systematic approaches:

At the **First phase** of the planning process, review of previous plans and higher-level plans concerned with the development of Khoksa Paurashava area was tried to find. But no higher level plan was found for the Paurashava.

The **Second phase** of the process comprises formulation of planning principles and standards addressing the landuse, infrastructures and utility services. This is an important stage in design process, crucial to the final functional quality of the result and its efficiency and cost effectiveness. These planning principles and standards address two distinct situations: existing urban area and new urban areas.

Population projection based on analysis of the growth trend from previous Censuses (1981-2011) was performed in the **Third phase**. In projecting the future population of the target years at two distinct phases (2011-2021 and 2021-2031), Compound rate of growth method was adopted assuming a growth rate from past trends.

At the **Fourth phase**, land requirements for each specific land uses was determined based on projected population for a cycle of 10 years up to 2031 and the recommended Planning Standards approved by the PMO of LGED. After estimating land requirements, tentative allocation of specific land use proposals was made based on land suitability analysis and was drafted on base map.

The **Fifth phase** of the planning process involves conducting public consultation meeting with local communities / beneficiaries and other agencies / interest groups (stakeholders). Views and ideas regarding proposed uses resulting from the consultation meeting held on 15/11/2012 among all the stakeholders involved with the development of the Paurashava area was then summarized and incorporated in this report as an explanatory report as well as a fourth overlay on the base map.

At this stage, a land suitability analysis was performed on a qualitative basis through field visits, consultation meeting, analysis of topographic map, physical feature map and soil condition to justify the suitability of land for a specific use. Land allocation is a process which depends on the demand and supply of land. Whereas land suitability yields information on supply, land requirements indicate demand of land available for development. Final land allocation or land use recommendation for competing uses was then shown on proposed land use plan map and described in detail in the explanatory report.

The consultants formulated an integrated Landuse Plan at the Sixth phase. The integrated Landuse Plan was formulated through the consolidation of inputs from different sectors, local leaders, interest groups, etc. At the same time assessment was made on future economic, social and environmental impact of the integrated plan and its financial viability.

Finally, the development proposals of the plan have been prioritized and phasing out.

11.1.3 Delineation of Planning Areas

In the preparation of Master Plan the ToR assigns the delineation of Planning Area. During the survey work, planning area has been delineated. In the delineation of planning area, the area of Paurashava as declared in 1st February 1997 by gazette notification was considered. The total Planning area covered 6.84 square-kilometers. It included 8 Mouzas with full and partial plot numbers.

Once the Paurashava area as per gazette notification was determined, the planning area was then delineated based on systematic procedure.

At the next step, the trend of growth of the Paurashava area for the last 30 years was determined along with assessing the potentiality of the adjoining area. Therefore, based on the existing area of Paurashava and assessing the trend of growth and potentiality through intensive survey, the necessity for probable extension of the existing area was determined in consultation with the representatives of the Paurashava. The planning area was discussed in the Paurashava monthly meeting held on 24/12/2008. It was discussed in the meeting that the existing area of the Paurashava covers an area of 6.84 sq.km,

most of which is agricultural and rural in nature. As, this area is sufficient enough to accommodate the future growth for the next 20 years and the adjoining area is not so potential, it was decided in the meeting led by the Mayor to continue the prevailing area of the Paurashava without any extension.

Thus the existing Paurashava area and few extension areas have been considered as the Planning area in the formulation of Structure Plan, Urban Area Plan and Ward Action Plan. The Paurashava area and planning area has been finalized as 6.84 sq.km with the extension area. The delineation of planning area was supported by the minutes of the Paurashava meeting and is shown in **Map 3.1**.

11.1.4 Content and Form of Landuse Plan

The Landuse Plan covers existing urban areas of Khoksa Paurashava and its immediate surroundings and has a ten years time-frame from 2011 to 2021. It also comprises a report and a map. The planning map depicts the proposed land use, zoning, infrastructure development and other development proposals. Report elaborates all the proposals made in the plan including rules, regulations and recommendations for implementation of the plan.

Part-B of the report starts with the Landuse Plan. The Landuse Plan identifies approaches of planning, existing and projected landuse and proposed landuse. Requirement of land for different purposes, landuse zoning and plan implementation strategies are also included here.

11.2 Existing and Projected Land Use

11.2.1 Introduction

The spatial structure and land use pattern of project area have been mostly the result of natural growth. Here although a development took place during the last decade yet the project area is still predominantly agricultural in character. Urban growth is found in mainly middle part of the project area. Residential rural settlements are also found along the major roads and in almost scattered manner in the peripheral area. The residential land use covers the major part (24.03 percent) of the project area while a major portion of land of the project area is under agricultural use (58.10 percent). The roads inside the project area are quite narrow. The shops and different commercial establishments followed along internal roads.

The most driving factors of landuse change is the income of the people, government policy, new establishment like industry, higher level educational institute, construction of road and embankment and availability of services. Radical change of landuse in the Paurashava is not found. Before it known as Paurashava, agricultural domination was the key landuse. During last ten years, the landuse scenarios remain same. The broad categories of land uses of the project area are presented in **Table 11.1**.

Table 11.1: Existing Land use

SL. No.	Land Use	Area in Acres	% of Area
01	Agricultural	982.069	58.10
02	Circulation Network	41.249	2.44
03	Commercial Activity	23.897	1.41
04	Community Service	3.406	0.20
05	Educational Facility	20.195	1.19
06	Forest Area	0.000	0.00
07	Governmental Services	19.783	1.17
08	Manufacturing and Processing Activity	3.533	0.21
09	Miscellaneous	0.021	0.00
10	Mixed Use	4.785	0.28
11	Non Government Services	0.945	0.06
12	Recreational Facilities	0.296	0.02
13	Residential	406.212	24.03
14	Restricted Area	0.000	0.00
15	Service Activity	8.297	0.49
16	Transport & Communication	0.753	0.04
17	Urban Green Space	4.962	0.29
18	Vacant Land	25.190	1.49
19	Water Body	144.756	8.56
Total		**1690.35**	**100.00**

Source: Land Use Survey by DDC, 2008-2009

Map 11.1: **Existing Land Use Map of Khoksa Paurashava**

11.2.2 Analysis and projection on existing and proposed land uses

Khoksa Paurashava has not been evolved as an ideal township. The Paurashava was declared with an area of vast agricultural land focusing built-up land in the Upazila Headquarters only. Growth of population is the natural trend and at the same time, expansion of non-agricultural use on agriculture land is also natural tendency of the people. This unplanned, scattered and horizontal development will be controlled by promoting certain policy prescriptions and proper planning proposals emphasizing compact township concept. Vertical development can also be encouraged and introduced in order to optimize urban land resource and minimize the misuse of valuable agricultural land.

Khoksa Paurashava exhibits both rural and urban characteristics. Rural characteristics relate to the drivers of the economy through agricultural linkages. Urban characteristics may relate to the role of light industry, small business and service activity in the economy but are more often linked to living conditions as a function of density and changing social systems as a reflection of increased diversity. Agro-based economy is proposed to retain in the landuse plan and a certain percentage of existing agricultural land is proposed to continue farming practice. However, provisions for encouraging non-agricultural activity are made to enhance the living standard of the Paurashava inhabitants as well as to raise the economic base of the Paurashava as a whole. General industrial zone, heavy industrial zone and commercial zone of a considerable amount of land are proposed to allocate in the landuse plan with a view to accelerate non-agricultural activity.

Proposed landuse of Khoksa Paurashava is projected based on the projected population and Planning Standards for UTIDP provided by LGED after finalization through several consultation meeting with the consultants. Proposed landuse is projected for the target year 2021 and 2031. As such, the time frame of Urban Area Plan is 10 years, 2021 is considered as the target year for implementation of the landuse plan. Following the planning standard of UTIDP, projected landuse of Khoksa Paurashava has been calculated and shown in **Table 11.2**.

Table 11.2: Projected Landuse of Khoksa Paurashava

Facilities	Standard (LGED)	Existing Land of 2011 (acres)	Land Requirement for 2021 (acres)	Additional Requirement (Up to 2021)	Land Requirement for 2031 (acres)	Additional Requirement (Up to 2031)
Residential		**406.21**	**207.42**	**-**	**234.86**	**-**
General Residential	1.00 acre/ 100 pop.	406.21	207.42	-	234.86	-
Administration		**5.30**	**18.00**	**12.70**	**18.00**	**12.70**
Upazila Complex	15 acres/ Upazila HQ	5.30	15.00	9.70	15.00	9.70
Paurashava Office	3 acres/ Upazila HQ	0.00	3.00	3.00	3.00	3.00
Commerce		**23.90**	**28.32**	**7.57**	**31.33**	**7.85**
Wholesale Market	1.00 acre/ 10000 pop.	0.00	2.07	2.07	2.35	2.35
Retail sale Market	1.00 acre/1000 pop.	23.90	20.74	-	23.49	-
Neighborhood Market	1.00 acre/ Neighborhood market	0.00	4.00	4.00	4.00	4.00
Super Market	1.50 acres/ super market	0.00	1.50	1.50	1.50	1.50

Facilities	Standard (LGED)	Existing Land of 2011 (acres)	Land Requirement for 2021 (acres)	Additional Requirement (Up to 2021)	Land Requirement for 2031 (acres)	Additional Requirement (Up to 2031)
Industry	1.50 acres/ 1000 pop.	**3.53**	**31.11**	**27.58**	**35.23**	**31.70**
Education		**20.19**	**34.04**	**13.84**	**37.88**	**17.69**
Primary School	2.00 acres/ 5000 pop.	7.51	8.30	0.79	9.39	1.89
Secondary School	5.00 acres/ 20000 pop.	4.38	5.19	0.81	5.87	1.49
College	10.00 acres/ 20000 pop.	7.24	10.37	3.13	11.74	4.50
Vocational Institute	5.00 acres/upazila	0.00	5.00	5.00	5.00	5.00
Others (Madrasa)	5.00 acres/ 20000 pop.	1.07	5.19	4.12	5.87	4.81
Health Facilities		**5.93**	**14.15**	**8.22**	**14.70**	**8.77**
Upazila Health Complex/ Hospital	10 acres/ Upazila HQ	5.93	10.00	4.07	10.00	4.07
Health Center/ Maternity Clinic	1.00 acre/ 5000 pop.	0.00	4.15	4.15	4.70	4.70
Open Space/ Recreation		**0.30**	**52.11**	**51.82**	**58.08**	**57.79**
Playground	3.00 acres/ 20000 pop.	0.00	3.11	3.11	3.52	3.52
Park/ Open space	1.00 acre/ 1000 pop.	0.00	20.74	20.74	23.49	23.49
Neighborhood Park	1.00 acre/ 1000 pop.	0.00	20.74	20.74	23.49	23.49
Stadium	7 acres/upazila HQ	0.00	7.00	7.00	7.00	7.00
Cinema	0.5 acre/ 20000 pop.	0.30	0.52	0.22	0.59	0.29
Community Facilities		**11.79**	**7.67**	**3.30**	**8.28**	**3.64**
Mosque/ Temple/ Church	0.50 acre/ 20000 pop.	3.41	0.52	-	0.59	-
Eidgah	0.50 acre/ 20000 pop.	1.13	0.52	-	0.59	-
Graveyard	1.00 acre/ 20000 pop.	4.96	1.04	-	1.17	-
Community Center	1.00 acre/ 20000 pop.	0.00	1.04	1.04	1.17	1.17
Police Station	3 acres/ Upazila HQ	1.88	3.00	1.12	3.00	1.12
Fire Service Station	1.00 acre/ 20000 pop.	0.41	1.04	0.63	1.17	0.76
Post Office	0.50 acre/ 20000 pop.	0.00	0.52	0.52	0.59	0.59
Utility Services		**0.41**	**8.34**	**7.93**	**8.69**	**8.28**
Telephone/ Telegraph Exchange	0.50 acre/ 20000 pop.	0.41	0.52	0.11	0.59	0.18
Electric sub-station	1.00 acre/ 20000 pop.	0.00	1.04	1.04	1.17	1.17
Garbage Disposal	5.00 acre/ upazila	0.00	5.00	5.00	5.00	5.00
Waste Transfer Station	0.25 acre/waste transfer Station	0.00	0.75	0.75	0.75	0.75
Transportation Services		**0**	**4.87**	**4.87**	**5.31**	**5.31**
Bus Terminal	1.00 acre/ 20000 pop.	0.00	2.56	2.56	2.80	2.80
Truck Terminal	0.50 acre/ 20000 pop.	0.00	1.04	1.04	1.17	1.17
Tempoo Stand	0.25 acre/ 20000 pop.	0.00	0.52	0.52	0.59	0.59
Rickshaw Stand	0.25 acre/ 20000 pop.	0.00	0.75	0.75	0.75	0.75

Facilities	Standard (LGED)	Existing Land of 2011 (acres)	Land Requirement for 2021 (acres)	Additional Requirement (Up to 2021)	Land Requirement for 2031 (acres)	Additional Requirement (Up to 2031)
Roads	15% of the built-up land	**0.00**	**0.26**	**0.26**	**0.29**	**0.29**
Urban Deferred	10% of the total built-up area	**41.25**	**80.01**	**38.76**	**80.01**	**38.76**

11.2.3 Summary showing distribution of land for existing and proposed land uses

Residential Land Use

The existing total acreage under residential use has been found to be 406.2 acres. Residential uses are mostly concentrated on central part of Paurashava area. The projected population of the Paurashava is expected to be 20742 in the year 2021 and 23486 in the year 2031. The net density of population is at present 45 persons/acre which is very low compared to the planning standard. If the current trend of population continues, the projected net density is anticipated as 51 persons/acre in the year 2021 and 58 persons/acre in 2031 which is sufficient enough to meet the future housing requirements based on planning standard. So it is found that no additional land is required for residential development. The increasing demand of land for residential development is recommended to be met by the densification of existing areas through vertical development and compact township concept to ensure the optimum use of land.

According to the planning standards of UTIDP provided by LGED, the density of population (net density) is recommended to be 50-100 persons/acre for general residential use. The projected residential land is 207.42 for 2021 and 234.86 for 2031 which is lower than the existing residential land. The existing residential area is proposed to be splited into two distinct types of residential uses e.g. Urban Residential Zone (286.550 acres) and Rural Settlement (86.746 acres). A considerable amount of residential land (30.764 acres) has been designated as mixed use where some other compatible activities (e.g. light commercial, light industrial) are observed and expected to continue.

Commercial Land Use

The commercial activities have been occupied 23.897 acres of land in the project area, which is insufficient covering only about 1.41 percent of the total land. Considering planning standards and projected population it is notified that 28.32 acres of land is required for commercial development. It includes wholesale market, retail sale market, corner shops, neighborhood market that will accelerate trade and commerce of the Paurashava.

Due to scarcity of land in the built-up part, it was not possible to follow the standard; total 29.011 acres of land has been newly proposed in addition to the existing commercial land. 3 nos of Neighborhood markets comprising 2.682 acres of land, 1 (one) wholesale market of 3.997 acres land and 2 (two) Super Markets of 1.693 acres land is proposed as commercial land use.

Water body

The third highest existing land use category is water body. In all 144.756 acres of land are covered by water bodies which represents about 8.56 percent of the project area. Water bodies include river, ponds, ditches, beel and khals. Major water bodies of the area are the ponds and ditches which are distributed scatteredly all over the project area. The existing water bodies, which have an area more than 0.25 acres is proposed to be retained for functioning of water body as detention pond of storm runoff and thereby mitigation of rainfall induced flood vulnerability.

Agricultural Land Use

The major portion of land of the project area is under agricultural use. Total land under agricultural use is 982.069 acres which is 58.10 percent of the land. Ward No.1, Ward No.2, Ward No.3, Ward no. 6 and Ward No.9 rank high in terms of agricultural use of land. These areas have distinct rural character. Agricultural land of 795.603 acres, which is 47.06 percent of the total land, is proposed to continue the current agricultural trend and the remaining land is proposed to be shifted in industrial/manufacturing, commercial, service or some other non-agricultural uses.

Urban Deferred

There is no land in the Paurashava which can be termed as urban deferred. Agricultural land having potentiality for development comprising 42.243 acres of land which is nearly 10% of built-up area as per standard has been proposed. Urban deferred land is proposed for the provision of urban development in future.

Circulation Network

Current Circulation Network occupies 2.44 percent land of the project area. Total area under this use amounts to 41.249 acres. The main circulation network is road and rail transportation. The projected area for circulation network use is estimated as 80.01 acre, which is nearly 15% of the total built-up area. The projected area of circulation network was not followed properly in the provision of land allocation for circulation network. The proposed use of circulation network is 149.649 acres of land. The reason behind this anomaly is that in practice more roads have been proposed to ensure connectivity and accessibility among the localities.

Education and Research Land Use

Educational Facility occupied 1.19 percent of the project area that covered 20.195 acres of land. Educational Institutions were generally Kindergarten, Government and Non-Government Primary School, High Schools, College, Madrasha, Computer Training Institute, Tutorial Coaching Center etc. The proposed area for education and research land use is 28.415 acres comprising of about 1.68% land of the total project area.

Industrial Land Use

Manufacturing and Processing land use occupies 3.533 acres of land and which is only 0.21 percent of the total land of the project area. Rice mils are the main industry of Khoksa Paurashava which covers almost full part of this category. As per standard (1.50acres/ 1000 population), 35.32 acres of land is required for industrial activity. An industrial zone of 34.7 acres of land comprising general (17.84 acre) and heavy industry (16.95) acres is

proposed for advancement of industrial activity and generation of employment opportunity for the Paurashava inhabitants.

Transportation Facilities

A total of 0.753 acres of land are occupied by Transportation facilities. For provision of transportation facilities including bus terminal, bus stand and rickshaw/van/tempo stand, passengers' shed, ghat, helipad, filling station, CNG station, mobile tower/transmission center, railway station a total of 3.371 acres of land is proposed for such type of facilities.

Open Space (Outdoor Recreation)

The existing land under open space, designated as urban green space at the survey stage, is 4.962 acres covering 0.29 percent of the total area. 30.681 acres of land is proposed for outdoor recreation to serve the projected population up to year 2031 reserving open land with a view to sustain hydrological processes as well as. It includes central park, children's park, playground and other outdoor recreational facilities.

Recreational Use (Indoor Recreation)

Presently there are two cinema halls in the Paurashava area with 0.296 acres of land which may be considered as sufficient enough to meet the requirement of such purpose. According to planning standard, further 0.59 acres of land is projected for future use up to year 2031. However, no further area is proposed for this use.

Health Services

Presently 5.928 acres of land is used for Health services in the Paurashava. According to planning standard, total 14.70 acres of land is projected for future use up to year 2031. However, the Doctor's residential areas are not counted in health services landuse according to landuse category provided the PMO. So, Upazila HQ have sufficient land to support the Paurashava. Furthermore, three community hospitals are proposed within the Paurashava with 2.004 acres of land.

Utility Services

The existing land under utility services is 0.409 acre, which is not sufficient. According to planning standard, total 8.69 acres of land is projected for future use up to year 2031. Total 7.929 acres of land is proposed for Utility services to serve the projected population up to year 2031. It includes public toilets, waste disposal ground and waste transfer stations.

Community Facilities

Currently 3.406 acres of land is used as community facilities. According to planning standard, total 8.28 acres of land is projected for future use up to year 2031. Total 8.508 acres of land is proposed for community facilities to serve the projected population up to year 2031. It includes community center, Eidgah and graveyard.

Mixed Use

Some mixed use zone has been proposed in the adjoining areas of proposed in core area and other functionally important areas where co-existence of more than one compatible land uses is anticipated by the planning team. This co-existence of land uses is requisite to ensure a livable urban environment as well as a means of income generating activities for the Paurashava dwellers. A total of 30.641 acres of land has been proposed as mixed use

zone at different locations of the planning area. Mixed use zone will accommodate mainly residential use along with light commercial or some other activities compatible with living environment of the locality.

Eight Ward Centre is proposed in eight wards of Khoksa Paurashava (except Ward 7) with 5.749 acres of land. It is defined under mixed use zone, because it will serve as community centre, community clinic as well as administrative purposes of respective Councillors.

Government Office

Being an Upazila Headquarters, Khoksa Paurashava accommodates almost all the government offices necessary for proper functioning of the Upazila as an administrative center as well as providing government services to the inhabitants of the entire Upazila. The Paurashava authority has been continuing its administrative functions. However, the Paurashava do not have own office building. Thus 0.628 acres of land has been proposed in Ward 7 for Paurashava Office Complex.

Miscellaneous

Other categories of uses which do not fall under the classified 23 types of land uses have been designated as miscellaneous use. NGO office, vacant land etc. falls under this category. An area of 13.385 acres that is 0.79% of the total area has been designated as miscellaneous use.

11.2.4 An estimate on the requirement of land for different uses

The requirement of land for different uses were estimated based on Planning Standards for UTIDP provided by the PMO Office of LGED and the projected population for up to the year 2031. The forecasted areas for each specific use were calculated through spreadsheet analysis (Microsoft Excel 2007) Software and further summarized into category wise land requirement for the 2021 and 2031, which was presented in **Table 11.2**.

Table 11.3: Proposed General Land Use

Sl. No.	Landuse Type	Remarks	Area (acre)	Percentage (%)
01	Agricultural Zone	Agricultural land denotes the land suitable for agricultural production, both crops and livestock.	796.183	47.06
02	Circulation Network	Road and Rail communication	149.649	8.85
03	Commercial Zone	The land used for commercial activities is considered as commercial land use. Commercial land includes established markets and areas earmarked for markets.	29.011	1.72
04	Community Facilities	All community facilities including funeral places and other religious uses	8.508	0.50
05	Education & Research Zone	All kinds of educational institutes	28.415	1.68
06	General Industrial Zone	Green and Orange A categories as per The Environment Conservation Rules, 1997	17.841	1.06
07	Government Office	All Government Offices	21.635	1.28
08	Health Services	All Hospitals, clinics and diagnostic center	8.100	0.48
09	Heavy Industrial Zone	Other toxic and pollutions Industries (Orange B	16.954	1.00

Sl. No.	Landuse Type	Remarks	Area (acre)	Percentage (%)
		and Red categories as per the Environment Conservation Rules, 1997)		
10	Miscellaneous	Any other categories, which are not related to other 23 categories	13.385	0.79
11	Mixed Use Zone	Mixed land use refers to the area without a dominant land use or, multiuse	30.641	1.81
12	Open Space	Playground, Botanical Garden, Stadium, Zoo etc.	30.681	1.81
13	Recreational Facilities	Indoor based facilities with designated building structure i.e. Cinema Hall, Theater Hall etc.	0.294	0.02
14	Restricted Area	Where no one but certain people can enter, i.e. Electric Sub-Station, Fuel Reserve Depot, Gas Transmission, Cantonment etc.	-	-
15	Rural Settlement	Rural settlement includes the low dense residential area, which is scattered and rural in nature.	86.746	5.13
16	Transportation Facilities	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.	3.371	0.20
17	Urban Deferred	Urban reserved area for future development	42.243	2.50
18	Urban Residential Zone	It includes high dense residential area	286.550	16.95
19	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.	7.929	0.47
20	Beach	Sea Beach	-	-
21	Forest	Designated Forest Area	-	-
22	Overlay Zone	Undefined Zone	-	-
23	Historical & Heritage Site	The entire mentionable historical and heritage site	-	-
24	Water Body	Equal or More than 0.25 acre and justification by the consultant and wet land will merge with water body	112.952	6.68
Grand Total			**1690.507**	**100.00**

11.3 Land Use Proposals

11.3.1 Introduction

The land use proposals are the result of the goals, land use analysis, and policies set forth in this document. Land suitability analysis defined which areas may be more suitable for each specific development. The urban growth areas delineate which areas are planned for future urban development. The recommendations of land use plans are generally followed within the urban growth areas. Other areas of potential residential, commercial, or industrial development are designated in key locations.

Mixed use, such as commercial and residential either shared within the same building or in close proximity, may become more common. The composition of development is largely determined by the market forces of supply and demand. The Paurashava has many acres of open, undeveloped land, and all future development will be dependent on this supply of developable land. Land supply is restricted by the ability to provide utilities and transportation services.

11.3.2 Designation of Future Land Use

Future Land Use is proposed for the next 20 years up to 2031 i.e. within the time frame of Urban Area Plan. The specific future land uses for Khoksa Paurashava Town will be at least 24 different types which can be shown in **Table 11.3** above. The proposed specific land uses were designated based on public consultation meeting with the stakeholders and land suitability analysis which is shown in **Table 11.3** (Proposed Specific Land Use) below. After that proposed general land use map was prepared and the details are shown in **Table 11.4** (Proposed general Land Use) and **Map 11.2** (Land Use Plan Map) below. Detailed plot schedule of Proposed Land Use has been listed in **Appendix-B**.

Map 11.2: Land Use Proposal for Khoksa Paurashava

Table 11.4: Proposed Specific Land Use

ID	Proposal	Location	Ward No.	Area	Mouza	Plot no.
BT	Bus Terminal	At the middle of the Paurashava; beside Rajbari-Kushtia Road	Ward 3	1.213	Khoksa	2161-2164, 2227, 2228, 2230-2233, 2250
C	College	At the middle of the Paurashava	Ward 8	4.230	Kamalapur	286, 312-318, 344, 345, 349, 364, 366-380, 394-396, 398-401
CM	Cattle Market	West side of the Paurashava	Ward 2	1.196	Khoksa	1312-1314, 1400, 1401, 99999
CP	Central Park	Near Kamalapur Road	Ward 7	9.307	Kamalapur	255-278, 286-300, 305-312
Hos-1	Hospital (Community)	Beside Matpara Road	Ward 4	0.453	Khoksa	1461, 1740, 1741, 2713, 2752, 2754
Hos-2	Hospital (Community)	At the South side of the Paurashava	Ward 9	0.470	Kamalapur	755-757, 764
Hos-3	Hospital (Community)	At the north side of the Paurashava	Extension Area 1	1.081	Samaspur	1578, 1579, 1581-1585, 1587-1592, 1610
HS	High School	Near Peteldanga Road	Ward 2	2.893	Khoksa	684, 704, 706-719, 737-739, 741-743
IZ-1	Industrial Zone	Beside Peteldanga Road	Ward 1	16.042	Khoksa	382-384, 386, 389-422, 426, 470-487, 572, 1062, 99999
IZ-2	Industrial Zone	Beside Peteldanga Road and Station to Janipur Bazar Road	Ward 1	16.077	Khoksa	415-418, 421-431, 433, 440-475, 567, 568, 572
					Buzruk Mirzapur	579, 580, 594-600, 605-619
LIH	Low Income Housing	Beside Kamalapur Road	Ward 7	7.433	Kamalapur	48-53, 60, 63-92, 94, 1717
NM-1	Neighborhood Market	Beside Peteldanga Road	Ward 2	0.933	Khoksa	294, 672-675, 679-684
NM-2	Neighborhood Market	South side of the Paurashava	Ward 8	0.999	Kamalapur	317, 347, 349, 370
NM-3	Neighborhood Market	Near Rail Station	Extension Area 1	0.750	Samaspur	1566, 1569, 1570, 1572-1574, 1578
NP-1	Neighborhood Park	Beside Peteldanga Road	Ward 1	2.442	Khoksa	327-334, 486-500
NP-2	Neighborhood Park	Near Matpara Road	Ward 4	2.465	Khoksa	1426, 1433, 1434, 1436-1438, 1441, 1443-1447, 1452
NP-3	Neighborhood Park	At the North side of the Paurashava	Extension Area 1	1.985	Samaspur	1578-1581, 1592-1594
PB	Paurashava Building	Near Kamalapur High School	Ward 7	0.628	Kamalapur	213
Pg	Playground	Beside Kalibari Road	Ward 4	1.517	Khoksa	1487, 1489-1494, 1497, 1507, 1513, 1571-1574
PS-1	Primary School	Beside Kalibari Road	Ward 4	1.180	Khoksa	1487-1492, 1513, 1573, 1574, 1705
PS-2	Primary School	In front of Shahi Talamul Quran madrasha	Ward 8	0.528	Kamalapur	561, 668, 708, 710-712
PT-1	Public Toilet	Near Rail Station	Extension Area 1	0.107	Samaspur	2092, 99999
PT-2	Public Toilet	Near Peteldanga Road	Ward 2	0.092	Khoksa	684, 703, 704
PT-3	Public Toilet	Beside Rajbari-Kushtia	Ward 2	0.164	Khoksa	852

ID	Proposal	Location	Ward No.	Area	Mouza	Plot no.
		Road				
PT-4	Public Toilet	Near Station to Janipur Bazar Road	Ward 3	0.187	Khoksa	2317
PT-5	Public Toilet	Near Bazar Area	Ward 5	0.195	Khoksa	2415, 2436, 2437, 2448
PT-6	Public Toilet	Beside Station to Janipur Bazar Road	Ward 6	0.097	Khoksa	390, 2614
PT-7	Public Toilet	South side of the Paurashava	Ward 8	0.085	Kamalapur	348, 723
RZ	Resettlement Zone	At the middle of the Paurashava	Ward 6, 7	6.801	Kamalapur	1-5, 9-20, 22-30
					Khoksa	2649, 2677-2687
SH	Slaughter House	Near Bazar Area and Gorai River	Ward 4	0.357	Khoksa	1587, 1591-1595, 1606, 1612, 99999
SM-1	Super Market	Near Bazar Area and Gorai River	Ward 4	1.040	Khoksa	1578, 1579, 1585, 1586, 1595-1597, 99999
SM-2	Super market	At the middle of the Paurashava	Ward 6	0.653	Khoksa	2669-2676, 2733
St	Stadium	Near Kamalapur Road	Ward 7	7.736	Kamalapur	29-49, 53-63, 65, 87, 104-119, 151, 853
TS-1	Tempu Stand	Beside Train Station to Janipur Bazar Road	Ward 1	0.237	Samaspur	2185, 2186, 2251
TS-2	Tempu Stand	Beside Train Station to Janipur Bazar Road	Ward 3	0.351	Khoksa	1856, 1885, 1886
TS-3	Tempu Stand	Beside Thana Road	Ward 6	0.356	Khoksa	2391, 2605-2609
TT	Truck Terminal	Beside Rajbari-Kushtia Road	Ward 2	0.886	Khoksa	805-808, 839-841, 843-845, 852
VI	Vocational Institute	At the middle of the Paurashava	Ward 5, 6 & 7	0.818	Kamalapur	1
					Khoksa	2538-2541, 2672, 2673, 2677
WC-1	Ward Centre	Beeside Station Road	Ward 1	1.065	Buzruk Mirzapur	25, 26, 30, 99999
WC-2	Ward Centre	Near Rajbari-Kushtia Road and behind Upazila Complex	Ward 2	1.297	Khoksa	1359, 1789, 1792, 1793
WC-3	Ward Centre	Near Rail Station to Janipur Bazar Road	Ward 3	1.144	Khoksa	1884-1893, 1904, 2104, 2714
WC-4	Ward Centre	Beside Kalibari Road	Ward 4	0.539	Khoksa	1575, 1580-1584, 1705
WC-5	Ward Centre	Beside Thana Road	Ward 5	0.385	Janipur	10, 19, 20
					Khoksa	2508-2512
WC-6	Ward Centre	At the middle of the Paurashava	Ward 6	0.277	Maligram	414, 417, 418, 1795
WC-7	Ward Centre	At the South side of the Paurashava	Ward 8	0.315	Kamalapur	355, 356, 554-559
WC-8	Ward Centre	At the South side of the Paurashava	Ward 9	0.727	Kamalapu	757-759, 764, 811
WDG	Waste Disposal Ground	At the East side of the Paurashava	Ward 6	6.486	Maligram	612-632, 634, 643, 650-669, 671, 673, 776, 1789, 1802
WM	Wholesale Market	Near Rajbari-Kushtia Road	Ward 2	3.997	Khoksa	798-802, 804-816, 820, 822, 823, 838, 839, 841

11.3.3 Land use Zoning

Zoning is a device of land use planning used by local governments in most developed countries. The word is derived from the practice of designating permitted uses of land based on mapped zones which separate one set of land uses from another. Zoning may be use-based (regulating the uses to which land may be put), or it may regulate building height, lot coverage, and similar characteristics, or some combination of these. Combinations of zoning designations can also be applied to the same area.

Zoning is the process of planning for land use by an executing agency/Paurashava to allocate certain kinds of structures in certain areas. Zoning also includes restrictions in different zoning areas such as, a) height of buildings, b) density (number of structures in a certain area), c) use of lots, green space etc. According to these above criteria following 3 (three) types of zoning regulations can be exercised in the land use planning.

a) Height Zoning

The height zoning provides height limits for structures and objects of natural growth and standards for use of an area, which encourage and promote the proper and sound development of areas. It is also applicable to height restrictions for flight safety around airports or other similar purposes.

Maximum allowable height of buildings is determined based on relation between ground cover of buildings and the land parcel that house it, minimum setback of building from the adjoining plot boundaries and the maximum floor area that can be constructed in relation to plot size and the connecting road.

As there is no airport/ Helipad in the Paurashava vicinity and population density is very low compared to the built-up cities and towns, there should not be any height limit of buildings for Khoksa Paurashava. However, in order to ensure habitable urban environment maximum allowable height should be determined based on setback, building bulk, allowable FAR (Floor Area Ratio) and width of the adjacent road.

b) Density Zoning/ Bulk Zoning

Density Zoning can be defined as the zoning ordinances that restrict the average number of houses per acre that may be built within a particular area, generally in a subdivision. Density based zoning assigns a total permissible number of residential units that may be built on any given parcel of land using a base density plus environmental criteria to establish the numbers of residential units the land can reasonably accommodate.

Bulk zoning regulations restrict the density in a given area through a variety of building-specific measures, including floor-area-ratio (FAR), setback requirements, and open space requirements. Such provisions are separate from use-based zoning regulations, which restrict the type of use permitted in a given area, such as residential, industrial, or commercial.

Khoksa Paurashava is an Upazila level agro-based town where rural homesteads are prevalent and most of the houses are katcha and semi-pucca. Density Zoning/Bulk zoning regulation is not applicable for this town with low population density and scattered development.

c) Use Zoning

The primary purpose of use zoning is to segregate uses that are thought to be incompatible. In practice, this zoning is used to prevent new development from interfering with existing residents or businesses and to preserve the "character" of a community.
Detail permisable landuse categories have been illustrated in **Appendix-C**.

11.4 Plan Implementation Strategy

11.4.1 Land Development Regulations to implement the Land use Plan

Effective implementation of a plan is the most important part of the planning process. This chapter highlights various measures needed to be taken in order to implement the land use plan proposals.

Implementation of the Land use Plan depends on successful pursuit of the policies specified in the Structure Plan. Those policies represent a significant challenge face with the responsibility of planning and managing the development of the Paurashava area. However, at present no authority is responsible for planning and managing physical development activities in the Paurashava and no regulation except 'Local Government (Paurashava) Act, 2009'for controlling physical development. This poses a serious constraint to the implementation of the Land use Plan and in fact, any development plans.

Prior to introduction of the regulations, to implement the land use plan Legislative involvement is recommended here:

1. Impose control on all type of buildings in the Paurashava according to the setback rules prescribed in the Building Construction (Amendment) Rules, 1996 (Notification No. S.R.O. No. 112-L/96). Building permission for extended areas shall be according to the land use provision prescribed in the plan. Any permission for building construction, front road width shall not be less than 16 ft. and the construction must follow the Building Construction (Amendment) Rules, 1996.
2. To control the air, water, noise and soil pollution, Conservation of Environment and Pollution Control Act, 1995 (Act No. I of 1995) was enacted. In the Paurashava, there is no authority for enforcing the provisions prescribed in the said Act. The pollution related with the implementation of land use component may be controlled with this Act.
3. Haphazard development of commercial activities is the general scenario of the Paurashava. It is necessary to impose control on commercial activities provisioned in the Shops and Establishments Act, 1965 (Act No. VII of 1965).
4. In case of man-made canal, regulations prescribed in the Canal and Drainage Act, 1873 (Act no. VIII of 1873) is the best weapon. For the linking of canal with others and river considering drainage facilities the Act may be enforced.
5. For the conservation of archeological monuments or structures or historical development the Ancient Monuments Preservation Act, 1904 (Act no. VII of 1904) may be enforced. Archeological Department of Bangladesh and Paurashava authority through a partnership process may preserve such type of development.

6. To control air pollution due to brick burning with the establishment of brick field, Brick Burning Control Ordinance, 1989 (Ordinance No. VIII of 1989) is the appropriate regulation. The Paurashava authority may enforce this Ordinance with the authorization given by the government to him.

7. To control the medical practitioner, establishment of private clinics and pathological laboratories, the statute named Medical Practice, Private Clinics and Laboratories (Regulation) Ordinance, 1982 (Ordinance No. IV of 1982) was enacted. For efficient enforcement of the Ordinance, the Paurashava authority' may execute the Ordinance with the authorization of government.

8. The Paurashava will have to exercise strictly Playfield, Open space, Garden and Natural Tank in Urban Areas Preservation Act, 2000 (Act No. XXX VI of 2000) to some specially important areas like, riverfront and water bodies, drainage channels, low land below certain level, designated open space, etc. Development restrictions are needed around security and key point installations. The provision of restriction will strengthen the power of the plan to safeguard its development proposals and landuse provisions.

9. The government is authorized for establishment of hat and bazar with the acquisition of land through the statute named Hat and Bazar (Establishment and Acquisition) Ordinance, 1959 (No. XIX of 1959). In case of private hat and bazar, a management body is being empowered through the Bangladesh Hats and Bazars (Management) Order, 1973 (P.O. 73/72). The Paurashàva authority is also empowered establishing hat and bazar in his jurisdiction through the "Local Government (Paurashava) Act, 2009". Coordination may be framed among the government (Upazila Parishad), Paurashava and private owner for the establishment, development and management of the hat and bazar located in the Paurashava premises.

10. In the Paurashava premises, industrial development is controlled by the Bangladesh Cottage Industries Corporation through Bangladesh Cottage Industries Corporation Act, 1973 (Act No. XXVIII of 1973), Industrial Development Corporation through East Pakistan Industrial Development Corporation Rules, 1965 (No. EPIDC/ 2A-2/63/354) and Factory Inspector through Factories Act, 1965 (Act No. IV of 1965). Locational aspects and issuing of trade license is controlled by the Paurashava authority. A joint coordination cell among those four authorities may control the establishment of factories and industries in the Paurashava.

11. In the Paurashava, for rain water harvesting, some specific ponds / tanks will needed to be preserved. A number of derelict tanks may be improved through tank improvement project and in this case Tanks improvement Act, 1939 (Act No. XV of 1939) will support the Paurashava is regulatory aspects.

12. Except Khas land, a considerable amount of public land in the Paurashava may be identified as fallow land or unproductive land. In regulatory term those lands are considered as culturable waste land and those lands are being fallow during five consecutive years. Those lands may be utilized under the guidance of Culturable Waste Land (Utilization) Ordinance, 1959 (Ordinance No. E.P. XIII of 1959).

11.4.2 Implementation, Monitoring and Evaluation of the Land Use Plan

The implementation, monitoring and evaluation strategies of Structure Plan have been illustrated in Chapter-9 of Part-A. The Land Use Plan should also be implemented, monitored and evaluated under the same strategy by strengthening capacity of the Paurashava and forming a Monitoring and Evaluation Committee (MEC).

As the Land Use Plan is a mid-term plan with a period of 10 years (2011-2031), it will be implemented on phase wise according to priority. The proposals have been prioritized based on the most urgent community needs, since the Government of Bangladesh is a least developed country and it has a very limited budget on infrastructure development. Besides, the Paurashava Authority itself is not capable of financing this huge cost.

The land use Plan will be implemented gradually following prioritized landuse proposals. Phasing of land use proposals was done based on the priority needs for development of the town. The Phase-I of the land use proposals, to be also incorporated in the Ward Action Plan, will be implemented within first 5 year (2011-2016) of the land use plan period. The consultants have proposed Phase-II of the proposals to be implemented after first 5 years following the recent past Ward Action Plan. The details of phasing are shown in **Table-11.5**. After each 5 years the Land Use Plan will be evaluated, updated and new Ward Action Plan will be formulated under the changing circumstances.

Table 11.5: Phasing of Specific Land Use Proposals (2011-2031)

Phase-I				Phase-II		
ID	**Use**	**Location**		**ID**	**Use**	**Location**
BT	Bus Terminal	At the middle of the Paurashava; beside Rajbari-Kushtia Road		C	College	At the middle of the Paurashava
CM	Cattle Market	West side of the Paurashava		CP	Central Park	Near Kamalapur Road
Hos-2	Hospital (Community)	At the South side of the Paurashava		Hos-1	Hospital (Community)	Beside Matpara Road
NM-1	Neighborhood Market	Beside Peteldanga Road		Hos-3	Hospital (Community)	At the north side of the Paurashava
NM-2	Neighborhood Market	South side of the Paurashava		HS	High School	Near Peteldanga Road
NM-3	Neighborhood Market	Near Rail Station		IZ-1	Industrial Zone	Beside Peteldanga Road
NP-1	Neighborhood Park	Beside Peteldanga Road		IZ-2	Industrial Zone	Beside Peteldanga Road and Station to Janipur Bazar Road
NP-2	Neighborhood Park	Near Matpara Road		LIH	Low Income Housing	Beside Kamalapur Road
PB	Paurashava Building	Near Kamalapur High School		NP-3	Neighborhood Park	At the North side of the Paurashava
Pg	Playground	Beside Kalibari Road		RZ	Resettlement Zone	At the middle of the Paurashava
PS-1	Primary School	Beside Kalibari Road		SM-2	Super market	At the middle of the Paurashava
PT-1	Public Toilet	Beside Station to Janipur Bazar Road		St	Stadium	Near Kamalapur Road
PT-2	Public Toilet	Near Peteldanga Road		TT	Truck Terminal	Beside Rajbari-Kushtia Road
PT-3	Public Toilet	Beside Rajbari-Kushtia Road		VI	Vocational Institute	At the middle of the Paurashava
PT-4	Public Toilet	Near Station to Janipur Bazar Road		WC-1	Ward Centre	Beeside Station Road

Phase-I				Phase-II		
ID	**Use**	**Location**		**ID**	**Use**	**Location**
PT-5	Public Toilet	Near Bazar Area		WC-2	Ward Centre	Near Rajbari-Kushtia Road and behind Upazila Complex
PT-6	Public Toilet	Beside Station to Janipur Bazar Road		WC-3	Ward Centre	Near Rail Station to Janipur Bazar Road
PT-7	Public Toilet	South side of the Paurashava		WC-4	Ward Centre	Beside Kalibari Road
SH	Slaughter House	Near Bazar Area and Gorai River		WC-5	Ward Centre	Beside Thana Road
SM-1	Super Market	Near Bazar Area and Gorai River		WC-6	Ward Centre	At the middle of the Paurashava
TS-1	Tempu Stand	Beside Train Station to Janipur Bazar Road		WC-7	Ward Centre	At the South side of the Paurashava
TS-2	Tempu Stand	Beside Train Station to Janipur Bazar Road		WC-8	Ward Centre	At the South side of the Paurashava
TS-3	Tempu Stand	Beside Thana Road		WM	Wholesale Market	Near Rajbari-Kushtia Road
WDG	Waste Disposal Ground	At the East side of the Paurashava				

Monitoring 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. Thus the Plan should be monitored by the MEC for proper implementation of the Plan. The MEC should call for a meeting at least two times a year on regular basis. In addition, it should sit for a meeting in any situation if any dispute arises regarding implementation of the Plan. After expiry of any plan evaluation will be made about the errors and omissions. Such evaluation will help to take corrective measures in the next plan.

Chapter 12

Transportation and Traffic Management Plan

12.1 Introduction

Transportation and Traffic Management Plan is an advanced document that sets out the long-term direction for transport in a particular area. The plan guides development of a town's transportation system. It covers the movement of people by mode, for example, public transport, car, walking and cycling, and freight by road, railway and waterway as appropriate to an area.

It is useful for defining the direction of transport-related issues in a particular area. It can recognize the links between transport and land use and urban form and set objectives and policies to address these linkages.

The Khoksa Paurashava connects Rajbari district head quarter and Kushtia district head quarter by both road and train. Most of the offices are located in the middle part of the Paurashava, whereas the educational institutions are scatteredly distributed all over the Paurashava. All markets and shopping centers are placed along the road sides.

The project area is served by 60.206 kilometers of roads. Out of the total length of roads 39.532 km are pucca, 9.605 km are semi-pucca and 11.069 km are Katcha.

There are two major intersections known as Upazila Mor and Thana mor. Those intersections are connects with several important Roads within the jurisdiction of the Paurashava. There is a rail line, which connects Khoksa with Kushtia, Khulna, Rajshahi and Dhaka. Food grain such as rice are continuously transporting by truck towards Dhaka regularly.

Rickshaw, Electric Rickshaw and Rickshaw Van are the main mode of transport within the jurisdiction of the Paurashava. Bhodvodi is a locally made motorized vehicle are another mode of transport, those are being using passenger into the heart from long distance.

12.1.1 Approach and Methodology

The methodology of the study could be illustrated through five-step process for the assessment of Transportation and Traffic Management Plan. These five steps are:

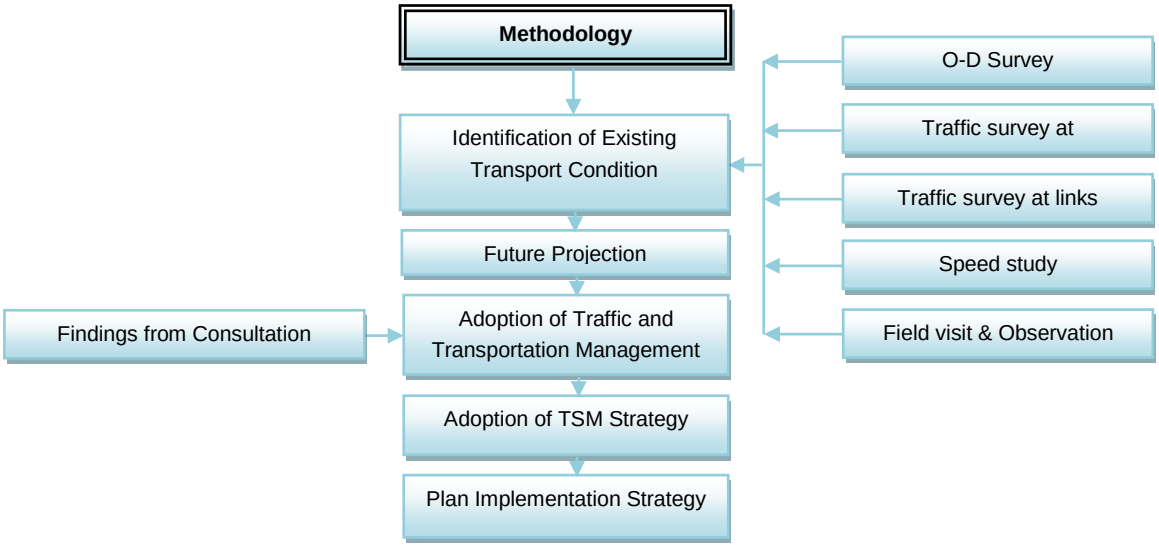


Figure 12. 1: Flow Chart of the Methodology

The first step of the methodology of transportation and traffic management plan is to identify the existing transport condition, which is the result of O-D survey, traffic survey at intersection, traffic survey at links and speed study; have already described in the survey report. In the next step, the future projection of transportation network and traffic demand is identified, which is described in the interim report. The third phase of the study is to adopt new traffic and transportation management plan, which is prepared based on future projection. After that, some strategies on transportation system management (TSM) are undertaken. Finally, plan implementation strategies are espoused based on both transportation management plan and transportation system management.

12.2 Existing Conditions of Transportation Facilities

12.2.1 Roadway Characteristics and Functional Classification

The road hierarchy of Khoksa Paurashava is limited to Feeder Road Type-A (District Roads), Feeder Road Type-B and Rural Roads (Category R1, R2 & R3) only. There is no National or Regional Highways in this Paurashava. According to the Rural Infrastructure Strategy Study '96 of World Bank & Planning Commission the Road hierarchy of Bangladesh is categorized as illustrated in **Table 12.1**.

Table 12.1: Road hierarchy in Bangladesh

Seq.	Category	Definition
01	National Highway (NH)	Connecting national capital with divisional head quarters, old district headquarters, port cities and international highways;
02	Regional Highway (RH)	Connecting different regions with each other, which are not connected by the national highways;
03	Feeder Road Type-A (FRA)	Connecting Thana headquarters to the arterial network;
04	Feeder Road Type-B (FRB)	Connecting growth centers to the RHD network (FRA or arterial road) or to the Thana Headquarters;
05	Rural Road Class 1 (R1)	Connecting union headquarters/local markets with the Thana headquarters or road system.
06	Rural Road Class 2 (R2)	Connecting villages and farms to local markets/union headquarters.
07	Rural Road Class 3 (R3)	Roads within villages.

Source: Rural Infrastructure Strategy Study, 1996

There are as many as three types of roads are existed in Khoksa Paurashava which is Pucca, Semi-Pucca and Katcha. The Pucca roads are usually the paved bituminous roads, Semi-Pucca roads are mostly the Herring Bone Bond (HBB) type, and the Katcha roads are usually earthen roads. A list of some major roads of functional importance in the regional transport network has been given in **Table 12.2** below:

Table 12.2: Inventory of Some Major Roads at Khoksa Paurashava

Sl. No.	Name of Major Roads	Road Hierarchy	Width (m)	Total Length (m)	Road Type
01	Rajbari to Kushtia Road	Regional Highway	6.023	2866.89	Pucca
02	Janipur Bazar Road	Feeder Road Type-B	5.781	733.83	Pucca
03	Rail Station to Janipur Bazar Road	Feeder Road Type-B	5.719	3376.92	Pucca

Source: Traffic and Transport Survey by DDC, 2009

12.2.2 Traffic Pattern

The traffic pattern of Khoksa Paurashava is characterized by only road transport which is available among all the transport modes prevailing in other towns and cities all over Bangladesh. Both vehicular and pedestrian traffic is observed to ply over the town. The types of vehicular traffic generally found in that mode are:

Motorized Traffic		**Non-Motorized Traffic**
□ Car/Jeep	□ Truck	□ Cycle Rickshaw
□ Bus	□ Nosimon	□ Rickshaw van
□ Micro-bus	□ Auto-rickshaw/tempo	□ Animal/push cart and
□ Mini-bus	□ Motor cycle	□ Bi-cycle

It was revealed from traffic volume survey that non-motorized traffic comprises 92.41% of the total volume and the remaining 7.59% is composed of motorized traffic. Thus Non-motorized traffic (NMT) should be considered as a major issue in formulating traffic and transportation management plan.

12.2.3 Intensity of Traffic Volume

In most important intersections, traffic surveys were conducted. Considering office time from 9:00 AM to 5:00 PM, intersection traffic flows were presented during morning peak hour 9:00-10:00 AM and evening peak hour 4:00-5:00 PM. The off-peak hour have been considered at 6.00-7.00 AM and 11.00-12.00 PM for lowest volume of traffic in the observed intersection. Upazila Mor and Thana mor are the most important intersections of the Khoksa Paurashava. Almost all mode of traffic is found at this intersection. The diagrams of these two intersections are illustrated in Figure-12.2A and 12.2B.

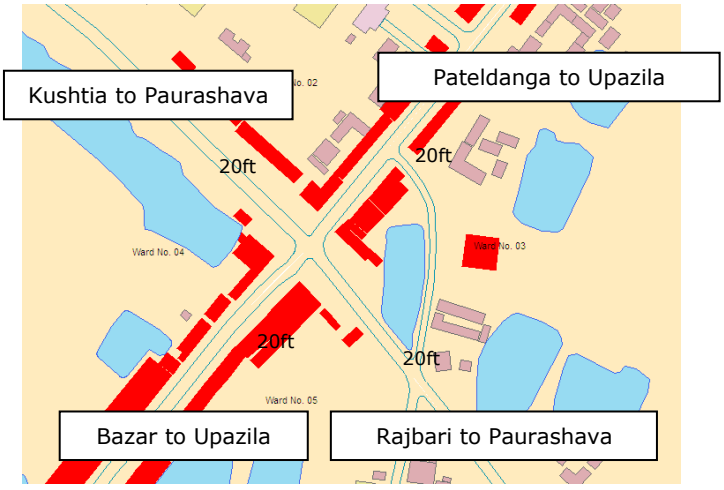


Figure 12.2A: Flow Diagrams of Upazila Mor

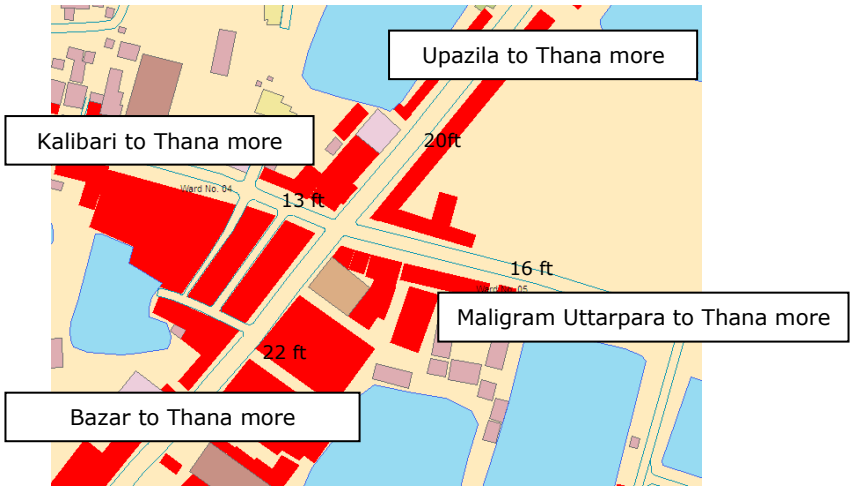


Figure 12.3B: Flow Diagrams of Thana mor

The peak hour and off-peak hour volume of motorized (MT) and non-motorized traffic at both intersections has been presented in **Table-11.3** below.

Table 12.3: Peak and Off-Peak Hour Traffic Volume at Major Intersections

Peak/Off-Peak	Day time	Duration	Traffic Volume			
			Upazila Mor		Thana mor	
			MT	NMT	MT	NMT
Peak	Morning	8:00 AM-10:00 AM	584.5	3038.74	226.5	4903.71
	Evening	3:00 PM-5:00 PM	531	3078.35	214.5	4633.57
Off-Peak	Morning	6:00 AM-8:00 AM	447.5	1952.31	67.5	2292.8
	Evening	6:00 PM-8:00 PM	413	1774.49	63	2150.34

Source: Traffic and Transport Survey by DDC, 2009

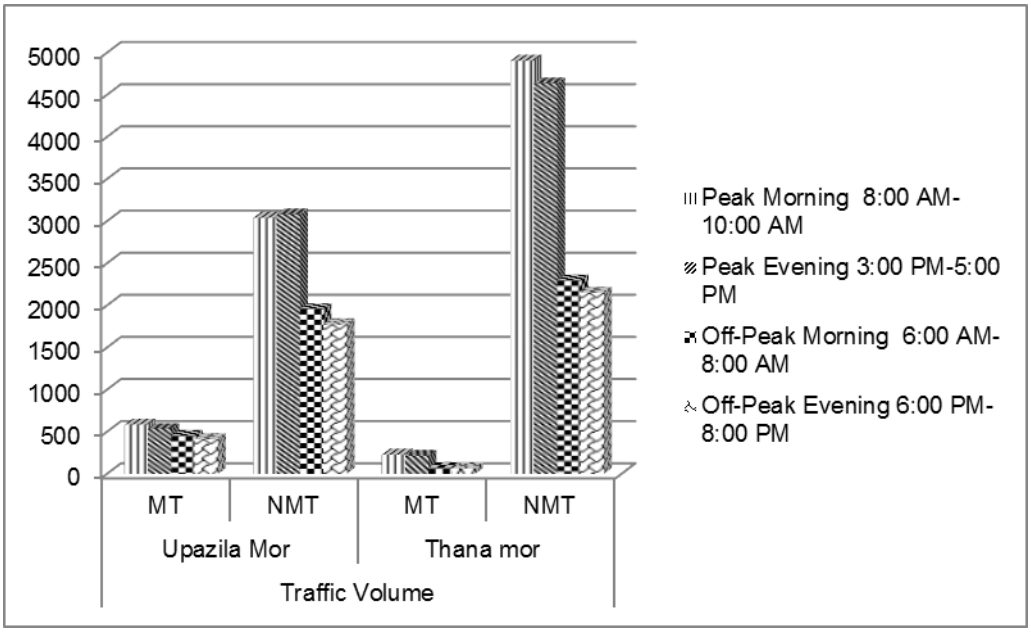


Figure 12.4: Composition of Peak/Off-Peak Traffic Volume at two Intersections

12.2.4 Level of Service: Degree of Traffic Congestion and Delay

Level of Service (also called Quality of Service or Service Quality) refers to the speed, convenience, comfort and security of transportation facilities and services as experienced by users. Level-Of-Service (LOS) ratings, typically from A (best) to F (worst), are widely used in transport Planning to evaluate problems and potential solutions. Because they are easy to understand, Level-Of-Service rating often influences transport planning decisions. Such ratings systems can be used identify problems, establish performance indicators and targets, evaluate potential solutions, compare locations, and track trends.

Level of service (LOS) is a measure used by traffic engineers to determine the effectiveness of elements of transportation infrastructure. LOS is most commonly used to analyze highways by categorizing traffic flow with corresponding safe driving conditions.

From Khoksa through main roads are Rajbari to Kushtia Road, Station to Janipur Bazar Road, Thana Road and Kamalapur Road. Traffic generation centers are mostly Bazar area, Upazila Complex, Rail Station, Police Station, Different Educational Institutions, Different Markets, Katcha Bazars, Hospitals, Land Office and Different Govt. Offices.

The bazaar area, Upazila Mor and Thana Mor are the most congested areas in Khoksa Paurashava. The entire area from Upazila Mor to Thana Mor can be considered as congested areas.

There are various methods of determining LOS of road links and intersections, e.g., average vehicle control delay method (for intersection), speed-based method and vehicle capacity ratio (v/c) method. The Level of Service measure is much more suited to American Roads than roads in Europe and Asian countries like Bangladesh where Speed ranges of Level of Service (LOS) categories of urban streets are not well defined for highly heterogeneous traffic flow condition on urban streets in Indian context. Moreover, it requires more relevant, accurate and specific data on speed, delay, traffic volume, capacity of roadway link derived from detailed engineering survey. For an upazila level small town like Khoksa, where Non-motorized traffic comprises about eighty percent volume, assessment of Level of Service (LOS) is not requisite in the formulation of Traffic and Transportation Management Plan.

12.2.5 Facilities for Pedestrians

Most of the public generally considers pedestrian facilities to be limited to sidewalks; however, they encompass a much broader scope of services and facilities. Pedestrian facilities include, but are not limited to, traffic control devices, curb ramps, grade separations (overpasses and underpasses), crosswalks, and design features intended to encourage pedestrian travel (such as traffic calming devices including speed bumps or center refuge islands). In general, these facilities parallel the roadway system and provided as part of the public right-of-way. Pedestrian facilities or “pedestrian lanes” provide people with space to travel within the public right-of way that separated from roadway vehicles. It improves mobility for pedestrians and provides access and an alternative means of travel to and from home, work, parks, schools, shopping areas, and transit stops. It also provides places for children to walk, run, skate, bike, and play, where no walkways are provided, or where walkways are in poor repair or have missing sections.

It is obligatory to mention here that, at present there is no pedestrian facilities available at Khoksa Paurashava.

12.2.6 Analysis of Existing Deficiencies

Like any other upazila town, Khoksa has also transportation deficiencies, which are identified from two different sources. Firstly, by reconnaissance survey of the town, field observation interview of passenger and operator and secondly, by means of household sample survey.

Roadway capacity Deficiencies

Narrow Road Width

Narrow widths of roads and poor maintenance have been marked as major transport problems in the town. It causes higher traffic volume exceeding roadway capacity and creates serious traffic congestion on the narrow streets. There is little chance that the authority will be able increase the road width in highly built up areas, especially in the crossing point of main bazaar area, as there will be high cost involvement and social-pressure on any attempt to demolition will be very high.

Traffic congestion due to narrow width of roads has been identified as one of the challenging issues regarding the resolution of transport problem. Most of roads have been constructed without maintaining the minimum standard of road width. A list of some functionally important narrow roads has been provided in **Table-12.4** below.

Table 12.4: List of Narrow Roads

Sl. No.	Road Name	Road Hierarchy	Avg. Width (m)	Length (m)	Type
01	Pateldanga Road	Rural Road Class 1	2.886	1270.21	Pucca
02	Kamalapur Road	Rural Road Class 1	3.016	1322.04	Pucca
03	Matpara Road	Rural Road Class 2	3.344	1516.62	Pucca
04	Akterpur Road	Rural Road Class 3	3.082	1123.11	Pucca

Traffic Conflict

Traffic conflict is common and frequent in towns where there is admixture of transport vehicles – slow and fast – in the streets. Areas of conflict occur at point where the intensity of traffic movement is high. The consultant studied the traffic movement in all over the town and identified two main points where the traffic conflict is highest. These are Upazila Mor (intersection) and Thana Mor. At these points the slow moving vehicles, like, rickshaw and vans come in conflict with motor vehicles, creating traffic congestion. As the slow moving vehicles are higher, the conflict is usually frequent.

The identified reasons for traffic conflict are improper intersection design, parking of vehicles on the street, waiting of operators on the roads looking for possible passengers, absence of traffic signal, disobedience of traffic rules etc.

Operational Safety, Signal and other Deficiencies

Like any other upazila town, which is beyond the regional and national movement directly, Khoksa Paurashava has no traffic management system. There is no traffic point and traffic islands including road dividers, no signal posts. That is why operational and road safety is not existed.

12.2.7 Condition of other mode of transport (Rail/Water/Air)

Khoksa Paurashava is well connected with Kushtia, Khulna, Rajshahi and Dhaka by railway. River Gorai have not enough navigibility. So, there is no prospect of water transportation within this Paurashava. There is no air transport facility in Khoksa, for air travelling the people of Khoksa depending upon the Capital City Dhaka or Jessore.

Map 12. 1: Existing Road Network of Khoksa Paurashava

12.3 Future Projections

12.3.1 Travel Demand Forecasting for Next 10 Years

Travel demand occurs as a result of thousands of individual travelers making individual decisions on how, where and when to travel. These decisions are affected by many factors such as family situations, characteristics of the person making the trip, and the choices (destination, route and mode) available for the trip.

Before forecasts are made of travel, it is necessary to determine how the community will look in the future. Transportation is directly linked to land use. Trips are assumed to follow future land use patterns. If land use is changed, there should be a change in travel.

The travel forecasting process is at the heart of urban transportation planning. This process is used to estimate the number of trips that will be made on a transportation systems alternative at some future date. Many assumptions need to be made about how people make decisions, the factors they consider and how they react a particular transportation alternative.

Travel demand is expressed as the number of persons or vehicles per unit of time that can be expected to travel on a given segment of a transportation system under a set of given land-use, socioeconomic, and environmental conditions.

Three factors affect the demand for urban travel:

- Location and intensity of land use
- Socioeconomic characteristics of people living in the area; and
- Extent, cost, and quality of available transportation services

Land use characteristics are a primary determinant of travel demand. The amount of traffic generated by a parcel of land depends on how the land is used, for example, shopping centers, residential complexes, and office buildings produce different traffic generation patterns. Socioeconomic characteristics of the people also influence the demand for transportation. Lifestyles and values affect how people use their resources for transportation, for example, a residential area consisting of high-income workers will generate more trips by automobile per person than a residential area populated primarily by low-income workers.

The availability of transportation facilities and services, referred to as the supply, also affects the demand for travel. Travelers are sensitive to the level of service provided by alternative transportation modes, when deciding whether to travel at all or which mode to use they consider attributes such as travel time, cost, convenience, comfort, and safety. To extrapolate the transport demand, it was necessary to accumulate data on Employment, vehicle ownership, trip distribution, etc. Though some categories of data mentioned above have been collected by Socio-economic Survey, yet these data sets are scanty to enable forecast of future travel demand.

Furthermore, the traffic survey for the UTIDP was conducted to get the overall picture of traffic pattern in the study area and this survey is not detail enough to allow extrapolation of traffic. That is why; the consultants have some limitations to adopt any traffic model to forecast future traffic demand. The complexities of traffic in the study area, as per common

observation are assumed to be insignificant. However, prior to maintaining proper planning standard, the Paurashava is yet capable of regulating the traffic. Nevertheless, the recommended planning standards of road are the followings (Table 12.5):

Table 12.5: Recommended Planning Standard

Types of Road	Recommended width
Regional Roads	RoW 150 ft
Paurashava Primary Roads	RoW 60, 80, 120 ft
Paurashava Secondary Roads	RoW 40ft
Paurashava Tertiary Roads	RoW 30 ft
Local/ Access Roads	RoW 20 ft

Source: UTIDP Planning Standard, LGED

However, a little bit of jamming concentration has been observed in some major roads of the Paurashava. Generally, the concentration of traffic reaches to its peak during 9:00 am-10:00 and 4:00 pm-5:00 pm. Moreover, it is also observed that most of the major roads of Khoksa Paurashava are below 6.10 meter in width, which is assumed to be a potential threat to accommodate the future traffic. Therefore, the road capacity needs to be improved as per the UTIDP planning standard of LGED.

12.3.2 Transportation Network Considered

The growth of transport networks obviously affects the social and economic activities that an area can support; yet the dynamics of how such growth occurs is one of the least understood areas in transport, geography, and planning. Transport network changes are treated exclusively as the result of top-down decision-making. Changes to the transport network are rather the result of numerous small decisions (and some large ones) by property owners, firms, developers, towns, cities, counters, and MPOs in response to market conditions and policy initiatives. Understanding how markets and policies translate into facilities on the ground is essential for scientific understanding and improving forecasting, planning, policymaking, and evaluation.

12.3.3 Future Traffic Volume and Level of Service

Traffic volume, as indicated by traffic counts at various locations on the roadway network; which reflect current travel patterns and how well the network is serving the travel demand.

When planning ahead to address the needs of our transportation network, it is important to project the level of traffic that we can anticipate during our planning period and beyond. Population growth plays a key role in determining the needs of a transportation system. Generally, an increase in population results in an increase in the use of transportation facilities; which in most cases means more vehicles on the roadways.

The two intersections are Upazila Mor and Thana Mor are the most important intersections of the Khoksa Paurashava. The intensity of traffic movement observed in Upazila Mor and Thana Mor is high and traffic conflict is prevalent at these points.

The Level of Service (LOS) represents the minimum acceptable performance standards on a particular roadway facility. The Paurashava authority should have adopted the policy LOS for their road system. The key factors in the policy of Level of Service (LOS) consider the following:

- The individual characteristics of the community, its goals, objectives and needs

- The ability to provide the facilities that are determined necessary to maintain the policy level of service for current and future traffic volumes
- The ability to fund the facilities that are determined necessary to maintain the policy level of service for current and future traffic volumes

12.4 Transportation Development plan

12.4.1 Plan for Road Network Developemnt

Road Network Plan

Planning standard is a fundamental tool for formulation of any planning perspective including transport plan. The suggested planning standards of road width for UTIDP are illustrated in Table 12.5. The standards are meant for use by UTIDP, LGED and other planning and development agencies. The consultants to draw up the current series of plans have adopted the standards. An integrated road network plan has been prepared commensurating the planning standards and considering the convenient movement of all vehicular and pedestrian traffic. Three types of road, such as Paurashava Primary Road, Secondary Road and Local Road are proposed designating a unique ID No. to each road for identifying them in map. Paurashava Primary Roads are not proposed in the Khoksa Paurashava, because of well-connected railway network and few geographic constrains of the area. The road network plan along with transportation management plan is presented in **Map 12.1** below.

Summary of Road Network Plan

Total 69.81 km of road development has been proposed in Khoksa Paurashava. Total 22.63 km road will be newly constructed and 23.76 km road will be widening up to the planning period 2031. Length of the local road will be 10.05 km and RoW of these roads will be 20 ft which covers 14.40% of total road network development proposal. Total length of tertiary road will be 11.90 km (17.04%) and RoW of these roads will be 30 ft for this ward. Total length of secondary road will be 12.50 km and RoW of these roads will be 40 ft for this ward. The rest road will be developed as primary road and its RoW will be 60 ft, 80 and 100 ft. The detailed scenario of road network development proposal is given in **Table 12.6.** In the following paragraph more detail scenarios of different are given.

Table 12.6: Summary of Road Network Plan of Khoksa Paurashava

Width in Ft	Type of Road	Total		New Road		Road Widening	
		Length (km)	%	Length (km)	%	Length (km)	%
Unchanged	Access Road	23.42	33.54	0.00	0.00	0.00	0.00
20 ft	Local Road	10.05	14.40	5.00	22.08	5.05	21.27
30 ft	Tertiary Road	11.90	17.04	4.56	20.17	7.33	30.85
40 ft	Secondary Road	12.50	17.90	7.90	34.91	4.60	19.34
60 ft	Primary Road	5.17	7.41	5.17	22.84	0.00	0.00
80 ft	Primary Road	3.74	5.35	0.00	0.00	3.74	15.72
100 ft	Primary Road	3.05	4.37	0.00	0.00	3.05	12.83
Total		**69.81**	**100.00**	**22.63**	**100.00**	**23.76**	**100.00**

Paurashava Primary Road

Kustia-Khoksa road will be developed as primary road for Khoksa Paurashava. Total length of primary road is 11.954 km with 60 ft, 80 ft and 100 ft RoW. About 6.784 km primary road will be widening and rest 5.17 km new primary road will have to be constructed. Figure 12.5 shows the layout design of primary road with 80ft RoW.

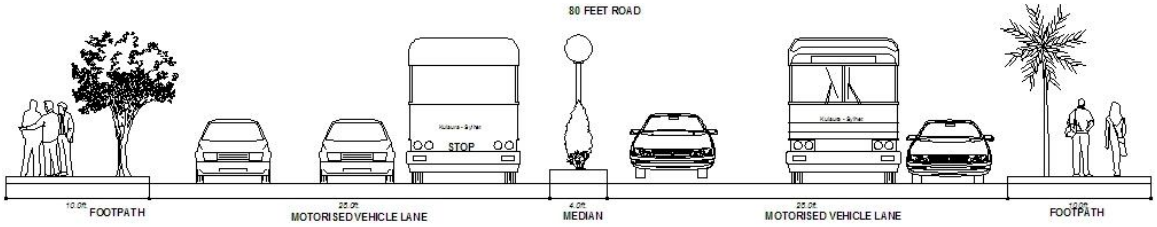


Figure 12.5: Primary Road with 80 ft RoW

Paurashava Secondary Road

Total proposed secondary road is 12.50 km with 40 ft RoW. Within in these 4.60 km secondary road will be widening which covers 19.34% of total road widening proposal and rest 7.90 km new secondary road will be constructed which covers 34.91% of total new road proposal for the town. Figure 12.6 shows the layout design of secondary road with 40 ft RoW.

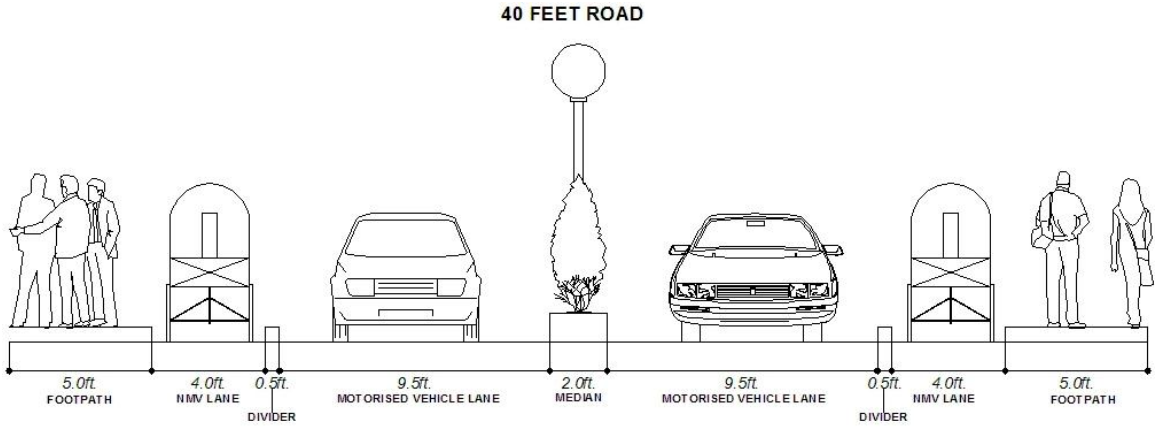


Figure 12.6: Secondary Road with 40 ft RoW

Tertiary Road

Total local road is 11.90 km with 30 ft RoW, which covers 17.04% of total road network plan of Khoksa Paurashava. Of which, total 7.33 km road will widening existing road and 4.56 km road will newly construct to fulfill the future need of the Paurashava. Figure 12.7 shows the layout design of local road with 30 ft RoW for Khoksa Paurashava.

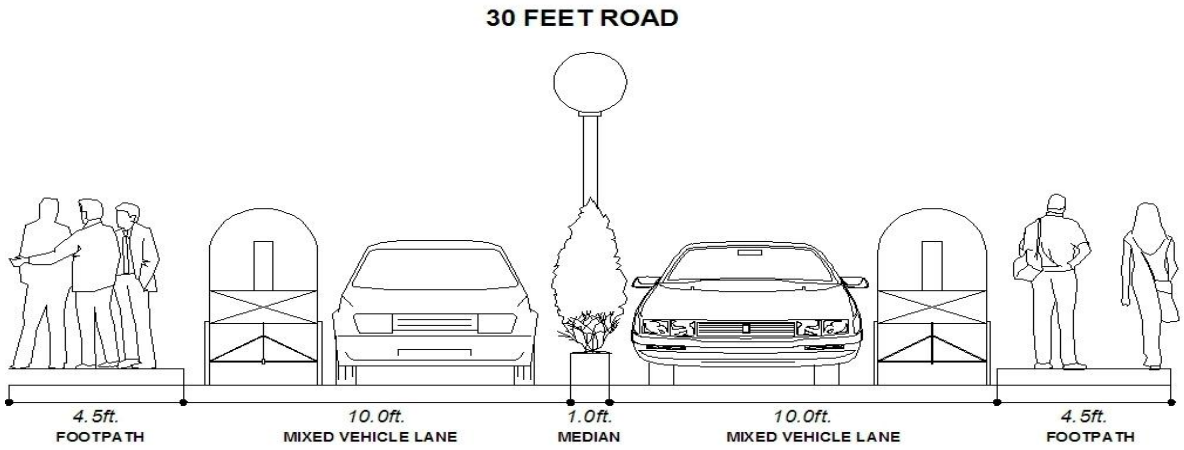


Figure 12.7: Tertiary Road with 30 ft RoW

Proposal for improvement of the existing road networks

Traffic management measures may be adopted to increase traffic capacity and safety. The improvement could be done by removing the deficiencies in the existing core road network by widening and/or strengthening of selected stretches/ corridors in a phased manner and improvement of road geometrics and safety provisions. The proposals for widening of roads existing roads are listed in tabular form (**Table: 12.7**) below:

Table 12.7: Summary of road widening proposal at Kholsa Paurashava

Width in Ft	Type of Road	Road Widening	
		Length(km)	%
20 ft	Local Road	5.05	21.27
30 ft	Tertiary Road	7.33	30.85
40 ft	Secondary Road	4.60	19.34
80 ft	Primary Road	3.74	15.72
100 ft	Primary Road	3.05	12.83
Total		**23.76**	**100.00**

Summary of Proposed new roads

The Urban Area Plan provides brief description of any proposed transport improvements. The transport content of this plan has been developed around the framework of the Structure Plan. The specific transport proposals set out in the Urban Area Plan for public consideration include new road schemes and improvements, traffic management measures, the co-ordination of public transport services, the control of car and lorry parking and the improvement of cyclist and pedestrian safety. The proposals put forward for discussion to the mass people of the Paurashava. The Paurashava authority also advises about road development should not be duplicated in the public examination of Urban Area Plan and Ward Action Plans. Local Authority roads, which are not strategic, are not included in the Ward Action Plan and both the need for the road and the line of the route are matters for the Urban Area Plan to consider. A list proposed of new roads have been made after studying the existing road network, travel demand pattern, potential for future urban growth and conducting public consultation meeting with Paurashava officials, councilors, local people and other stakeholders which is presented in **Table 12.8**.

Table 12.8: Summary of Proposed New Roads in the Project Area

Width in Ft	Type of Road	New Road	
		Length(km)	%
20 ft	Local Road	5.00	22.08
30 ft	Tertiary Road	4.56	20.17
40 ft	Secondary Road	7.90	34.91
60 ft	Primary Road	5.17	22.84
Total		**22.63**	**100.00**

Map 12. 2: Road Network Plan for Khoksa Paurashava

12.4.2 Plan for Transportation Facilities

Transportation Facilities Plan

Bus Terminal

There is no bus terminal situated in the Paurashava area. A bus Terminal is proposed at the middle of the Paurashava; beside Rajbari-Kushtia Road. As per standard of UTIDP the required area of Bus Terminal for the projected population of 20742 up to year 2021 is about 1.04 acre. According to the consultants' justification, an area of 1.210 acres is proposed for the bus terminal. It comprises Plot No. 2161-2164, 2227, 2228, 2230-2233, 2250 of Khoksa Mouza. The location and outline of the proposed bus terminal is shown in **Map 12.1**. The details are given in **Table-12.9**.

Truck Terminal

A truck terminal is proposed to the Beside Rajbari-Kushtia Road, Proposed Primary road (PR-1). As per standard of UTIDP the required area of Truck Terminal for the projected population of 20742 up to year 2021 is about 0.52 acre. An area of 0.886 acres is proposed for the truck terminal. It comprises Plot No. 805-808, 839-841, 843-845, 852 of Khoksa Mouza. The location and outline of the proposed truck terminal is shown in **Map 12.1**. The details are given in **Table 12.9**.

Table 12.9: List of Proposed Transport Facilities

ID	Name of Facilities	Location	Ward No.	Area (acre)	Mouza Schedule
BT	Bus Terminal	At the middle of the Paurashava; beside Rajbari-Kushtia Road	Ward 3	1.210	Mouza- Khoksa Plot No. 2161-2164, 2227, 2228, 2230-2233, 2250
PA	Parking Area	Beside Matpara Road	Ward 4	-	-
TS-1	Tempu Stand	Beside Train Station to Janipur Bazar Road	Ward 1	0.237	Mouza- Bhaluka Plot No. 330
TS-2	Tempu Stand	Beside Train Station to Janipur Bazar Road	Ward 3	0.351	Mouza- Krishnapur Sarkar para Plot No. 156-159, 161, 162, 193, 196
TS-3	Tempu Stand	Beside Thana Road	Ward 6	0.356	Mouza- Khoksa Plot No. 172-174, 176
TT	Truck Terminal	Beside Rajbari-Kushtia Road	Ward 2	0.886	Mouza- Khoksa Plot No. 805-808, 839-841, 843-845, 852

Tempo Stand

Tempo is now a major and cheap commuter in small towns that play important role in commuter transportation. There is no formal tempo stand in the Paurashava. Thus, three tempo stands (with unique ID TS-1, TS-2 and TS-3) along with rickshaw/van stand are proposed in Ward-1 (Beside Train Station to Janipur Bazar Road), Ward-3 (Beside Train Station to Janipur Bazar Road) and Ward-6 (Beside Thana Road). The location and outline of the proposed tempo stand/rickshaw stand is shown in **Map 12.1**. As per standard of UTIDP the required area of this facility is about 0.25 acre/one tempo stand. Proposed area of TS-1, TS-2 and TS-3 are 0.237, 0.351 and 0.356 acre respectively. The details are shown in **Table 12.9.**

Bus Stop

A bus stop is a designated place where buses stop for passengers to board or leave them. These are normally positioned on the highway. The construction of bus stops tends to reflect the level of usage. Only Inter-Upazila bus movement pattern is observed to ply over the Paurashava and no town service is existed in this area. Through traffic is highly discouraged to pass over the central part of the Paurashava. For the movement of Inter-Upazila bus and other through traffic, an alternative option is proposed; where four secondary roads will act as by-pass road and channelize the traffic movement without interrupting the bazar area. Every bus will stand at the proposed bus terminal to pick the passengers.

Parking and Terminal Facilities

There is no parking facilities provided in Khoksa Paurashava. People are habituated for parking beside the roads. This parking practice occupied considerable spaces and reduces the effective road width. Particularly in bazaar area where a number of markets exist the parking problem become acute during weekly hat days. If it is possible to integrate parking area for tempo, rickshaw, van, etc. near to bazar area the congestion problem will be solved.

In order to mitigate the traffic congestion and traffic conflict at the bazar area a parking area is proposed (**Map-12.1**). An area beside Matpara road of Khoksa Mouza has been proposed adjacent to Khoksa Bazar area. On-street parking shall be prohibited on all roads within the bazar area except at places where it is specifically permitted for parking.

Adequate terminal facilities will be provided at the bus and truck terminal for the convenience and comfort of the commuters.

The bus terminal should have to accommodate the following services:

- Ticket Counter
- Passenger-shed
- Workshop
- Cleaning and washing facility
- Loading and unloading place
- Bus parking space
- Toilet facility
- Waiting room

The following facilities are proposed to accommodate in the truck terminal complex:

- Workshop
- Cleaning and washing
- Loading and unloading yard
- Truck parking space
- Toilet facility

Development of Facilities for Pedestrians, Bicycles and Rickshaws

Footpath may refer to sidewalk, which runs along vehicular roads. It is a separate lane exclusively designed for the purpose of pedestrian movement. The footpath is quite safe and free from any accident. Unfortunately, there is no footpath besides any road of Khoksa Paurashava.

The transportation system within residential neighborhoods should favor pedestrian movement and discourage vehicular through traffic in both new and existing neighborhoods. A pedestrian system that utilizes neighborhood streets and paths to link the residents with the commercial and school functions serving the area will be encouraged. A pedestrian ways (Footpath) of 6.53 km is proposed for the smooth movement of pedestrian traffic. The details are illustrated in Table-12.10 and the alignment is shown in Figure 12.4 below.

Table 12.10: List of Proposed Footpath/ Pedestrian Way

Sl. No.	Alignment	Length (m)
01	Janipur Bazar Road	1362.277
02	Thana Road	1940.531
03	Other Roads	3228.862
Total		**6531.6699**

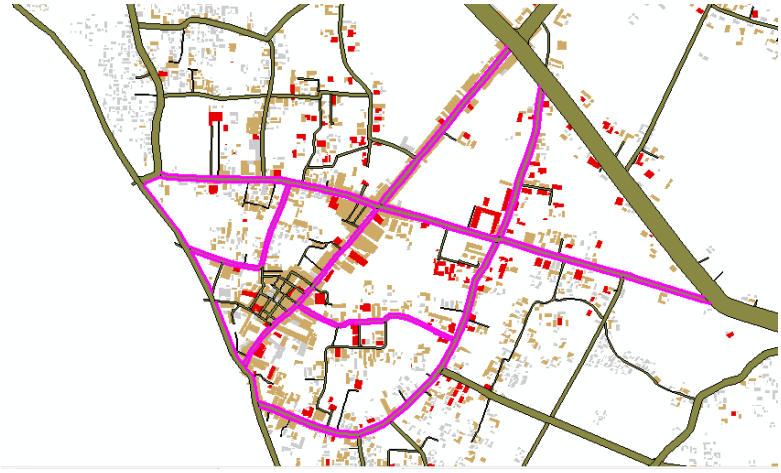


Figure 12.8: Alignment of Footpath/ Pedestrian Way

The provision of separate bicycle or rickshaw lane is not a requisite for a low level of traffic movement pattern, which is prevalent in any upazila level small town like Khoksa Paurashava.

Other Transportation Facilities

Roundabout

A roundabout is a type of circular intersection. Well-designed roundabouts are a safe, effective form of junction. They can handle much higher volumes of turning traffic. Their safety benefits result primarily from the control they exercise on approach speeds, and this makes them ideal for junctions at the entrance to towns and villages. They are also one of

the safest ways of handling the transition between dual carriageways and single carriageways.

The presence of mixed traffic, including NMVs and pedestrians, means that roundabouts must be designed primarily for speed control. The proposed list of roundabout in Khoksa Paurashava is given in Table-12.11 and the locations are shown in Figure-12.5, 12.6 & 12.7.

Table 12.11: List of Proposed Roundabout in Khoksa Paurashava

ID	Ward No.	Location
1	3	Maligram mor
2	3	Upazila mor
3	1	Rajinathpur mor

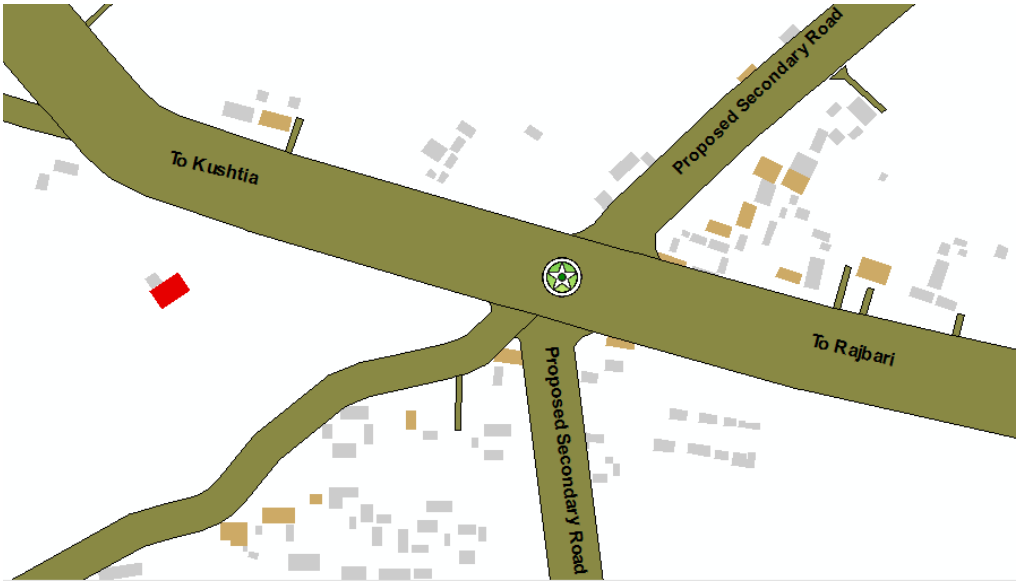


Figure 12.9: Proposed Roundabout at Maligram intersection

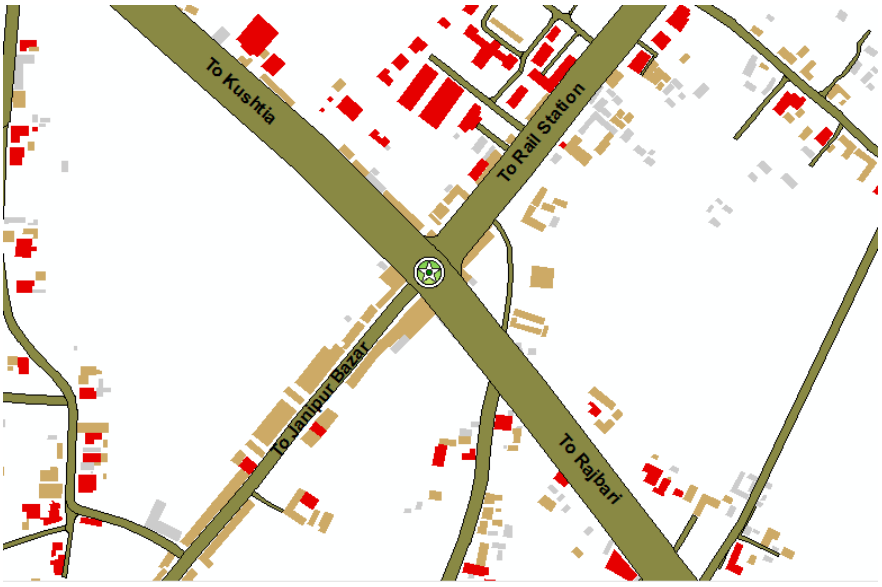


Figure 12. 10: Proposed Roundabout at Upazila mor

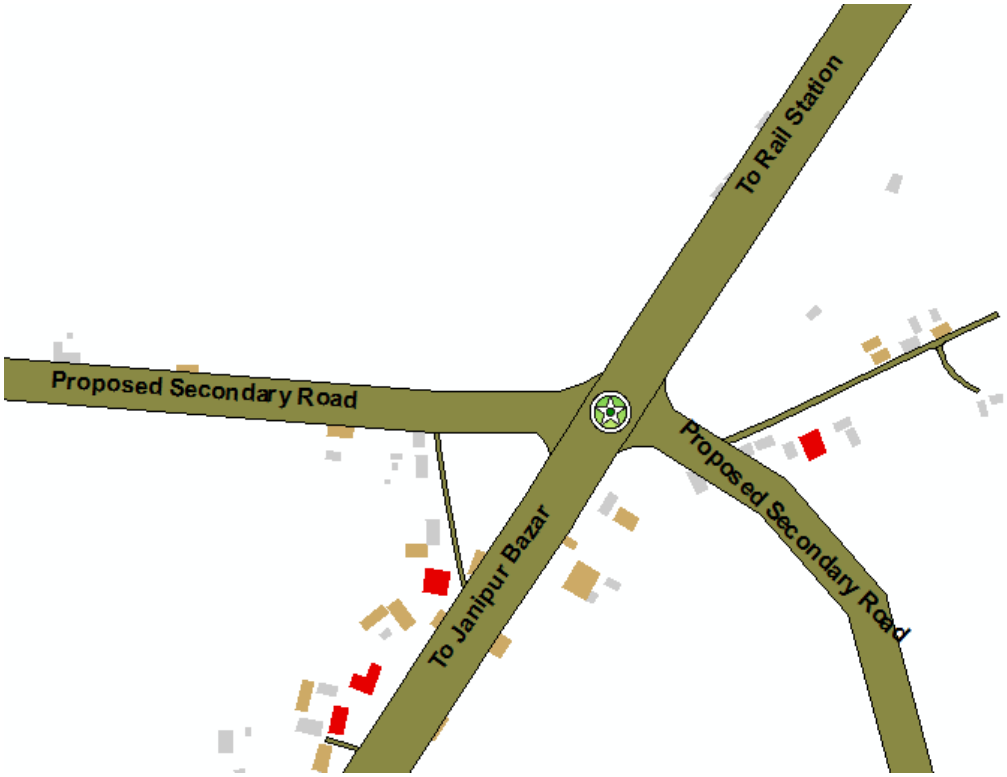


Figure 12. 11: Proposed Roundabout at Thana Mor

Central Divider

Central divider on five roads is proposed with a view to avoid conflict between both-way movements of vehicular traffic on same road. Details are shown in **Table-12.12** below.

Table 12.12: Proposal for Central Divider

Sl. No.	Alignment	Length (m)
01	Rajbari Road to Kushtia Road, PR-1	2629.4758
02	Station to Janipur Bazar Road, SR-1	3155.495
03	Proposed Circular Bipass road, SR-2&3	3054.1305
04	Proposed Secondary Road, SR-4	1528.896
Total		**10367.9973**

12.4.3 Traffic Signs and Signals

Traffic signs and signals are required in order to provide for the safe and orderly movement of motorized and non-motorized traffic and pedestrians. These provide information about routes, directions, destinations and points of interest. They also provide information on regulations, which apply to specific locations or at specific times, and warn of hazards, which may not be evident. When a traffic sign is correctly used, the majority of motorists will comply with the posted regulation or warning, and drive in a safe and orderly manner. In order to minimize the rate of traffic conflict the following signs and signals should be provided at the key location considering the prevailing traffic situation and traffic management option.

- ✓ Warning signs
- ✓ Regulatory signs
- ✓ Speed limit signs
- ✓ Bus and cycle signs and road markings
- ✓ On-street parking control signs
- ✓ Road markings
- ✓ Motorway signs and signals
- ✓ Direction signs on all-purpose roads
- ✓ Information signs
- ✓ Traffic signals
- ✓ Zebra crossings
- ✓ Signs for road works and temporary situations

12.4.4 Waterway Development/ Improvement Options

Gorai River has not enough navigability for water transportation. Therefore, waterway development or improvement option is not suggested for Khoksa Paurashava.

12.4.5 Railway Development Option

Khoksa is connected with Kushtia, Khulna, Rajshahi, Dhaka etc. areas with rail connectivity. A large number of people use railway for transportation. But, no further development options are proposed for Khoksa Paurashava.

Map 12.3: Transportation Facilities Map of Khoksa Paurashava

12.5 Transportation System Management Strategy (TSM)

The strategy for street layouts must start with considering pedestrian movement rather than vehicular movement. This approach ensures greater consideration of pedestrians, cyclists and public transport users. In many instances, all users can comfortably share the same street network.

12.5.1 Strategies for Facility Operations

- Direct walking and cycling routes to local facilities such as shops, schools, public transport, and open spaces, together with lighting and landscaping of such routes
- The planting of appropriate street plantation
- Protect environment and improve health by building and investing in public transport and other types of efficient and sustainable transport which minimize emissions and consumption of resources and energy
- Strict vigilance should be in force in order that no one can cut the earth from the embankment and shoulders of the road and nothing is done to cause harm to the embankment and shoulders
- The people should be motivated to give up the use of the iron rim for the tractor, and wooden frame for the cartwheel drawn by cows or buffaloes - instead they should be encouraged to use rubber wheels
- People should be encouraged not to overload the bus and additionally, they should also be informed about the hazards of trucks loaded beyond their carrying capacity to dissuade them from such practices
- Care should be taken to dissuade people from digging irrigation canals on the shoulder or slope

12.5.2 Strategies for Traffic Flow and Safety

- Links to the overall road network in the town, including bus services, based on an analysis of the need for such linkages
- Maximum accessibility for pedestrians and cyclists
- Circulation routes for public transport within the area
- Consideration of provision for low design speeds (such as 30 kph) and facilities for pedestrians and cyclists
- Automated traffic signals to improve traffic flow and road safety
- Introduction of temporary signs to provide information to road users to enable safe and convenient travel
- Restricting movement of heavy vehicle though the residential zone during specific periods
- Provision for prescribed shoulder on either side of the road

- The roads should be kept free from all unauthorized obstructions. In this regard, all markets, shops, Billboards, utility lines such as telephone lines, street lights, electricity poles, gas connection lines etc. must be relocated
- Undesirable hump on the road, if exists, should be removed. In case of speed needs to be regulated, then the hump should be replaced by rumble strips
- Measures should be taken to prevent water stagnation of on the road surface
- Kilometer posts are put up on each road in accordance with the approved design, drawing and specification

12.5.3 Strategies for Traffic Management

- Enhancements to enable more effective use and management of existing physical infrastructure. These enhancements typically include better road markings, signs, traffic signals, channelization at intersections, turn restrictions and separation barriers, space for bus stops, and parking or waiting areas for public transport vehicles
- Initiatives to improve the ability of road users (motorists and pedestrians alike) to adopt behavioral patterns which lead to more efficient and safer transport services. Typically, this will involve programs to alter community attitudes and invoke a greater willingness to accept better discipline by all users and providers of the transport services
- Improved testing and licensing procedures for all drivers and re-training for offending drivers. Since most drivers work for someone else, the influence that owners exert by either condoning or reinforcing poor driving habits or insisting and demanding good driving habits is substantial and should not be under estimated
- Increased level of enforcement of traffic rules to ensure a greater compliance with community desired road user behavior. Enforcement actions can involve formal policing as well as informal pressure on individuals to adopt community norms of behavior and should include the involvement of community leaders

12.5.4 Plan Implementation Strategies

12.5.4.1 Regulations to implement the Transportation Plan

The Transportation Plan for Khoksa Paurashava will be regulated and implemented by the Paurashava authority along with LGED and Roads & Highways Department. These authorities should exercise the following Ordinance, Rules and Policy to implement the transportation plan.

The Motor Vehicles Ordinance, 1983 can be exercised by the respective authorities to control and scrutinize the movement pattern of motorized traffic in Khoksa Paurashava. It includes licensing of conductors of stage carriage or contract carriage, registration of motor vehicles, control of transport vehicles, construction, equipment and maintenance of motor vehicles, control of traffic, and insurance of motor vehicles against third party risks, offences, penalties and procedure.

The Motor vehicle rules, 1997 is designed to ensure the road safety, which can also be exercised by the authorities. The center of attention of these rules is design and

specification of the length and height of motorized vehicles and repair of break down vehicles.

Another government's policy for the transport sector is spelt out in the National Land Transport Policy approved in April 2004. The policy objectives include provision of safe and dependable transport services, and improving the regulatory and legal framework. The policy is designed to play an important role in helping reduce the transport costs of goods for export and in keeping the costs of Bangladeshi goods competitive in the world market. The policy also introduces an integrated multimodal transport system, linking road, rail and water transport. Under the last government a draft Integrated Multimodal Transport Policy was prepared but has not yet been approved. It is designed to build upon the Land Transport Policy and help in achieving more rational and balanced investments across transport modes and achieve better coordination among them.

On the other hand, the Paurashava Authority should practice the 'Local Government (Paurashava) (Amended) Act, 2010' to ensure safe and sustainable transport service for the inhabitants.

The respective authorities will ensure 'Sustainable Transportation Management Plan' for Khoksa Paurashava through exercising all of these rules, ordinance and policy frameworks.

12.5.4.2 Implementation, Monitoring, Evaluation and Coordination of the Plan

The implementation, monitoring and evaluation strategies of Structure Plan have been illustrated in Chapter-9 of Part-A. The Transportation and Traffic Management Plan should also be implemented, monitored and evaluated under the same strategy by strengthening capacity of the Paurashava and forming a Monitoring and Evaluation Committee (MEC).

As The Transportation and Traffic Management Plan is a mid-term plan with a period of 20 years (2011-2031), it will be implemented on phase wise according to priority. The proposals have been prioritized based on the most urgent transport needs, since Bangladesh is a least developed country and it has a very limited budget for infrastructure development. Besides, the Paurashava Authority itself is not capable of financing this huge cost.

The Transportation and Traffic Management Plan will be implemented gradually following prioritized transport proposals including roads, central divider, roundabout etc. Phasing of proposals was done based on the priority. The Phase-I of the proposals, to be also incorporated in the Ward Action Plan, will be implemented within first 5 year (2011-2016) of the plan period. The consultants have proposed Phase-II of the proposals to be implemented after first 5 years succeeding the recent past Ward Action Plan. The details of phasing are shown in **Table-12.13**. After each 5 years the Plan will be evaluated; updated and new Ward Action Plan will be formulated under the changing circumstances.

Table 12.13: Phasing of Proposed Roads (2011-2031)

Phase-I			Phase-II		
ID	**Road Type**	**Alignment**	**ID**	**Road Type**	**Alignment**
LR-01	Local Road	Peheldanga Road	PR-01	Primary Road	Widening of the existing Rajbari-Kushtia Road
LR-03	Local Road	Within Ward 2	SR-01	Secondary Road	Widening of the existing Station to Janipur Road
LR-05	Local Road	Within Ward 2	SR-02	Secondary Road	Rajbari-Kushtia Road to Station to Janipur Road over Peteldanga Road
LR-06	Local Road	Within Ward 2	SR-03	Secondary Road	Rajbari-Kushtia Road to Station to Janipur Road
LR-07	Local Road	Within Ward 2	SR-04	Secondary Road	Rajbari-Kushtia Road to Kamalapur Road
LR-09	Local Road	Within Ward 3	LR-02	Local Road	Within Ward 1,2
LR-10	Local Road	Within Ward 3	LR-04	Local Road	Within Ward 2
LR-11	Local Road	Janipur Bazar Road	LR-08	Local Road	Within Ward 3
LR-12	Local Road	Janipur Bazar Road	LR-16	Local Road	Within Ward 4
LR-13	Local Road	Kali Bari Road	LR-17	Local Road	Within Ward 4
LR-14	Local Road	Within Ward 4	LR-20	Local Road	Within Ward 4,5,7,8,9, ext3
LR-15	Local Road	Matpara road	LR-25	Local Road	Within Ward 5,7
LR-18	Local Road	Within Ward 2,4	LR-29	Local Road	Within Ward 6
LR-19	Local Road	Within Ward 4, ext 2	LR-30	Local Road	Within Ward 6
LR-21	Local Road	Within Ward 5	LR-33	Local Road	Within Ward 6,7
LR-22	Local Road	Thana Road	LR-35	Local Road	Within Ward 8,9
LR-23	Local Road	Kamlapur Road	LR-37	Local Road	Within Ward 8,9
LR-24	Local Road	Within Ward 5	LR-40	Local Road	Within Ward ext 1
LR-26	Local Road	Within Ward 6	LR-41	Local Road	Within Ward ext 1
LR-27	Local Road	Within Ward 6,7	LR-42	Local Road	Within Ward ext 1
LR-28	Local Road	Within Ward 6,7,8,9	LR-43	Local Road	Within Ward ext 1
LR-31	Local Road	Matpara road	LR-44	Local Road	Within Ward ext 1
LR-32	Local Road	Within Ward 6,7,8			
LR-34	Local Road	Within Ward 8			
LR-36	Local Road	Within Ward 8,9			
LR-38	Local Road	Akterpur Road			
LR-39	Local Road	Within Ward ext 1			
LR-45	Local Road	Within Ward 3			

Plan implementation strategy depends on Monitoring, evaluation and coordination of a plan. Monitoring checks the plan is being implemented properly or not. 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 Khoksa 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 Khoksa Paurashava, the implementation, monitoring, evaluation and coordination phase of Transport Management Plan will be seriously affected. The Paurashava should have built its own capacity to ensure the ‘Transportation Management Plan’ properly.

Chapter 13

Drainage and Environmental Management Plan

This is the third Chapter of Part-B (Urban Area Plan) of the Final Master Plan for Khoksa Paurashava, which comprises **Drainage and Environmental Management Plan**. This Chapter has been further subdivided into two parts titled under **Part-I: Drainage Plan** and **Part-II:**

Environmental Management Plan.

The Drainage Plan has been formulated with the aim of reducing drainage congestion, water logging and urban flooding. This part seeks the options for retaining the natural drainage system as well as linking the surface drains (manmade drain) to the channel network and retention ponds. An integrated drainage network is the ultimate goal of this plan.

Part-II of this Chapter comprises Environmental Management Plan that has been formulated for ensuring a sustainable living and working environment for the Paurashava dwellers. This Part entails detailed plans and proposals for protection and conservation of natural and built environment including water bodies, ecology, flora and fauna etc. and pollution control in the light of policies and guidelines set in the structure plan.

Part-I: Drainage Plan

13.1 Introduction

The purpose of the Drainage Plan is to make an assessment of the present drainage facilities and the scope for future development within 6.84 square kilometer study area of the Khoksa Paurashava that consists of partially developed commercial, residential area and infrastructure. The purpose of the survey was to gather information available and use them at the time of the preparation of the Drainage Plan that shall act as a guiding document for designing of drains in future. This Drainage Plan shall be a planning tool and shall be used as a guideline for Khoksa Paurashava that shall be responsible for the approval of drainage improvements. In the past, the term drainage included only the hydrologic and hydraulic aspects for discharge of storm runoff. Perhaps the most pressing challenge that now a days we face include the management of our water resources and flood hazard, maintain a continuous supply of water for industrial, agricultural, transportation, recreation, and potable water for present and future generations. The Drainage Plan aspects shall also include the flood and water resources management and pollution abatement. The Drainage Plan will propose improvements necessary to the major drainage systems to accommodate storm runoff of the Khoksa Paurashava. This planning process will consider both structural and nonstructural techniques to reduce the effect of the storm runoff which may be summarized as follows:

i) Improvements to major drainage outfalls

ii) Improvement of the drainage network

iii) Management of available water resources

iv) Conservation of existing natural drainage channels

13.1.1 Goals and Objectives

Following are the overall objectives of the drainage plan of Khoksa Paurashava:

a. To allow smooth drainage of storm water and the waste water of the town.

b. To develop a comprehensive drainage network with area coverage and capacity.

c. To prevent encroachment to natural drainage system.

d. To create awareness about disposing of solid waste in the drainage system.

13.1.2 Methodology and Approach to Planning

Preparation of the Drainage Plan involves (I) analyzing the existing conditions related to drainage facilities and the flood management (II) identifying major drainage outfalls and on the basis of the outfalls splitting the total drainage area into a number of drainage zones (III) defining all pertinent design criteria and (IV) defining drainage facility requirements and sizing.

The drains are designed to collect excess rainfall that comes as surface runoff from urban area, convey the runoff and finally discharge them to outfalls. The design of drains involves hydrological computations of rainfall intensity, its frequency of occurrence, duration etc., and the total runoff of a particular catchment area. The US Soil Conservation Service (SCS) method shall be used as an alternative of the Modified Rational Method for larger catchment areas. In Modified Rational Method, the overall watershed is divided into zones that contribute to hydraulically significant points of concentration. The boundary of the zones is established based upon local topographic boundaries such as streets, existing drainage systems, etc., using good engineering practice.

13.2 Existing Drainage Network

13.2.1 Introduction

For the preparation of Drainage Plan, survey started through field reconnaissance and review of available document related to the study area. The Khoksa Paurashava and its adjacent area have been visited several times to identify the sources of flooding, existing drainage pattern, flood flow pattern and geographical position of the study area. Field trips have also been carried out to identify the infrastructures, rivers, canals, beels, ponds etc., those required to be surveyed for preparation of maps. It is investigated whether any Drainage Plan has been prepared by any other agency. The Mayor of Khoksa Paurahava informed that no such plan has been prepared earlier.

13.2.2 Existing Drainage System/ Network

Drainage Network Survey

The drainage system of Khoksa Paurashava has been surveyed and classified into two categories: (i) unlined natural khals and man made canals act as primary drain and reservoir (ii) earthen shallow secondary drains and brick masonry secondary and tertiary drains. There is one river situated within the Paurashava area, but there are three canals situated within the Paurashava area (**Map 13.1**).

Table 13.1: List of River & Canal in the Study Area

River/ Canal Name	Flow Direction	Length (km)	Area (acres)	Alignment
Gorai River	Towards North-South	2.34	166.95	Boundary line Ward Nos. 4,5,7,8 & 9
Canals	Towards South-East	4.68	17.72	Boundary line Ward Nos. 2, 3, 4, 6 & 9

Source: Field Survey, 2008-2010 by DDC

The secondary and tertiary drains are man made brick drains, surveyed and shown in the **Map-13.1**. These drains are constructed by Paurashava from their Annual Development Program fund. Within the Paurashava total 10.57 km drains so far constructed. The secondary and tertiary drains so far constructed in Paurashava are listed in **Table 13.2** below.

Table 13.2: List of Secondary Drains in the Study Area

No.	Drain ID	Location	Type	Length (m)	Width (m)	Depth (m)	Ward No.
01	20	Ward 3 (Charpara) Internal Drain	Pucca	175.5	0.50	1.00	3
02	0,1 & 30-42	Beside Upazila Health Complex	Pucca	1108.88	0.50	1.00	3
03	44 & 45	Beside Degree College	Pucca	137.16	1.00	1.00	3
04	10 & 26	Beside Union Parishad	Pucca	412.9	0.80	1.00	2
05	4 & 8	Ward 2 Internal Drain	Pucca	82.5	0.70	1.00	2
06	15,16,27,28,45 & 46	Ward 4 Internal Drain	Pucca	698.24	0.80	1.00	4
07	5, 18 & 19	Ward 5 Internal Drain	Pucca	655.92	1.00	1.00	5,6
08	11	Ward 6 Internal Drain	Pucca	893.4	1.00	1.00	6
09	3,7,13 & 14	Ward 7 internal drain	Pucca	710.36	1.00	1.00	7,8
10	6,12,23 & 24	Ward 8 internal drain	Pucca	1120.42	1.00	1.00	8

Source: Field Survey, 2008-2010 by DDC

Map 13.1: Existing Drainage Network in Khoksa Paurashava

13.3 Analysis on land level (Topography)

13.3.1 Land Levels/Spot Levels

The Total Station (TS) based surveys were conducted for measuring the spot levels/land levels of the project area (Northing, Easting, Elevation or RL). Later on these spot levels were used for generating the contour of the project area. In general the spot levels on the land were taken approx. at 10 meter intervals.

Total 313 spot values were collected for the study area. A contour line/contour joins points of equal elevation (height) above mean sea level. A digital elevation map (Map 13.2) is illustrated with contour lines which show valleys and hills, and the steepness of slopes. The contour interval of a contour map is the difference in elevation between successive contour lines. The lowest spot height is 8.90 m PWD and the highest spot height is 12.19 m PWD. Around 31.87% of the spot heights are between 3 m to 7 m and average height of land of the surveyed area is 10.88 m PWD. Details statistical summary of land levels survey are shown in **Table 13.3** and **Table 13.4** below.

Table 13.3: Spot Value and Spot Unit

No.	Spot Unit	Value (meter)
01	Total Spot Number	313
02	Average Spot Height	10.88
03	Maximum Height	12.19
04	Minimum Height	8.90
05	Variance	15.31
06	Standard Deviation	0.55

Source: Topographic Survey by DDC, 2008-2010

Table 13.4: Spot Interval and Frequency

No.	Spot Interval	Spot Number (Frequency)	Percentage (%)
01	< 10.00	18	5.64
02	10.01 – 10.50	61	19.33
03	10.51 – 11.00	93	29.80
04	11.01 – 11.50	100	31.87
05	11.51 <	41	13.23
Total		4610	313

Source: Topographic Survey by DDC, 2008-2010

13.3.2 General Contour Descriptions

Khoksa Paurashava is a land of mixed topography. From the spot level readings having the x, y and z values being determinant for the study area, a contour map of the study area has been drawn (Map 13.1, digital elevation map of the study area). It was observed that except Ward Nos. 2 and 5 all Wards have found the highest elevation. The contour lines were generated without road spots to find out the exact view of elevation. Lowest elevation was found on natural features (Canal, Pond and Khal) in different Wards of the Paurashava. In preparing the map, the vertical interval of the contours was taken as 0.3m. Mauza wise variations of spot height are depicted in Table 13.5. Project area appears to be no exception as the present contour survey reveals.

Table 13.5: Variation of Spot Height According to Ward

Ward No.	Less Than 10.00 m	10.01 m - 10.50 m	10.51 m - 11.00 m	11.01m - 11.50 m	11.51 m - 12.00 m	12.01 m - 12.50 m	Average
01	9	38	58	28	5	0	10.66
02	0	12	16	22	2	0	11.36
03	0	13	35	16	9	0	10.87
04	0	2	9	9	8	2	11.23
05	0	0	5	8	1	0	11.1
06	9	28	35	6	0	0	10.48
07	0	6	11	6	2	0	10.8
08	0	0	2	5	4	0	11.33
09	0	0	8	10	10	0	11.28
Total	**18**	**99**	**179**	**110**	**41**	**2**	**11.01**

Source: Topographic Survey by DDC, 2008-2010

Map 13.2: Digital Elevation Map of Khoksa Paurashava

13.3.3 Analysis of peak runoff and identification of drainage outfalls

The size and shape of the catchments or sub-catchments for each drain shall be determined by plan meter from topographic maps and by field survey. In determining the total runoff of a catchment area the following assumptions to be made:

i) The peak rate of runoff at any point is a direct function of the average rainfall intensity for the Time of Concentration to that point.

ii) The recurrence interval of the peak discharge is same as the recurrence interval of the average rainfall intensity.

iii) The Time of Concentration is the time required for the runoff to become established and flow from the most distant point of the drainage area to the point of discharge.

Regarding runoff discharge, it has been observed that there is no river existed in the Khoksa Paurashava. But, there are six canals within the Paurashava. That is the only natural drainage channels which receives part of the runoff volume from part of the town.

The Total Paurashava area has been divided into 6 drainage zones based on analysis of topography, slope, natural and manmade catchment divides and the channel/detention pond (Beel/Doba). Catchment area of these drainage zones/sub-catchment is given in Table 13.6. Outline of these zones along with outfall name has been shown in Map 13.2.

Table 13.6: Drainage Zones with Outfall Location

Zone-ID	Name of Outfall	Catchment Area (Acre)
Zone-01	Ponds & Ditches	92.565
Zone-02	Ponds & Ditches	105.543
Zone-03	Khal	400.478
Zone-04	Gorai River	464.462
Zone-05	Khal	238.419
Zone-06	Khal	389.762
Total		**1690.507**

Map 13.3: Drainage Network Proposal Plan of Khoksa Paurashava

13.4 Plan for Drainage Management and Flood Control

13.4.1 Plan for Drain Network Development

Sustainable drainage network system, an alternative to conventional drainage is introduced to mimic natural drainage, with the aim of reducing flooding and improving the quality of water draining from urban surfaces (runoff). A comprehensive drainage network is developed leaving the existing beels and ponds to remain their natural form. The entire Paurashava area is divided into several drainage zones based on topographic condition, natural and manmade drainage divides e.g. roads. There are only three small canals in the area. The marshlands and large ditches are proposed to be connected with the respective catchment area through manmade primary and secondary drains. These drains would receive runoff from other secondary and tertiary drains falling into them and from the land phase of the catchment area.

Drain Network Plan

Drainage network plan is intended primarily for flood mitigation, water logging and erosion control. It comprises of the proposed new drains along with improvement of existing drainage structures, embankment and sidewall. Outfall locations of each existing and proposed drain were designated after assessing the flow direction of existing canal network and land slope.

Proposal for improvement of the existing drain networks

In order to drain out the anticipated future peak runoff to be generated from rainfall due to increase in impervious land cover as well as built-up areas and to mitigate the vulnerability of rainfall induced flooding and water logging, some existing secondary drains have been identified for improvement. The details of improvement of identified existing drains are shown in Table 13.7.

Table 13.7: List of drains for proposed improvement

ID	Existing Type	Proposed Type	Location	Existing Width (m)	Proposed Width (m)
20	Pucca	Secondary Drain	Ward 3 (Charpara) Internal Drain	0.50	0.762
0,1 & 30-42	Pucca	Secondary Drain	Beside Upazila Health Complex	0.50	0.762
44 & 45	Pucca	Primary Drain	Beside Degree College	1.00	1.524
10 & 26	Pucca	Primary Drain	Beside Union Parishad	0.80	1.542
4 & 8	Pucca	Secondary Drain	Ward 2 Internal Drain	0.70	0.762
15,16,27,28,45 & 46	Pucca	Primary Drain	Ward 4 Internal Drain	0.80	1.542
5, 18 & 19	Pucca	Primary Drain	Ward 5 Internal Drain	1.00	1.542
11	Pucca	Primary Drain	Ward 6 Internal Drain	1.00	1.542
3,7,13 & 14	Pucca	Primary Drain	Ward 7 internal drain	1.00	1.542
6,12,23 & 24	Pucca	Primary Drain	Ward 8 internal drain	1.00	1.542

List of proposed new drains

For effective functioning of existing drainage network, some new drains has been proposed in the project area which is listed in **Table-13.8**. The list has been prepared based of analysis of topographic map, existing drainage network, field visits and consultation with the Paurashava officials and local people. The proposed drains along with existing drains and other drainage infrastructures are shown in **Map 13.2**.

Table 13.8: List of proposed new drains

Type	ID	Ward no.	Width (m)	Direction	Outfall	Length(m)
Primary Drain	PD-01	Ward 1	1.524	NE-SW	Khal	1364.80
	PD-02	Ward 2	1.524	SE-NW	Khal	1175.99
	PD-03	Ward 4	1.524	NE-SW	Gorai River	740.14
	PD-04	Ward 7	1.524	E-W	Gorai River	920.01
Secondary Drain	SD-01	Ward 1	0.762	E-W	Khal	373.94
	SD-02	Ward 2	0.762	S-N	Khal	571.41
	SD-03	Ward 2	0.762	NE-SW	Khal	402.93
	SD-04	Ward 2	0.762	N-S	PD-02	624.21
	SD-05	Ward 3	0.762	N-S	Khal	487.92
	SD-06	Ward 4	0.762	N-S	Gorai River	524.12
	SD-07	Ward 5	0.762	NE-SW	Gorai River	569.82
	SD-08	Ward 8	0.762	E-W	Gorai River	799.47
	SD-09	Ward 9	0.762	E-W	Gorai River	388.27
Tertiary Drain	TD-01	Ward 1	0.457	N-S	PD-01	242.21
	TD-02	Ward 2	0.457	S-N	SD-03	420.27
	TD-03	Ward 2	0.457	E-W	SD-02	220.03
	TD-04	Ward 2	0.457	N-S	PD-02	284.08
	TD-05	Ward 2	0.457	NE-SW	PD-02	463.32
	TD-06	Ward 3	0.457	W-E	Khal	201.03
	TD-07	Ward 4	0.457	E-W	SD-06	347.44
	TD-08	Ward 4	0.457	E-W	SD-06	246.34
	TD-09	Ward 4	0.457	NW-SE	PD-03	157.11
	TD-10	Ward 4	0.457	E-W	Gorai River	196.42
	TD-11	Ward 5	0.457	E-W	PD-03	245.88
	TD-12	Ward 5	0.457	E-W	PD-03	218.34
	TD-13	Ward 6	0.457	E-W	SD-07	397.05
	TD-14	Ward 6	0.457	E-W	SD-07	260.33
	TD-15	Ward 7	0.457	N-S	PD-04	343.17
	TD-16	Ward 8	0.457	E-W	Gorai River	357.12
	TD-17	Ward 8	0.457	N-S	SD-09	1364.80
Total Length						**13543.159**

List of Infrastructure measures for Drainage and Flood Control Network

Box Culverts and cross drains along with proposed drains and roads should be established in the appropriate location for smoth flow of rain water.

13.5 Plan Implementation Strategies

13.5.1 Regulations to implement the Drainage and Flood Plan

A common scenario in an uncontrolled urbanization is that flood plain occupation by the population takes place, in a sequence of years with small flood levels. When higher flood levels return, damage increases and the public administrations have to invest in population relief. Structural solutions have higher costs and it is feasible only when damages costs are greater than their development or due to intangible social aspects and redevelopment.

The Ministry of Water Resources, through its implementing arm-the Bangladesh Water Development Board (BWDB), implements the flood control and drainage (FCD), flood control, drainage and irrigation (FCDI) and other development projects. It prepares and implements development projects relating to FCD/FCDI projects; riverbank erosion control; delta development and land reclamation; etc. and provides irrigation, drainage, flood protection, bank erosion protection, land reclamation facilities by constructing barrages, regulators, sluices, canals, cross-dams, embankments and sea-dykes along the banks of the rivers and the coast, etc.

Regulations prescribed in the National Water Policy, 1999 is proposed as the legal basis for implementing the Drainage and Flood Plan. The National water policy, promulgated in 1999 provides policy direction for water sector. Under the NWPo, WARPO has been made secretariat to the National Water Resources Council (NWRC) and is responsible for preparing the NWMP and subsequent updates, and monitoring implementation. Agencies are responsible for preparing their own sub-regional plans within the framework established by NWMP.

Flood Action Plan was finalized in November 1989 comprising 26 components as an initial stage (1990-95) in the development of a long term comprehensive system of flood control and drainage works in Bangladesh. The Action Plan included project-oriented studies in all of the country's main regions along with supporting activities to promote better project design and execution. Thus, Flood Action Plan can be exercised as a legal framework for implementing the Drainage and Flood Plan.

The principal national institution concerned with flood management is the BWDB. The Joint River Commission (JRC) and BWDB carry out international and regional data and information exchange. BWDB disseminates all kinds of flood information to all related Government Departments and Organizations.

Flood management relating to water management at national level is co-coordinated by the National Water Council and the Ministry of Water Resources. Flood management relating to disaster management is co-coordinated by the National Disaster Management Council, particularly by the Ministry of Disaster Management and Relief. Over-all coordination during the flood event is the responsibility of the latter Ministry and the Inter-Ministerial Disaster Management Committee.

13.5.2 Implementation, monitoring, Evaluation and Coordination of the Plan

The implementation, monitoring and evaluation strategies of Structure Plan have been illustrated in Chapter-9 of Part-A. The Drainage Plan should also be implemented, monitored and evaluated under the same strategy by strengthening capacity of the Paurashava and forming a Monitoring and Evaluation Committee (MEC).

The Drainage Plan is of 20 years (2011-2031), it will be implemented on phase wise according to priority. The proposals have been prioritized based on the priority needs, since Bangladesh is a least developed country and it has a very limited budget for infrastructure development. Besides, the Paurashava Authority itself is not capable of financing this huge cost.

The Drainage Plan will be implemented gradually following prioritized Drainage proposals including improvement of existing drain, proposed new drain, bridges/culvert, cross drain etc. Phasing of proposals was done based on the priority. The Phase-I of the proposals, to be also incorporated in the Ward Action Plan, will be implemented within first 5 year (2011-2016) of the plan period. The consultants have proposed Phase-II of the proposals to be implemented after first 5 years succeeding the recent past Ward Action Plan. The details of phasing are shown in **Table-13.9**. After each 5 years the Plan will be evaluated, updated and new Ward Action Plan will be formulated under the changing circumstances.

Table 13.9: Phasing of Proposed Drains (2011-2031)

Phase-I						Phase-II				
Type	ID	Ward No.	Width (m)	Length (m)		Type	ID	Ward No.	Width (m)	Length (m)
Primary Drain	PD-01	Ward 1	1.524	1355.573		Tertiary Drain	TD-01	Ward 1	0.457	243.032
	PD-02	Ward 2	1.524	1172.385			TD-02	Ward 2	0.457	242.812
	PD-03	Ward 4	1.524	719.041			TD-03	Ward 2	0.457	419.292
	PD-04	Ward 7	1.524	918.552			TD-04	Ward 2	0.457	190.906
Secondary Drain	SD-01	Ward 1	0.762	528.555			TD-05	Ward 2	0.457	282.997
	SD-02	Ward 2	0.762	375.101			TD-06	Ward 3	0.457	399.772
	SD-03	Ward 2	0.762	544.157			TD-07	Ward 4	0.457	393.024
	SD-04	Ward 2	0.762	405.983			TD-08	Ward 4	0.457	351.219
	SD-05	Ward 3	0.762	627.576			TD-09	Ward 4	0.457	226.991
	SD-06	Ward 4	0.762	547.512			TD-11	Ward 5	0.457	169.629
	SD-07	Ward 5	0.762	801.014			TD-12	Ward 5	0.457	233.154
	SD-08	Ward 8	0.762	495.868			TD-13	Ward 6	0.457	217.611
	SD-09	Ward 9	0.762	509.412			TD-14	Ward 6	0.457	394.542
Tertiary Drain	TD-10	Ward 4	0.457	153.378			TD-15	Ward 7	0.457	259.883
	TD-16	Ward 8	0.457	336.274			TD-17	Ward 8	0.457	364.386

With regards to plan implementation strategy 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 Khoksa 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.

Part- II: Environmental Management Plan

13.6 Introduction to Environmental Management Plan

13.6.1 Goals and Objectives

Following are the overall objectives of environmental management plan:

a. To create a sustainable living environment.

b. To create awareness among citizens about livable environment.

13.6.2 Methodology and Approach to Planning

The environmental management plan consists of the Supplementary Living Environment Survey, the Comprehensive Ecological Survey and the Water Quality Survey. The Supplementary Living Environment includes water supply, land pollution, sewerage and sanitation, solid waste management, and resettlement of population due to construction of canals and primary drains. The Comprehensive Ecological Survey aims at facilitating comprehensive environmental assessment by subsequent urbanization and implementation of the drainage on the ecological elements of fauna and flora, agricultural and aqua cultural resources etc. The Water Quality Survey is the sampling and analysis of surface water from rivers, natural canals, ponds etc., and from ground water. These are required to be done to ensure necessary urban environment enhancement measures. Moreover, an overall evaluation of environmental condition due to urbanization with flood management and drainage is required in order to justify the necessity of the Drainage Plan. In planning process special attention required to reduce the insect breeding areas, and preserve and management of natural drainage area.

13.7 Existing Environmental Condition

13.7.1 Introduction

The urban environment of the Khoksa Paurashava includes both build and natural environment. Build environment includes waste management, water, air quality, energy usage, transport network, slum improvement, and disaster mitigation. The urbanization where the build environment overburdens the natural environment cannot be sustainable. But urbanization is vital for countries economic growth. Urban centers concentrate services, infrastructure, labor, knowledge, entrepreneurship and markets.

So in every phase of planning processes all these environmental issues will be evaluated and proper measure will 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 mitigation etc.

13.7.2 Geo-morphology

Topographically, Khoksa Paurashava is a plain land. The plain land mainly consists of fluvio-deltaic sediments deposited by the Ganges river x`systems. Geomorphologically, Khoksa Paurashava falls under the Floodplains of the Ganges River having distinguishing character.

13.7.3 Solid Waste and Garbage disposal

The solid waste and Garbage disposal of Khoksa Paurashava includes household waste, industrial waste, kitchen market waste, clinic/hospital waste, latrine waste, brickfield waste and fertilizer/chemical related waste. The production of solid waste in Khoksa per person per day is around 260gm and the total Paurashava production is 4.76 ton/day. The household waste is thrown to roadside drains or open spaces adjacent to the houses. The Garbage from kitchen market and untreated hospital waste from UHC disposed to open space by the side of the road, drain or ditch and polluting living environment which is a great threat to human health.

13.7.4 Waste Management System

Though the Paurashava has recently launched the provision of solid waste management, the facility is yet scanty to accommodate the prevailing needs. The solid waste management system of Khoksa Paurashava comprises 4 dustbins, 1 Garbage truck, no push cart/ rickshaw van and no waste disposal site of its own. And, the whole system is assisted by 6 workers those are temporarily appointed by The Paurashava authority.

13.7.5 Pollutions

Water

In nature water is available both from the surface and underground. The sources of surface water of Khoksa Paurashava like ponds, ditches and khals are being contaminated from improper sanitation, solid waste disposal, improper treatment and disposal of hospital waste, use of chemical fertilizers, poisonous insecticides, etc. The sanitation coverage is claimed 100% by the Paurashava authority. The rest inhabitants of the Paurashava, uses katcha latrines, open latrines and hanging latrines. The human excreta from improper sanitation come in contact with sources of water and water bodies especially during rainy season. Hospital waste is another source of water contamination. In the Paurashava there is an Upazila Health Complex (UHC), and some private pathological laboratories. They are producing contaminated hospital wastes. The UHC and others have neither specific land to bury their wastes nor any incinerator to burn them. The hospital wastes are thrown to nearby open spaces, ditches and roadside drains with other wastes. The Paurashava has poor solid waste collection system and covers the insignificant portion of the total area. In most cases the solid wastes are dumped in open spaces, road side drains, ditches, near bridges and culverts etc. The decomposed market and kitchen waste produce highly polluted leached where they are dumped and flows to adjacent land. During rainy season it comes in contact with rain water, some percolate into the ground and the rest flows to water bodies and thus contaminates the nature's water system. Another source of water pollution is use of chemical fertilizer in agricultural land. The pollution from agrochemicals in water bodies and river has reached at alarming levels. The long-term effects of this water contamination by inorganic substances, many of them toxic, are incalculable. It is affecting the marine and aquatic ecosystems and the chemicals are entering into the food chains, which have public health implications.

Ground water is the only source for the supply of safe drinking water to the inhabitants of the Paurashava. The Paurashava has no water supply network. Neither the Paurashava nor DPHE has any record nor census of hand tube wells within the Paurashava. The

ground water table of the Paurashava varies from minimum 6ft during rainy season to maximum 22ft during winter. The ground water of Khoksa Paurashava is heavily loaded with iron. Hand tube wells contain iron and other harmful minerals and are main cause for most of the chronic intestinal diseases. Moreover, during winter the level of ground water table goes down and concentration of iron in ground water increases. Another probable source of ground water pollution may be the arsenic contamination. Arsenic is mostly found in water harvested from the upper and mid aquifers. Arsenic was first detected in groundwater in Bangladesh in 1993. For identifying whether the extracted ground water is arsenic contaminated or not the DPHE is working for. The DPHE identified few tube wells contaminated by arsenic in Khoksa Paurashava. The contaminated hand tube wells were abandoned and new wells were constructed in those places.

Air

The main sources of air pollution of the Paurashava are emission of harmful gaseous matters from vehicles, lack of proper solid waste management system, industrial sector, construction, and wood and biomass consumption etc. Due to rapid urbanization of the Paurashava the total number of motorized vehicles including bus, truck, tempo, three wheeler, etc., has been increased. These automobiles on the road are very old, overloaded and poorly maintained and emit smoke far exceeding the prescribed limit. Dumping of Garbage to open land and ditches allows the objectionable odor of Garbage to spread in air. Industrial development within the Paurashava is another major source of air pollution. The Saw Mills are spreading dust in air. The smoke from the chimneys of rice mills and bakery are increasing carbon dioxide content and polluting the air. Polluted air is harmful for human health depending on the nature of the pollutant, concentration, duration of exposure and the state of health and age group of the recipient. Apart from impact on human health, air pollution has detrimental impact on the ecosystem, vegetation and livestock. A continuous monitoring is necessary to evaluate air quality for the development plan to mitigate the health risk from air pollution. The type of industries and their number within the Paurashava is listed in **Table 13.10** below:

Table 13.10: Number of Industries in Khoksa Paurashava

Sl. No.	Type of Industry	Number	Pollutant	Effluent treatment plant
01	Rice Mill	4	Harmful gases	Not require
02	Oil Mill	1	No	Not require
03	Saw Mill	6	dust	Not require
04	Bakery & Flour Mill	1	Harmful gases	Not require
Total		**12**		

Source: Field Survey, 2008-2009 by DDC

Sound

Sound pollution is quite significant in Khoksa Paurashava. There is a railway station within the Paurashava. The Khoksa railway station produces high noises and it is one of the main sources of noise pollution. There are altogether 12 number light and cottage industries which include oil mills, saw mills, husking mills, bakeries, ice factories and light engineering workshops. Out of them saw mills and engineering workshops produces low noises. The moving vehicles also produce noise. In market days traffic load increases near rice mills and bazar areas. The population of public carrier is relatively high during bazaar

days in Khoksa and they produce moderate level of noise. Also there are carpentry shops, tailoring shops and blacksmith shops in residential areas those are producing noise.

Arsenic

The ground water of Khoksa Paurashava is heavily loaded with iron. Hand tube wells contain iron and other harmful minerals and are main cause for most of the chronic intestinal diseases. Moreover, during winter the level of ground water table goes down and concentration of iron in ground water increases. Another probable source of ground water pollution may be the arsenic contamination. Arsenic is mostly found in water harvested from the upper and mid aquifers. It is of natural origin coming from sedimentary materials containing the arsenic in potentially soluble forms. It is believed to be released to groundwater under reducing conditions. Arsenic was first detected in groundwater in Bangladesh in 1993. The DPHE identified few tube wells contaminated by arsenic in Khoksa Paurashava. The contaminated hand tube wells were abandoned and new wells were constructed in those places.

13.7.6 Natural Calamities and Localized Hazards

Cyclone

Although Bangladesh is cyclone prone area, yet Khoksa Paurashava is out of range of tropical cyclone which occur mainly the coastal areas of Bangladesh. And Khoksa Paurashava is also free from Nor'werters and Tornadoes. The Nor'werters, severe seasonal storm locally known as Kalbaishakhi occurs during pre-monsoon season. Severe Nor'westers is generally associated with tornadoes. Tornadoes are suddenly formed and are extremely localized in nature and of brief duration.

River Erosion

River Erosion is not a major problem for Khoksa as there is no river situated in the Paurashava area. The increase in rainfall in summer is apprehended due to climatic change and the current deforestation in tern increase the surface erosion of land.

Flood

The Gorai River flows from the Western boundary of Khoksa Upazila. But, Khoksa Paurashava is not affected by any kinds of flood.

However, during rainy season few places of the Paurashava become water logged. However, a flood zoning map and location of Khoksa is provided here in **Map-12.4** where Khoksa falls under the flood free zone.

Earthquake

An earthquake is the result of a sudden release of energy in the Earth's crust that creates seismic waves. The seismicity or seismic activity of an area refers to the frequency, type and size of earthquakes experienced over a period of time. The north and north easterly part of Bangladesh is the most active seismic zone and had experienced earthquakes of moderate to high intensity in the past.

Bangladesh has been divided into three generalized seismic zones: zone-I, zone-II and zone-III. Zone-III comprising the Southern regions of Bangladesh, is a zone of low seismic

risk with a basic seismic co-efficient of 0.03. Khoksa Paurashava falls under this zone which is considered as the less vulnerable seismic zone of Bangladesh.

Water Logging

The water logging created also in some build up areas. In most cases, where water logging occurs the housing are at lower elevation than the road level. During monsoon when the rainfall intensity is very high, the remaining water after infiltration and evaporation retains on the ground where water logging occurs. Due to lack of drainage facility water retains there until it dries up. In some areas water logging condition prevails for weeks together. Water logging problem starts in June and continues until end of October.

Fire Hazard

Fire hazard is any situation in which there is a greater than normal risk of harm to people or property due to fire. Khoksa often faces a range of disaster events including flood, drought, fires and other man-made hazards. Fire inevitably causes upheavals not only in the physical but also in the social and economic context where they occur. Although a fire disaster need not necessarily reach catastrophic proportions, it will present some of the characteristic aspects of a disaster because of the highly destructive action of fire and of the considerable number of victims.

Generally fire causes the great loss of life and property in any urban areas. Dense building concentration, narrow roads, flammable building materials, aging water supply and electrical system, as well as the lack of resources to upgrade preparedness and response skills have resulted in the growing risk of large scale, multiple structure fires.

Fire incidents in shops, industrial and commercial buildings cause heavy toll of life and property. The fire incidents are on an increase due to lack of awareness, almost no feeling for following safety measures and practicing fire fighting drills, violation of building codes and non-compliance with the fire checking and extinguishing law.

As per the record of Paurashava office of Khoksa up till now fortunately the rate of fire hazard is very negligible in Khoksa Paurashava. Presence of flammable building material and use of fire wood and kerosene for cooking purposes often causes danger.

Other Hazards

Cyclone, River erosion, Earthquake, Water logging, Fire etc. are the type of hazards, which occasionally affect the land of Khoksa Paurashava with minimum scale. Any hazard other than mentioned above is not yet identified at Khoksa Paurashava Town area.

13.8 Plan for Environmental Management and Pollution Control

13.8.1 Proposals for Environmental Issues

Solid waste management Plan

Solid waste management is not yet an environmental problem in the town because of low density of population and low consumption rate. But in future population will rise and density will increase. So solid waste will pose a major environmental problem in future. It is better to take precautionary measures now to avoid any future hazard.

A waste disposal ground is proposed at the extreme Middle-East side of the Paurashava for final dumping of solid waste in order to ensure a habitable environment and to keep the urban environment free from pollution. To solve the solid waste management problem door to door collection program should be introduced. The Paurashava authority along with NGO's and CBO's will collect wastes from the households and storage points daily. The van will move into the wards and whistle to announce its arrival. The same vehicle will cover other institutions, societies, complexes. Thus the system will cover the whole town and will transfer the waste to the proposed waste transfer stations. After that, the Truck/Van of the Paurashava will dump the wastes to the proposed waste disposal ground. A minimum charge will be fixed by the Paurashava authority for waste collection to the inhabitants. The total process is exposed under Figure 13.2. The list of Waste Transfer Stations and Waste Disposal Ground is listed in Table 13.11.

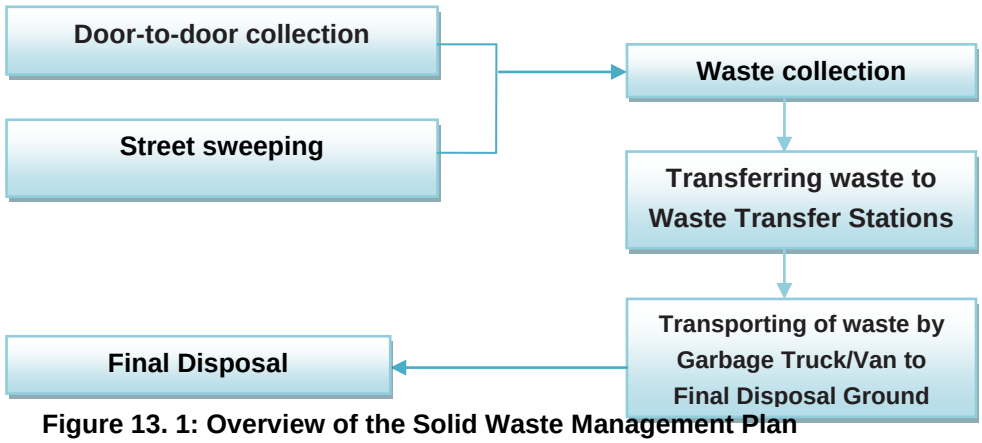


Figure 13. 1: Overview of the Solid Waste Management Plan

Table 13.11: List of Proposed Waste Disposal Facilities

ID	Type of Facilities	Location	Ward No.	Area (Acre)	Mouza Schedule	
					Mouza	Plot No.
WDG	Waste Disposal Ground	At the East side of the Paurashava	Ward 6	6.486	Maligram	612-632, 634, 643, 650-669, 671, 673, 776, 1789, 1802
WTS-1	Waste Transfer Station	Beside Station to Janipur Bazar Road	Ward 1	0.25	Buzruk Mirzapur	2255
WTS-2	Waste Transfer Station	Near Proposed Secondary Road	Ward 2	0.25	Khoksa	220
WTS-3	Waste Transfer Station	Middle side of the Paurashava	Ward 6	0.26	Khoksa	2658

Mitigation Measures

1. Introduction home collection system.
2. Creation of solid waste transfer stations at important locations.
3. Creation of a dumping site for disposal of solid waste.
4. Use of sanitary land fills method for treatment of waste at the dumping site.

Plan for protecting open space, wet-land and relevant features

Open Space Promotion

Currently there is no open space in Khoksa Paurashava. If the plan is implemented by the year 2021, the ratio will be 1.27 acres per thousand populations. But there will be hardly any scope to provide further open space. So, the provision of open space must be implemented in the study area for the greater interest of the future urban dwellers.

Mitigation Measures

1. The open space provisions have to be implemented to save future town environment.
2. Adequate fund is needed to be allotted to execute open space development.
3. No plan should be allowed in locations of open space as per plan.
4. Landowners may be motivated to donate land for open space development.

Wetland Protection

Most of the natural khals flowing through the town have been encroached by land hungry people. At many places the khals have been filled up. All these activities are causing khals to get squeezed lowering their capacity to drain enough water during monsoon. If this trend continues, it will increase flood risk and water logging in the low-lying town.

Mitigation Measures

1. Strict measures should be taken to recover state property from encroachers.
2. Wherever land fill has been done, re-excavation has to be done to recover khals.
3. Marking pillars should be set up to mark Khas lands of the khal area.
4. Vegetation may be created along the Khal creating buffer zone between khal and the private property.

Proposals for Pollution Control

Industrial

Industrial pollution is an important issue of the day and it is getting more and more monstrous. There is also a need to raise general awareness among common people. It is one of the aims of planning to create a physical environment that will be congenial to the individual family and community and to establish a physical environment that will effectively promote economic development. This face to the measures to tackle the pollution issue within a community is one of the targets of planning. As this leads to the safer and healthier environment.

In order to keep the residential and commercial area free from industrial pollution, an industrial zone comprising of general and heavy industry is proposed at the Middle side (Beside Peteldanga Road) of the Paurashava. This zone will occupy an area of 32.119 acres and all the existing industries, incompatible with the living environment, are proposed to be rehabilitated into this zone. There will be distinct area for general industry (Green and Orange a Category) and heavy industry (Orange B and Red Category) with proper treatment plant.

The possible means that can be adopted to minimize the pollution may include:

- Proper zoning.
- Improvement of living conditions location of industrial units on proper sites.
- Protection of residents from industrial pollution by means of buffer zoning.
- Raising awareness among people.
- Arranging community programs to take pollution issue.

For the purpose of controlling industrial pollution local level steps can be very much effective. The best way to tackle urban problems is through integrated action. The following steps can be taken:

- Encourage industrial settlements within the municipality
- Shift all industrial units outside the residential area.
- Before establishing new industrial units they should be bounded to assume that they will try to minimize the factors affecting environment.
- Pollution causing industries should be penalized.
- Repeated checking of industrial units should be made to ensure that effluents of industries are within acceptable limits.

Following are the three important ways which are adopted for controlling the location of industries:

- By developing industrial zones
- By granting concessions; and
- By imposing restrictions.

Treatment methods for industrial wastes will depend upon their characteristics and various other factors. In general, treatment recommended should be such that it recovers some useful substances from the industrial wastes. This will encourages the industry owner for the suitable treatment to the industrial wastes and it will also reduce the cost of such treatment.

Air/Water/Land/Sound

Air

Every day, the average person inhales about 20,000 liters of air. Every time we breathe, we risk inhaling dangerous chemicals that have found their way into the air.

Air pollution includes all contaminants found in the atmosphere. These dangerous substances can be either in the form of gases or particles.

Air pollution can be found both outdoors and indoors. Pollutants can be trapped inside `buildings, causing indoor pollution that lasts for a long time.

The sources of air pollution are both natural and human-based. As one might expect, humans have been producing increasing amounts of pollution as time has progressed, and they now account for the majority of pollutants released into the air.

As there is no heavy industries releasing toxic air pollutants such as CFC, heavy metals, SPM etc. and the number of automobiles plying over the town is at a minimized level, no pollution control or regulatory measures for Khoksa Paurashava is proposed in the plan.

Water

Water pollution is the contamination of water bodies (e.g. lakes, rivers, oceans and groundwater). Water pollution occurs when pollutants are discharged directly or indirectly into water bodies without adequate treatment to remove harmful compounds.

Water pollution affects, plants, and organisms living in these bodies of water; and, in almost all cases the effect is damaging not only to individual species and populations, but also to the natural biological communities.

Water pollution can be controlled in the multiple ways. It is best controlled by the dilution of water. The pollutants must be treated chemically and must be converted into the non toxic substances. The low level of radioactive wastes in the water is removed by the oxidation of ponds. There are certain chemicals which act on the organic insecticide and are used in the pesticide. There are different techniques which are very helpful in the process of thermal pollution and involve the cooling, evaporation, water cooling; cooling can be wet or dry. Their main aim is to keep the water cool in rivers and streams. The shallow ponds must be used to store the domestic and industrial wastes. One must avoid the large ponds. The waste has a presence of sunlight and organic nutrients which may lead to the larger growth of bacteria which act on the waste matter. The reclaimed polluted water can be used in making fertilizers as it is rich in phosphorous, potassium and nitrogen. It can also be used for the irrigation and factories purposes. The proper sewage treatment plans play a crucial role in the reclaimed polluted water. There must be a law which ensures that the industries must treat the waste before the water is discharged into the rivers and seas. The polluted water can be treated by the use of a plant known as water hyacinth which is also referred as kaloli. It deals with the biological and chemical waste. The heavy metals are also removed by it.

Land

Land pollution is the degradation of Earth's land surfaces often caused by human activities and their misuse of land resources. It occurs when waste is not disposed properly. Urbanization and industrialization are major causes of land pollution.

Land pollution is the deposition of solid or liquid waste materials on land or underground in a manner that can contaminate the soil and groundwater, threaten public health, and cause unsightly conditions and nuisances.

The waste materials that cause land pollution are broadly classified as municipal solid waste, construction and demolition waste or debris, and hazardous waste. MSW includes nonhazardous Garbage, rubbish, and trash from homes, institutions (e.g., schools), commercial establishments, and industrial facilities. Garbage contains moist and decomposable (biodegradable) food wastes (e.g., meat and vegetable scraps); rubbish comprises mostly dry materials such as paper, glass, textiles, and plastic objects; and trash includes bulky waste materials and objects that are not collected routinely for disposal (e.g., discarded mattresses, appliances, pieces of furniture). C&D waste (or debris) includes wood and metal objects, wallboard, concrete rubble, asphalt, and other

inert materials produced when structures are built, renovated, or demolished. Hazardous wastes include harmful and dangerous substances generated primarily as liquids but also as solids, sludge, or gases by various chemical manufacturing companies, petroleum refineries, paper mills, smelters, machine shops, dry cleaners, automobile repair shops, and many other industries or commercial facilities.

Sound

Sound pollution is a serious issue for many companies. Although the long-term effects of sound pollution have not yet been determined as of the time of publication, the Environmental Protection Agency states that sound pollution has been linked to high blood pressure, sleep disruption and hearing loss. While some industries are noisier than others, it is generally necessary to institute at least some sound pollution controls in any workplace, particularly if the noise limits exceed the accepted decibel level.

Sound pollution reduction/controlling measures:

- Construction of sound proof rooms for noisy machines in industries.
- Use of horns with jarring sounds to be banned.
- Sound producing industries and railway stations to be shifted away from the inhabited areas.
- Proper law should be enforced to check the misuse of loudspeakers and public announcements systems.
- To enforce silence zones near schools/ colleges, hospitals etc.
- Growing green plants/trees along roadside to reduce sound pollution as they absorb sound.
- Loud speakers are banned for certain time limit.

Other Pollution

Any pollution other than mentioned above is not yet identified at Khoksa Paurashava Town level.

13.8.2 Natural calamities and hazard mitigation proposals

Flood, Tornado and Earthquake are the usual hazards applicable for Khoksa Paurashava. In order to address the flood hazard the following points are to be considered carefully and protection plans are to be prepared:

- Rainfall Intensity
- Storage Coefficient
- Runoff Coefficient and
- Catchment Area

Since there is susceptibility to water logging, drainage structures e.g. drains, excavation of canals, culverts etc. are required for this Paurashava. Moreover, houses should be constructed so that the plinth level is elevated enough above a certain level for a return period of at least 10 years to safeguard water logging.

Regarding Tornado and Earthquake prior information to the people by means of weather forecasting and seismological information will be of helpful.

Plan for addressing Natural Calamities (Structural and non structural measures)

Natural Calamities e.g. tornado, or earthquake etc. that affects the environment, and leads to financial, environmental and/or human losses. The resulting loss depends on the capacity of the population to support or resist the disaster, and their resilience. This understanding is concentrated in the formulation: "disasters occur when hazards meet vulnerability." A natural hazard will hence never result in a natural disaster in areas without vulnerability, e.g. strong earthquakes in uninhabited areas. The term natural has consequently been disputed because the events simply are not hazards or disasters without human involvement.

Plan for addressing hazards (Structural and non structural measures)

National Plan for Disaster Management 2010-2015 has been prepared in April, 2010 aiming at reducing vulnerability of the poor to natural, environmental and human-induced disaster to a manageable and acceptable level. There will be a plan for Paurashava titled “Paurashava Disaster Management Plan” to be prepared by the “Paurashava Disaster Management Committee” having linkages with the National Plan for Disaster Management.

Plan for addressing encroachment leading to hazards

The term encroachment is only applicable for flood hazard. It has been observed that few people construct their houses, go-downs, stores, business premises farms or industries in an un-authorized manner by encroaching the drains, khals and river area, which make hindrance the natural flow of water. During the excessive rain the surface water become obstructed by those un-authorized encroachment and create water logging and flood. Thus, all type of un-authorized encroachment should be removed.

13.9 Plan Implementation Strategies

13.9.1 Regulations to implement the Environmental Management Plan

The first major law that has been promulgated for the specific purpose of protection of environment and conservation of nature is the Environmental Conservation Act (ECA) of 1995, which was followed by the Environmental Conservation Rules (ECR) of 1997.The Environmental Conservation Act of 1995 empowered the MOEF to formulate rules and guidelines for the management. It also designates DOE responsible for enforcing the 1997 EIA procedures air pollution, water pollution, noise. Environmental Conservation Rules of 1995 was also formulated to control air pollution, water pollution and noise. These Acts and Rules are effective instrument for combating air pollution, water pollution and noise.

Under the Environment Conservation Rules, 1997 the industrial units and projects are, in consideration of their site and impact on the environment, classified into the four categories, e.g. Green, Orange-A, Orange-B and Red for the purpose of issuance of Environmental Clearance Certificate. So the Paurashava can exercise this rule for issuance of Environmental Clearance Certificate to ensure industrial development compatible with living environment.

The Motor Vehicles Ordinance, 1983 and the Motor vehicle rules, 1997 can be exercised by the respective authorities to control emission of harmful gases and toxic metals from mechanized.

The conservancy section of the Paurashava will monitor the waste management system regularly and practice the 'Local Government (Paurashava) (Amended) Act, 2010' to make sure the management of solid waste disposal for better environment.

Preparation of regulations, strategy and plan documents is a requirement in most policy documents of the government. However, there are no modalities or guidelines to be followed after adoption and/or approval of a policy document. There is also no mechanism for monitoring the progress of implementation of policies within or outside the concerned Ministries. As a result, the sponsoring Ministry takes steps in their own ways of considerations.

Bangladesh is overwhelmingly dependent on environmental and natural resources, but the economic and societal forces at work coupled with other natural and technical factors, may have already seriously eroded the natural resource base of the country, which could have serious adverse impact on output, income and employment. In order to address these issues, the government has approved the National Environmental Management Action Plan in 1996. The National Environmental Management Action Plan was formulated through a massive consultative process involving grassroots workshops, regional workshops and professional and expert group workshops. The Plan has prioritized several actions on the environmental front and the government is in the process of creating a second-order priority list for immediate implementation of National Environmental Management Action Plan.

The action plan was prepared in four steps:

Step - i. Identification of the major concerns

Step - ii. Listing and synthesis of major issues (done in 1993).

Step -iii. Recommendations for actions based upon recommendations made by the peoples themselves as well as the professional groups and the government (done in 1994).

Step-iv. Prioritization of the actions based upon the views expressed by the people, professionals and government agencies.

13.9.2 Implementation, monitoring, Evaluation and Coordination of the Plan

It should be mentioned that implementation is the carrying out or execution of a plan. So in the implementation stage we should be particular about the monitoring, Evaluation and Coordination of the plan. The progress of project, the problems it is facing and the efficiency with which it is being implemented should be properly monitored and in the evaluation stage to be assesses the extent to which the project produced the intended impacts. Moreover, coordination among different organizations and authority is also necessary. A monitoring and evaluation committee headed by the Mayor of the Paurashava should be formed for effective implementation, monitoring, evaluation and coordination of the plan.

Chapter 14

Plan for Urban Services

14.1 Introduction

The Urban Services element describes how the Paurashava maintains, improves, and provides adequate public services. Public services the city provides include water supply, sanitation, solid waste, telecommunication, electricity and gas supply.

One of the most important functions of the Urban Area Plan is to assure that adequate public facilities are provided to meet the needs of all people and developed lands within the city. To ensure a high quality of life, existing facilities must be maintained and improved. In addition, expanding these public services and facilities is necessary for urban development and economic growth. A complete range of public utilities is available to support urban development.

This section of the chapter describes the urban services development proposals for future development of the Khoksa 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 environmental conditions throughout most of the urban areas are very poor. Improvement in the delivery of these services will require significant changes in current practices, strategies and availability of investment funds.

The Plan seeks to create a resource management approach that maintains a high environmental quality while providing for the development, use, and maintenance and upgrading of urban services to meet the reasonable needs of the urban population of Khoksa Paurashava.

13.1.1 Range and Content of the Urban Services

Urban services contents a number of items which are often confused or over lapping with Public Utilities and Community services. However, the following are the Urban Services:

- Water supply
- Sanitation
- Telecommunication
- Electricity and
- Gas supply

14.2 Analysis of Existing Condition and Demand for Services

14.2.1 Introduction

One of the major challenges in the urban sector is the promotion of planned growth of individual towns irrespective of its size. It is necessary to evolve an institutional arrangement to undertake planning exercises in each urban center. The physical development of each individual town should be planned to embody efficiency, productivity,

beauty and environmental sustainability. Efficiency is related to functional aspects of towns to be achieved through physical planning and providing basic urban services with emphasis on equity. Considering the total area and population, the level of urban services of Khoksa Paurashava is unsatisfactory and do not fulfill the demand.

14.2.2 Analysis and projection on existing and proposed Urban Services

a) Analysis of existing urban services

Analysis of existing urban services such as Water supply, Sewerage, Electricity, Gas supply, Solid waste, Telephone etc. are listed below:

Water Supply

There is no water supply network for distribution of safe drinking water to its inhabitants of Khoksa Paurashava. The water table within the Paurashava ranges from 6 ft to 22 ft and is lower during the summer. Khoksa Upazila falls within the river basin of the Padma that serves for good recharge of the ground water. As a result, the inhabitants of the Paurashava do not face any difficulty of getting drinking water from hand tube wells in summer. The water supply within the Paurashava is by hand tube wells. 100% people of the Paurashava uses hand tube wells as source of drinking water. The DPHE and CARE are working with other NGOs for investigating drinking water quality of hand tube wells. They collect water samples from both newly constructed as well as in operation hand tube wells for investigating the arsenic level and other minerals of ground water. However, within the Paurashava any arsenic contaminated hand tube well not yet identified. Nevertheless, the Paurashava nor the DPHE has any record of how many hand tube wells are within the Paurashava at present. Most of the poor people in urban periphery has no hand tube well of their own. They use pond water for household purpose and collect water from neighbors' hand tube wells for drinking purpose.

Sewerage and Sanitation

Khoksa Paurashava has no sewerage network, only there are few sanitary latrines with septic tank and soak pit. According to Socio-economic, it is about 49.70% households were lacking the sanitation facilities; 30.60% households had hygienic sanitation facilities and 19.70% households were under insanitary sanitation practices. As per the information given from Khoksa Paurashava Authority, the Paurashava up to December, 2008 had distributed sanitary equipment to 2251 families out of the families deprived of sanitation facilities. Such an incentive has brought the percentage of hygienic sanitation practices up to 63.60% from 19.70%. But, still it is about 16.60% inhabitants lack the sanitation facilities. The DPHE and Paurashava are the main implementing agencies for sanitation projects whereas the UNICEF, WORLD VISION, BRAC, Proshika, etc. are the co-partners in different sanitation programs.

Electricity

The Rural Electrification Board (REB) is assigned for the supply of electricity to Khoksa Paurashava. The Power Development Board (PDB) is absent here. The Area Office of the Pally Biddut Shamity (PBS) is responsible for distribution of electricity to the Khoksa Paurashava. The PDB has so far given 384 No commercial connections to different shops, offices, services etc., 118 No connections to rice mills, saw mills, ice cream factories and other cottage industries, 54 connections to agricultural equipments and 2112

No connections to its holdings within the Paurashava. During winter demand is higher when cottage industries and agricultural equipments are in operation. Moreover, the supply is not uninterrupted. Load shading is a common problem. The main constrains for new connections are deficiency in supply and lack of distribution line.

Gas supply

The natural gas supply has not yet brought in Khoksa Paurashava. People use mainly firewood for cooking purpose as the fire wood is cheaper and more available in market. However, the rolled stick made from paddy husk as a substitute of firewood also is becoming more popular now a day. A small percentage of people mostly of elite classes use liquefied petroleum gas (LPG) for cooking. The vehicles use diesel and petrol as fuel which are mainly sold from small roadside shops. There is no petrol pump within Khoksa Paurashava area.

Telephone

The Bangladesh Telecommunication Company Limited (BTCL) the only land telephone service provider in Khoksa Paurashava. The Grameen Phone, City Cell, Bangla Link, and Robi are the mobile phone companies operating in Khoksa Paurashava. The BTCL has 256 line capacity digital telephone exchanges and it has so far provided 240 connections.

b) Projected Urban Services

An overview on projection of urban services such as Water supply, Electric substation, Gas, Solid waste disposal site and Telephone exchange are given below:

For forecasting demand for utility services an appropriate method is chosen based on the nature of the data available and the desired nature and level of detail of the forecasts. An approach often used is to employ more than one method and then to compare the forecasts to arrive at a more accurate forecast. There are several methods used worldwide for forecasting utility services (e.g. water supply, electricity) demand. But these methods are not applicable due to the lack of data. There are more techniques used for forecasting demand for other utility services but not applicable to the project context. So, it is better to predict demand of utility services using planning standard. According to 'Planning Standard' of Upazila Towns Infrastructure Development Project, provide by LGED; one acres of area is required for per 20000 populations. On the other hand, projected population of Paurashava for the year 2021 will be 20742 persons. Maintaining the ratio of distribution according to planning standard, 1.04 acres of land will be required for water supply system to meet up the demand. Following table shows demand of utility services, which have been calculated considering both the planning standard and projected population (Table 14.1).

Table 14.1: Projected Urban Services

Urban Services (utilities)	Projected Area Under Urban Services (in acre) for 2021
Telephone Exchange	0.52
Electric Sub Station	1.04
Garbage Disposal	5.00
Waste Transfer Station	0.75
Water Supply	1.04
Total	8.35

14.3 Proposals for Urban Services and Implementation Strategies

14.3.1 Introduction

The purpose of urban service plan is to provide information about the actual and forecast the future development of urban services. In this section a details proposal and implementation strategies for urban services are incorporated. **Map 14.1** shows proposed environmental and urban services for Khoksa Paurashava.

14.3.2 Proposals for Urban Services

Proposal for Water Supply

According to Ground Water Zoning Map of Bangladesh, the Ground Water Level of Khoksa Paurashava is 5.3m-7.6m during dry season (BADC, 2010).

As the Paurashava has no connections to its residents, so to meet the domestic water requirement of the inhabitants of Paurashava a deep tube well is proposed with proper surface water treatment. In this regard, the population of 2021 (20742 nos.) is considered. The capacity of a deep tube well is assumed to be 50 liter/sec for average aquifer condition and pumping hour of Deep Tube Well to be 12 hrs/day. According to Human Development Report of UNDP, domestic water requirement is assumed to be 46 lpcd (UNDP, 2006). To forecast the daily domestic water requirement of the Paurashava, following method is used.

Calculation:

Per-capita Water Consumption	: 46 liter/capita/day
Discharge rate of DTW	: 50 liter/sec
Projected Population of Khoksa Paurashava in 2021	: 20742 person
Amount of Water needed by projected population	: (46x20742) liter/day
	= 954132 liter/day

Deep tube well needed to meet the requirement of the projected population

= 954132 / (50x3600x12) nos.

= 0.44 nos. ≈ 1 nos.

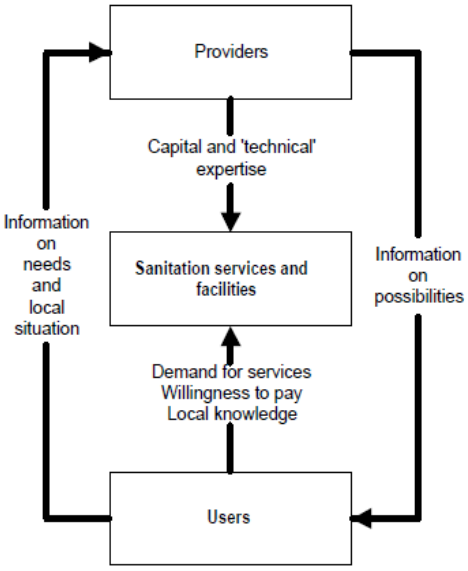
According to Paurashava, the minimum level of ground water is 25ft. - 30ft. at dry season and the ground water contains very high iron at the level from 60ft. to 200ft. Ground water at a depth of above 200ft. is good enough in terms of both quality and quantity to meet the requirement of domestic water supply of the Paurashava.

Proposal for Sewerage

To install and maintain the sewerage network involves huge cost and it also encompass massive technical support, so the respective authorities are not capable of bearing such expenditure and it is unrealistic.

Proposal for Sanitation

Sanitation can be defined as a system for promoting sanitary health conditions. The goal of environmental sanitation should be to ensure that people lead healthy and productive lives and the natural environment is protected. Increased funding for the Paurashava may succeed in implementing effective sanitation programs.



In order to provide sanitation facilities two broad approaches can be undertaken. One approach is to focus on supply - what the providing organization can deliver. The second is to base actions on what people want, in other words on their demand for services. As only 30% sanitary latrine is pucca and only 19.70% latrine is semi-pucca, so proper sanitation facility should be offered by the Paurashava authority along with other NGO's by following the strategies of sanitation development.

The provision of public toilet is also an important issue for ensuring sanitation facility to the people outside residence. Seven public toilets are proposed at different location of the Paurashava, listed in **Table 14.2**. Public toilet should be designed as gender friendly in order to address the gender issues along with introducing written signs or pictograms of a man and a woman.

Table 14.2: List of Proposed Public Toilet

Sl. No.	Type	Location	Ward No.	Area (acre)
PT-1	Public Toilet	Near Rail Station	Extn. Area 1	0.107
PT-2	Public Toilet	Near Peteldanga Road	Ward 2	0.092
PT-3	Public Toilet	Beside Rajbari-Kushtia Road	Ward 2	0.164
PT-4	Public Toilet	Near Station to Janipur Bazar Road	Ward 3	0.187
PT-5	Public Toilet	Near Bazar Area	Ward 5	0.195
PT-6	Public Toilet	Beside Station to Janipur Bazar Road	Ward 6	0.097
PT-7	Public Toilet	South side of the Paurashava	Ward 8	0.103

Proposal for Gas supply

There is no natural gas supply in Khoksa Paurashava and the government has not yet undertaken any policy framework to supply natural gas to this Paurashava.

Proposal for Telephone

The demand of land telephone is decreasing in Khoksa Paurashava due to rapid expanding of mobile phones.

Map 14.1: Utility Services Map of Khoksa Paurashava

Proposal for Electricity

The main constraints for electricity connection are deficiency in electricity supply and lack of distribution line to each household. The PDB Office informed that within Paurashava the demand is 60 connections per month. The supply of electricity ranges from 2.00 to 2.50 Mega Watt. During winter, demand is higher when cottage industries and agricultural equipments are in operation. To solve this particular problem the Paurashava authority can encourage the inhabitants to use solar energy as an alternative and environment friendly source of electricity instead of grid-based electricity supply. Solar energy is of two categories, one is thermal energy used for heating, cooling, drying and refrigerating etc. and another is photovoltaic energy. This energy can be utilized in any location in Bangladesh. It depends on the availability of sun-ray. Solar energy may be used for generating electricity from few watts to hundreds of thousands watts ignoring the presence of conventional energy and can be interlinked with the conventional system easily. Therefore, it can be generated at any location like market, bazaar, and Paurashava complexes away from the grid and can be used there. Awareness building program should be introduced in this respect.

On the other hand, most of the time the inhabitants face higher load-shedding and low voltage in electricity supply, which disrupt the water demand for irrigation. By ensuring stabilized voltage and providing new connections to the developing areas this problem should be overcome.

Improvement of Electricity

For the improvement of electricity, we are suggesting the following two options:

1) Electric supply: In Khoksa Paurashava most of the time the inhabitants face higher load-shedding and low voltage in electricity supply, which disrupt the house hold activities, industrial production and water demand for irrigation. By ensuring stabilized voltage and providing new connections to the developing areas this problem should be overcome.
2) Solar energy: To solve this particular problem the Paurashava authority can encourage the inhabitants to use solar energy as an alternative and environment friendly source of electricity instead of grid-based electricity supply. Solar energy is of two categories, one is thermal energy used for heating, cooling, drying and refrigerating etc. and another is photovoltaic energy. This energy can be utilized in any location in Bangladesh. It depends on the availability of sun-ray. Solar energy may be used for generating electricity from few watts to hundreds of thousands watts ignoring the presence of conventional energy and can be interlinked with the conventional system easily. Therefore, it can be generated at any location like market, bazaar, and Paurashava complexes away from the grid and can be used there. Awareness building program should be introduced in this respect.

Improvement of Street Light

Street light is the responsibility of Paurashava. The Paurashava should take a program for street light on the major roads of core area and built up urban area. Major advantages of street lighting includes: prevention of accidents and increase in safety. Furthermore, lighted intersections and highway interchanges tend to have fewer crashes than unlighted intersections and interchanges. The major criticisms of street lighting are that it can

actually cause accidents if misused, and cause light pollution. Occasionally the loss of night vision because of the accommodation reflex of drivers' eyes is the greatest danger. It is not uncommon for street lights to be on posts which have wires strung between them, such as on telephone poles or utility poles.

14.3.3 Regulations to address the proposals

Water Supply and Sanitation

The Paurashava Authority should regulate the establishment of Deep Tube-well and they will ensure the water quality, surface water treatment and proper networking system through experts to meet the need of Paurashava inhabitants. The respective authority can practice 'Water Supply and Sanitation Rule, 2009' to implement the water supply network and sanitation facility, which covers both the application process for water supply and method of distribution to the inhabitants. On the other hand, the Paurashava Authority should practice the 'Local Government (Paurashava) (Amended) Act, 2010' to ensure continuous water supply to its inhabitants.

To regulate the sanitation policy the following ideas should be considered.

- People from the various organizations and groups that are involved in sanitation are brought together to consider their needs and possible responses to those needs
- What people have done for themselve will be much more effective than talking about the benefits of participatory approaches.
- Disagreements on approaches and standards should be resolved by testing the various options.

Electricity

The Paurashava authority can practice 'Electricity (Amendment) Act, 1993 (Act No.XXVIII of 1993)' to meet the demand of electricity supply, which covers both the application procedure for electricity supply and the process of distribution to the inhabitants.

Streetlights

The Paurashava Authority should practice the 'Local Government (Paurashava) (Amended) Act, 2010' to provide the streetlights in the Paurashava.

14.3.4 Implementation, monitoring and Evaluation of the Urban Services Plan

With regards to plan implementation strategy 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 Khoksa Paurashava is not equipped with qualified manpower to make such evaluation. For urban services plan monitoring and evaluation is essential. Qualified and experienced professionals of concerned departments should overlook the process of urban services. The Paurashava should have built its own capacity to ensure urban services to the inhabitants.

Chapter 15

Ward Action Plan

The third tier of the preparation of Master Plan of Khoksa Paurashava is Ward Action Plan. The Ward Action Plan prepared under the framework of Structure Plan and Urban Area Plan. The Action Plans is undertaken for each of the nine wards of the Khoksa Paurashava. This plan mainly describes the development proposals in detail as well as the prioritized schemes in the light of higher-level plan (Urban Area Plan).

15.1 Introduction

15.1.1 Backgraoud

Ward Action Plan is a vital part of the Master plan package as far as spatial development and development control is concerned. Absence of Ward Action Plan not only hampers undertaking development projects but also leads to uncontrolled and unwanted spatial development. The Ward Action Plan enables detailed view of proposed land use and development for Khoksa Town for a period of 5 (five) years with keeping in view the need over a time span of 20 years.

The provision of Ward Action Plan is inherent in the Structure Plan with some specific purposes. These are:

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

15.1.2 Content and form of Ward Action Plan

The WAP will be the smaller units of Structure Plan, expose their problems and opportunities and propose development proposals for improve of the problems as well as to promote development. Combining the areas of common use enables putting them into future uniform land use. Within the Paurashava area one ward has been considered a WAP. The WAP ensures better management of planning and development. The following indicators needed to adopt in preparation of the WAP. These are:

a) Area of Ward, b) Physical Boundary, c) Road Networks, d) Population Growth and density, e) Landuse pattern and f) Potentiality & development opportunity.

The Ward Action Plan has been contained 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. It also contains the phasing of proposals and the means of implementation. The Proposals Map show where the policies and proposals apply.

In addition to indicating the priorities, a Ward Action Plan includes proposals identified by other Agencies and bodies expected to happen within the period of the Plan. However,

any dates and costs shown against proposals are liable to change as programs and the availability of resources are revising annually.

15.1.3 Linkage with the Structure and Urban Area Plan

The Ward Action Plan is the third tier planning of the Master Plan project. As WAP has been prepared within the policy framework of the Structure Plan and guidelines of Urban Area Plan and aims to take immediate action up to five years.

The planning components of the current plan package are hierarchically related with each other. Structure Plan is at the apex level providing the long term policies and strategies for urban development. The subsequent plans that is Urban Area Plan and Ward Action Plans are prepared under the strategic and visionary guidelines of the Structure Plan. Urban Area Plan is the mid-level plan meant for the main city and the potential areas in its vicinity likely to be developed in near future. Visions and strategies expressed in the Structure Plan are translated into planning proposals in the Urban Area Plan. It is also used for development control. Ward Action Plan is the lowest level in the planning hierarchy that shows the Urban Area plan proposals and beyond. It includes development proposals at the micro level reflecting the local needs and aspirations. Detailed Area Plans also follow the proposals and guide lines of the Structure Plan and Urban Area plan.

15.1.4 Approach & Methodology

The Ward Action Plan will be guided by the policies and proposals of upper level plans that are structure plan and urban area plan. Ward Action Plan provides guidance for development where action is expected in the term and covers individual parts of a city within a variable time frame. It comprises high priority projects and programs that can be implemented in a relatively short time period, in an intensive manner.

Ward Action Plan has been directed to the situations of local area and linked to the specific problems and issues of the area have been identified after discussion with and participatory process of all the stakeholders and beneficiaries of envisaged development in the area. A program of prospective facilities and uses has been detailed out indicating target populations, service levels, financing mechanism and implementations schedules.

The methodology could be illustrated through tri-step process for the assessment of Ward Action Plan (**Figure-15.1**). These three steps are:

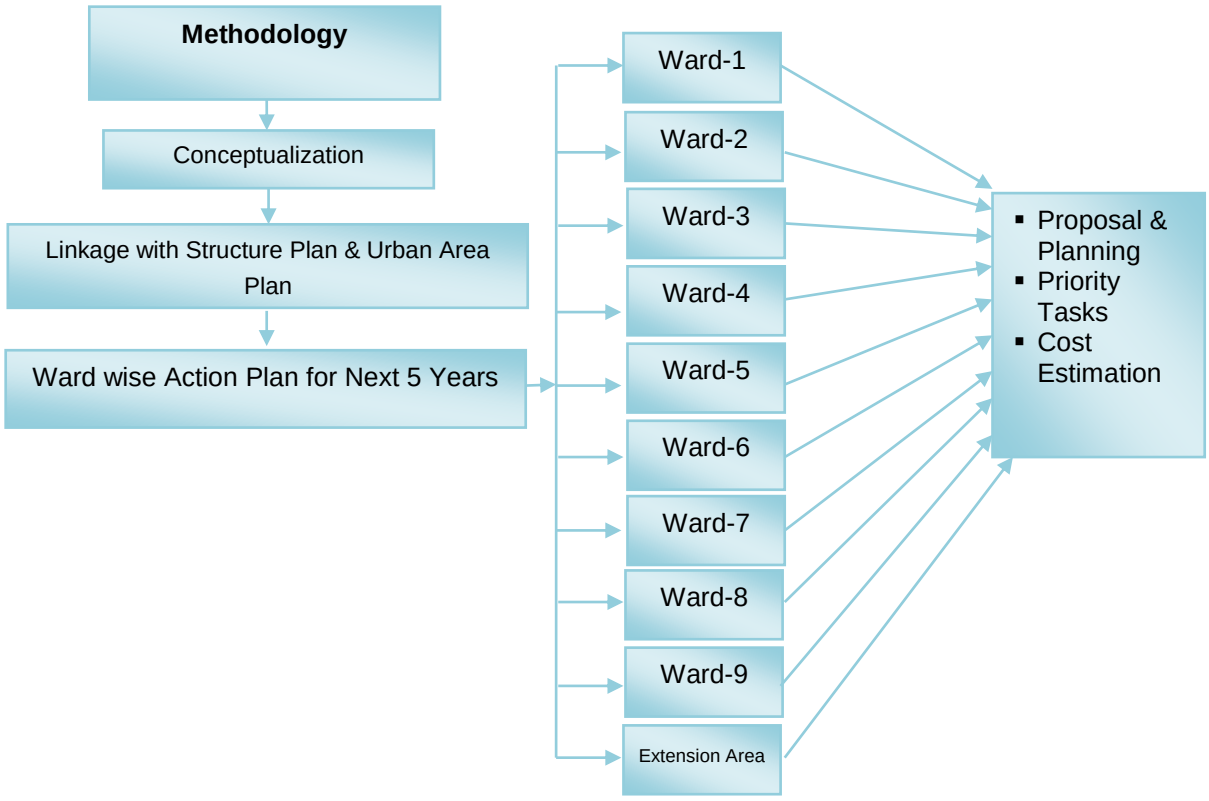


Figure 15.1: Methodology of Ward Action Plan Preparation

The first step of the methodology of Ward Action Plan is to conceptualize the content and background of the plan. In the next step, the linkage with Structure Plan & Urban Area Plan is identified. The final phase of the study is to adopt ward action plan in details. The proposal and planning, priority tasks and cost estimation are incorporated here to get a pictorial view of the Ward Action Plan.

15.2 Derivation of Ward Action Plan

15.2.1 Revisiting of Structure Plan

Structure Plan is a broad, indicative and open ended plan that contains broad policy framework for further plans and development actions. Based on the Structure Plan policy framework elaborate development proposals are prepared at subsequent lower levels.

The Structure Plan for Khoksa Paurashava will provide a long term development strategy for 20 years up to 2031 for the development of the Paurashava area of 6.84 sq km or 1690.35 acres with an estimated population around 23486. The Structure Plan area was subdivided into 10 Ward Action Plans (WAPs) on the basis of ward boundary and extension area boundary which had been considered as WAP at the lowest tier plan of this plan package. The Structure Plan covers:

- Identifies the order of magnitude and the direction of anticipated urban growth and definition of a broad set of policies considered necessary to achieve the overall plan objectives,
- Identifies areas where growth is likely to take place in future and addresses the major issues.
- Is an attempt to provide a longer term perspective that would cater to the long term needs of the projected population and
- To determine the land use pattern of the town. It marks the possible areas of future expansion.
- Provides a policy framework for future development trends.

The Structure Plan contains policies on the following topics:

- Urban Area Development
- Transport and Communication
- Sanitation and Drainage
- Water Supply
- Solid Waste Management
- Industrial and Commercial Development
- Housing
- Economy and Employment
- Tourism and Recreation
- Environment
- Conservation of Heritage

The issues under each of the above topics have been briefly discussed followed by policy recommendations along with justification and agencies responsible for implementation.

The Structure Plan will remain valid for a period of 20 years from 2011 to 2031. From the beginning of 2028 a project will have to be started to prepare a new Structure Plan for the next 20 year plan period.

15.2.2 Revisiting of Urban Area Plan

The UAP 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.

The concept of this plan focuses on the basis of an urban area plan, where mid term (up to the year 2021) development strategy is generally focused in the development planning process. Urban area Plan attempts to guide and accomplishing a coordinated, adjusted, and harmonious development of an urban center and its environs in accordance with present and future needs, best promoting health, safety, morals, order, convenience, property, general welfare, as well as efficiency and economy in the process of

development; the forecast of a town's future. This plan is the second hierarchy of the current planning package and guided by the policy proposals of the structure plan. The Plan contains-

- Broad spatial proposals and land use shown on map of desired scale;
- Written statement about land use proposals;
- Description of social-economic and environment policies;
- Sector specific plans and proposals and development standards.

15.2.3 Prioritization

Urban infrastructure Development Scheme for Paurashava aims at improvement in urban infrastructure in a planned manner.

The objectives of the scheme are to-

a) Improve infrastructural facilities and help create durable public assets and quality oriented services in Paurashava

b) Enhance public-private-partnership in infrastructural development and

c) Promote planned integrated development of Paurashava.

The components for assistance under the scheme will include all urban infrastructure development projects. The Scheme will cover the following areas

- Construction/ Up gradation of roads, highways/expressways
- Water Supply
- Solid Waste Management
- Construction and improvement of drains/storm water drains
- Parking lots/spaces on Public Private Partnership basis
- Development of heritage areas
- Preservation of water bodies.
- Health and educational institutions

On completion of the Scheme period of five years, it is expected that Paurashava will achieve the following outcomes

(a) Modern and transparent budgeting, accounting, financial management systems, designed and adopted for all urban services and governance functions

(b) City-wide framework for planning and governance will be established and become operational

(c) All urban residents will be able to obtain access to a basic level of urban services

(d) Financially self-sustaining agencies for urban governance and service delivery will be established, through reforms to major revenue instruments

(e) Local services and governance will be conducted in a manner that is transparent and accountable to citizens

(f) E-Governance applications will be introduced in core functions of Paurashava resulting in reduced cost and time of service delivery processes.

15.2.4 Ward wise Action Plan for next five years

The Ward Action Plan is spanning for the 5 years period. The Structure Plan paints the broad picture on the future pattern of housing, jobs, transport, services and the environment. Ward Action Plan is much more specific. They tackle the problems and opportunities associated with individual communities and show exactly where it apply.

The purpose of a Ward Action Plan is to -

- Guide decisions made on planning applications to ensure that new developments are right for their location;
- Help plan for the integrated develo2pment needs of an area such as new homes, factories, shops and schools;
- Provide a consistent spatial framework within which both private and public sector investment decisions can be taken;
- Protect important natural and man-made heritage features; and, most importantly, allow local people to become involved in the planning process

Ward Action Plans are developed to provide locally focused planning guidance for local areas. WAP aim to achieve the following:

- Establish a shared vision for the local area
- Address key local planning issues and capitalize on opportunities
- Sstablish an integrated approach to local planning and
- Sensibly manage future development outcomes

A WAP can override other parts of the planning Scheme where an inconsistency exists. A Ward Action Plan is prepared with the input from many stakeholders. Some of these are:

- The local and wider community;
- Prominent land owners, businesses, residents', associations, community groups and nongovernment organizations;
- Elected representatives of council (councilors) and other levels of government; and
- Representatives of relevant council programs and state government agencies

Public involvement is a key issue. To this end, the Paurashava has adopted a "Planning for Real" based approach which allows hands-on participation by all the residents of each local community. They help by identifying local issues and problems which the Plan can tackle; expressing their views on the Paurashava's policies; and suggesting how these could be improved. Ward Action Plan must be topical and relevant. The Paurashava's target is to ensure that they are reviewed on a 5 yearly cycle.

15.3 Ward Action Plan for Ward 01

15.3.1 Demography

As per the BBS 2011, this Ward had a population of 1975 persons. Population projection shows 2532 population for the year 2031. For the same year, it has a density of about 07 persons per acre (ppa) and it will be 09 ppa in 2031. Table 15.1 shows the details.

Table 15.1: Population Statistics of Ward No. 01

Item	Year	
	2011	2031
Area (acre)	282.77	282.77
Population	1975	2532
Density of Population (per acre)	7	9

15.3.2 Critical Issues and Opportunities of the Ward

This ward 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 this 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

It has the good external connectivity with surrounding upazila and district town such as Kushtia, Rajbari, Pabna and Jhenaidah.

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.

15.3.3 Proposals and Plans for Ward 01

Ward No. 01 is located at the North part of Khoksa Paurashava. The area of the Ward is 282.768 acres. After reviewing and commensurating the policies and proposals of Structure Plan and Urban Area Plan the following proposals are made in the Action Plan of Ward 01 for implementation within next 05 (five) years up to 2016. Land use proposals and proposed road, drainage and utility services plan are shown in **Map 15.1** and **Map 15.2** for this ward.

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 0.02 acres of land has been earmarked for urban residential use, which will occupy 0.01% of the total ward area.

Rural Settlement

As this Ward is rural in character, 40.61 acres of land is proposed to remain as rural settlement (14.36%) up to the year 2031.

Education and Research Zone

In Ward Action Plan, land for education and research is proposed with an area of 4.17 acres, which is 1.47% of total land of the Ward.

Commercial Zone

In Ward Action Plan, more than 0.46 acres of land has been earmarked for commercial use, which will occupy 0.16% of the total ward area.

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 17.42 acres of land and more than 6.16% of the total area.

Community Facilities

Land for community facilities encompasses by graveyard, temple, mosque etc. 0.74 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. Due to development changes of the Ward, 153.82 acres covering 54.40% 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 2.44 acres of Land is earmarked as open space for Ward no. 01. It shares 0.86% land of this Ward.

General Industrial Zone

Total 16.74 acres of Land is earmarked as General Industrial Zone for this area. It shares 5.92% of land of this area.

Heavy Industrial Zone

Total 16.76 acres of Land is earmarked as General Industrial Zone for this area. It shares 5.93% of land of this area.

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 0.25 acres will be preserved as the water retention ponds. The proposed retention area covers 23.77 acres of land, which covers almost 8.41% of the total Ward area.

The following table shows the detail location and area of New Land Development Proposal (DP).

Table 15.2: New Land Development Proposal (DP)

ID	Name of Proposal	Location	Area (acre)
NP-1	Neighborhood Park	Beside Peteldanga Road	2.442
TS-1	Tempu Stand	Beside Train Station to Janipur Bazar Road	0.237
IZ-1	Industrial Zone	Beside Peteldanga Road	16.042
IZ-2	Industrial Zone	Beside Peteldanga Road and Station to Janipur Bazar Road	16.077
WC-1	Ward Centre	Beeside Station Road	1.065

Map 15.1: Land Use Plan Map for Ward No. 01

15.3.4 Proposed Road Infrastructure Development

Total of 3556.14 meters of road development has been proposed for Ward no. 01. The detailed scenario of road network widening and new road development proposal is given in the following table.

Table 15.3: Widening and New Road Development Proposal for Ward No. 01

Ward No.	Proposed Road ID	Proposed Road Type	Proposed Width (Feet)	Proposed Status	Phase	Length (Meter)
Ward No. 01	LR_N_08	Local Road	20 ft	New Construction	2nd Phase	111.6
Ward No. 01	LR_N_09	Local Road	20 ft	New Construction	2nd Phase	77.59
Ward No. 01	LR_W_12	Local Road	20 ft	Widening	2nd Phase	3.42
Ward No. 01	PR_N_01	Primary Road	60 ft	New Construction	1st Phase	3.6
Ward No. 01	PR_N_04	Primary Road	60 ft	New Construction	1st Phase	329.93
Ward No. 01	PR_W_11	Primary Road	80 ft	Widening	1st Phase	18.19
Ward No. 01	PR_W_12	Primary Road	80 ft	Widening	1st Phase	18.33
Ward No. 01	PR_W_13	Primary Road	80 ft	Widening	1st Phase	17.49
Ward No. 01	PR_W_14	Primary Road	80 ft	Widening	1st Phase	2125.75
Ward No. 01	PR_W_15	Primary Road	80 ft	Widening	1st Phase	16.76
Ward No. 01	PR_W_16	Primary Road	80 ft	Widening	1st Phase	21.05
Ward No. 01	PR_W_17	Primary Road	80 ft	Widening	1st Phase	16.99
Ward No. 01	PR_W_18	Primary Road	80 ft	Widening	1st Phase	15.74
Ward No. 01	PR_W_19	Primary Road	80 ft	Widening	1st Phase	26.98
Ward No. 01	PR_W_20	Primary Road	80 ft	Widening	1st Phase	21.42
Ward No. 01	PR_W_21	Primary Road	80 ft	Widening	1st Phase	21.35
Ward No. 01	PR_W_22	Primary Road	80 ft	Widening	1st Phase	22.8
Ward No. 01	SR_W_05	Secondary Road	40 ft	Widening	1st Phase	100.13
Ward No. 01	TR_W_01	Tertiary Road	30 ft	Widening	2nd Phase	397.63
Ward No. 01	TR_W_02	Tertiary Road	30 ft	Widening	2nd Phase	189.39
Ward No. 01 Total						**3556.14**

15.3.5 Drainage Development Plan

Among the natural drainage facilities, Gorai River passes through the western-south border of this Ward. The proposed drainage facilities will be developed based on this natural water body. The river will serve as primary outfall and will be connected with secondary drain and tertiary drain. The following table shows the detail.

Table 15.4: Proposed Drainage Development Plan Proposals for Ward No. 01

Ward Name	Proposed Drain ID	Proposed Drain Type	Outfall	Direction	Length (Meter)
Ward 1	PD-01	Primary Drain	Khal	NE-SW	1355.57
	SD-01	Secondary Drain	Khal	E-W	528.55
	TD-01	Tertiary Drain	PD-01	N-S	243.03
Ward 1 Total					**2127.16**

Map 15.2: Proposed Road, Drainage and Utility Services Plan Ward No. 01

15.3.6 Priority Tasks

Land acquisition for proposed development is the main tasks for development of this ward in the first phase of the Master Plan. First by seeking voluntary contribution of land and / or purchase of land through negotiation. In case negotiation fails, the compulsory land acquisition power will be applied to procure land. Attempt will be made to seek contribution of land from adjacent landowners for widening of existing narrow roads. For new roads the landowners will be negotiated to sell their land to the development authority. In case the landowners fail to reach on an agreement the development authority may use its power of compulsory land acquisition to procure necessary land. Again provisions of Electricity, Gas with construction of Road network and Drains are the prime tasks for development of the area. The following priorities has identified after the Public consultation meeting at Khoksa Paurashava.

Table 15.5: Proposed Priority Tasks

Priority-1		Priority-2		Priority-3	
Type	**ID**	**Type**	**ID**	**Type**	**ID**
Development Proposal	-	Development Proposal	NP-1	Development Proposal	TS-1
Road	LR-01	Road	-	Road	-
Drain	PD-01	Drain	SD-01	Drain	-

15.4 Ward Action Plan for Ward 02

15.4.1 Demography

As per the BBS 2011, this Ward had a population of 2453persons. Population projection shows 3145 population for the year 2031. For the same year, it has a density of about 09 persons per acre (ppa) and it will be 12 ppa in 2031. Table 15.6 shows the details.

Table 15.6: Population Statistics of Ward No. 02

Item	Year	
	2011	**2031**
Area (acre)	263.711	263.711
Population	2453	3145
Density of Population (per acre)	9	12

15.4.2 Critical Issues and Opportunities of the Ward

This ward 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 this Ward is 9 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

It has the good external connectivity with surrounding upazila and district town such as Kushtia, Rajbari, Pabna and Jhenaidah.

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.

15.4.3 Proposals and Plans for Ward 02

Ward No. 02 is located at the Middle-North part of Khoksa Paurashava. The area of the Ward is 263.711 acres. After reviewing and commensurating the policies and proposals of Structure Plan and Urban Area Plan the following proposals are made in the Action Plan of **Ward 02** for implementation within next 5 (five) years up to 2016. Land use proposals and proposed road, drainage and utility services plan are shown in **Map 15.3** and **Map 15.4** for this ward.

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 36.52 acres of land has been earmarked for urban residential use, which will occupy 13.85% of the total ward area.

Rural Settlement

As this Ward is rural in character, 18.36 acres of land is proposed to remain as rural settlement which will occupy 6.96% of the total ward area up to the year 2031.

Education and Research Zone

In Ward Action Plan, land for education and research is proposed with an area of 5.43 acres, which is 2.06% of total land of the Ward.

Commercial Zone

In Ward Action Plan, more than 6.83 acres of land has been earmarked for commercial use, which will occupy 2.59% of the total ward area.

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 25.46 acres of land and more than 9.66% of the total area.

Agricultural Zone

The Paurashava including this Ward has a vast area of agricultural land that demands formation of a separate zone like, agriculture zone. Due to development changes of the Ward, 130.59 acres covering 49.52% 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.

Government Office

Total 15.64 acres of Land is earmarked as Government Office for Ward no. 02. It shares 5.93% land of this Ward.

Mixed Use Zone

Total 2.52 acres of Land is earmarked as Mixed Use Zone for Ward no. 02. It shares 0.95% land of this Ward. Ward Centre has propsed for this ward near Rajbari-Kushtia Road and behind the Upazila Complex.

Transportation Facilities

Total 1.01 acres of Land is earmarked as Transportation Facilities for Ward no. 02. It shares 0.38% land of this Ward. A Truck Terminal has proposed in this ward beside Rajbari-Kushtia Road.

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 0.25 acres will be preserved as the water retention ponds. The proposed retention area covers 16.80 acres of land, which covers almost 6.37% of the total Ward area.

The following table shows the detail location and area of New Land Development Proposal (DP).

Table 15.7: New Land Development Proposal (DP)

ID	Name of Proposal	Location	Area (acre)
CM	Cattle Market	West side of the Paurashava	1.196
NM-1	Neighborhood Market	Beside Peteldanga Road	0.933
PT-2	Public Toilet	Near Peteldanga Road	0.092
PT-3	Public Toilet	Beside Rajbari-Kushtia Road	0.164
HS	High School	Near Peteldanga Road	2.893
TT	Truck Terminal	Beside Rajbari-Kushtia Road	0.886
WC-2	Ward Centre	Near Rajbari-Kushtia Road and behind Upazila Complex	1.297
WM	Wholesale Market	Near Rajbari-Kushtia Road	3.997

Map 15.3: Land Use Plan Map for Ward No. 02

15.4.4 Proposed Road Infrastructure Development

Total of 5870.93 meters of road development has been proposed for Ward no. 02. The detailed scenario of road network widening and new road development proposal is given in the following table.

Table 15.8: Widening and New Road Development Proposal for Ward No. 02

Ward No.	Proposed Road ID	Proposed Road Type	Proposed Width (Feet)	Proposed Status	Phase	Length (Meter)
Ward No. 02	LR_N_01	Local Road	20 ft	New Construction	2nd Phase	5.18
Ward No. 02	LR_W_01	Local Road	20 ft	Widening	2nd Phase	254.14
Ward No. 02	PR_N_03	Primary Road	60 ft	New Construction	1st Phase	15.08
Ward No. 02	PR_N_04	Primary Road	60 ft	New Construction	1st Phase	1223.9
Ward No. 02	PR_W_05	Primary Road	100 ft	Widening	1st Phase	974.09
Ward No. 02	PR_W_06	Primary Road	80 ft	Widening	1st Phase	21.14
Ward No. 02	PR_W_07	Primary Road	80 ft	Widening	1st Phase	20.78
Ward No. 02	PR_W_08	Primary Road	80 ft	Widening	1st Phase	18.15
Ward No. 02	PR_W_09	Primary Road	80 ft	Widening	1st Phase	16.46
Ward No. 02	PR_W_10	Primary Road	80 ft	Widening	1st Phase	16.69
Ward No. 02	PR_W_14	Primary Road	80 ft	Widening	1st Phase	240.58
Ward No. 02	SR_N_01	Secondary Road	40 ft	New Construction	1st Phase	673.15
Ward No. 02	SR_N_02	Secondary Road	40 ft	New Construction	1st Phase	194.62
Ward No. 02	SR_W_01	Secondary Road	40 ft	Widening	1st Phase	977.67
Ward No. 02	SR_W_02	Secondary Road	40 ft	Widening	1st Phase	208.33
Ward No. 02	TR_N_01	Tertiary Road	30 ft	New Construction	2nd Phase	90.72
Ward No. 02	TR_N_02	Tertiary Road	30 ft	New Construction	2nd Phase	78.72
Ward No. 02	TR_W_01	Tertiary Road	30 ft	Widening	2nd Phase	105.72
Ward No. 02	TR_W_02	Tertiary Road	30 ft	Widening	2nd Phase	120.01
Ward No. 02	TR_W_03	Tertiary Road	30 ft	Widening	2nd Phase	615.8
Ward No. 02 Total						**5870.93**

15.4.5 Drainage Development Plan

Among the natural drainage facilities, Gorai River passes through the western-south border of this Ward. The proposed drainage facilities will be developed based on this natural water body. The river will serve as primary outfall and will be connected with secondary drain and tertiary drain. The following table shows the detail.

Table 15.9: Proposed Drainage Development Plan Proposals for Ward No. 02

Ward Name	Proposed Drain ID	Proposed Drain Type	Outfall	Direction	Length (Meter)
Ward 2	PD-02	Primary Drain	Khal	SE-NW	1172.38
Ward 2	SD-02	Secondary Drain	Khal	S-N	375.10
Ward 2	SD-03	Secondary Drain	Khal	NE-SW	544.16
Ward 2	SD-04	Secondary Drain	PD-02	N-S	405.98
Ward 2	TD-02	Tertiary Drain	SD-03	S-N	242.81
Ward 2	TD-03	Tertiary Drain	SD-02	E-W	419.29
Ward 2	TD-04	Tertiary Drain	PD-02	N-S	190.91
Ward 2	TD-05	Tertiary Drain	PD-02	NE-SW	283.00
Ward 2 Total					**3633.63**

Map 15.4: Proposed Road, Drainage and Utility Services Plan Ward No. 02

15.4.6 Priority Tasks

Land acquisition for proposed development is the main tasks for development of this ward in the first phase of the Master Plan. First by seeking voluntary contribution of land and / or purchase of land through negotiation. In case negotiation fails, the compulsory land acquisition power will be applied to procure land. Attempt will be made to seek contribution of land from adjacent landowners for widening of existing narrow roads. For new roads the landowners will be negotiated to sell their land to the development authority. In case the landowners fail to reach on an agreement the development authority may use its power of compulsory land acquisition to procure necessary land. Again provisions of Electricity, Gas with construction of Road network and Drains are the prime tasks for development of the area. The following priorities has identified after the Public consultation meeting at Khoksa Paurashava.

Table 15. 10: Proposed Priority Tasks

Priority-1		Priority-2		Priority-3	
Type	**ID**	**Type**	**ID**	**Type**	**ID**
Development Proposal	CM, PT-2	Development Proposal	PT-3	Development Proposal	NM-1
Road	LR-03, LR-07	Road	LR-05	Road	LR-06
Drain	PD-02, SD-02	Drain	SD-03	Drain	SD-04

15.5 Ward Action Plan for Ward 03

15.5.1 Demography

As per the BBS 2011, this Ward had a population of 2016 persons. Population projection shows 2585 population for the year 2031. For the same year, it has a density of about 08 persons per acre (ppa) and it will be 11 ppa in 2031. Table 15.11 shows the details.

Table 15.11: Population Statistics of Ward No. 03

Item	Year	
	2011	2031
Area (acre)	240.199	240.199
Population	2016	2585
Density of Population (per acre)	8	11

15.5.2 Critical Issues and Opportunities of the Ward

This ward 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 this Ward is 8 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

It has the good external connectivity with surrounding upazila and district town such as Kushtia, Rajbari, Pabna and Jhenaidah.

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.

15.5.3 Proposals and Plans for Ward 03

Ward No. 03 is located at the East part of Khoksa Paurashava. The area of the Ward is 240.199 acres. After reviewing and commensurating the policies and proposals of Structure Plan and Urban Area Plan the following proposals are made in the Action Plan of **Ward 03** for implementation within next 5 (five) years up to 2016. Land use proposals and proposed road, drainage and utility services plan are shown in **Map 15.5** and **Map 15.6** for this ward.

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 39.64 acres of land has been earmarked for urban residential use, which will occupy 16.50% of the total ward area.

Rural Settlement

As this Ward is rural in character, 3.75 acres of land is proposed to remain as rural settlement which will occupy 1.56% of the total ward area up to the year 2031.

Education and Research Zone

In Ward Action Plan, land for education and research is proposed with an area of 3.38 acres, which is 1.41% of total land of the 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 24.75 acres of land and more than 10.31% of the total area.

Health Services

Total 6.03 acres of Land is earmarked as Health Services for Ward no. 03. It shares 2.51% land of 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. Due to development changes of the Ward, 144.61 acres covering 60.21% 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.

Transportation Facilities

Total 1.56 acres of Land is earmarked as Health Services for Ward no. 03. It shares 0.65% land of this Ward. Bus Terminal has proposed at the middle of the Paurashava; beside Rajbari-Kushtia Road and a tempu stand has proposed beside Train Station to Janipur Bazar Road in 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 0.25 acres will be preserved as the water retention ponds. The proposed retention area covers 11.38 acres of land, which covers almost 4.74% of the total Ward area.

The following table shows the detail location and area of New Land Development Proposal (DP).

Table 15.12: New Land Development Proposal (DP)

ID	Name of Proposal	Location	Area (acre)
BT	Bus Terminal	At the middle of the Paurashava; beside Rajbari-Kushtia Road	1.123
PT-4	Public Toilet	Near Station to Janipur Bazar Road	0.187
TS-2	Tempu Stand	Beside Train Station to Janipur Bazar Road	0.351
WC-3	Ward Centre	Near Rail Station to Janipur Bazar Road	1.144

Map 15.5: Land Use Plan Map for Ward No. 03

15.5.4 Proposed Road Infrastructure Development

Total of 6669.66 meters of road development has been proposed for Ward no. 03. The detailed scenario of road network widening and new road development proposal is given in the following table.

Table 15.13: Widening and New Road Development Proposal for Ward No. 03

Ward No.	Proposed Road ID	Proposed Road Type	Proposed Width (Feet)	Proposed Status	Phase	Length (Meter)
Ward No. 03	LR_N_01	Local Road	20 ft	New Construction	2nd Phase	1159.83
	LR_W_02	Local Road	20 ft	Widening	2nd Phase	549.02
	LR_W_03	Local Road	20 ft	Widening	2nd Phase	502.93
	PR_N_01	Primary Road	60 ft	New Construction	1st Phase	1232.48
	PR_W_01	Primary Road	100 ft	Widening	1st Phase	23.07
	PR_W_02	Primary Road	100 ft	Widening	1st Phase	25.33
	PR_W_03	Primary Road	100 ft	Widening	1st Phase	28.09
	PR_W_04	Primary Road	100 ft	Widening	1st Phase	4.46
	PR_W_05	Primary Road	100 ft	Widening	1st Phase	1102.46
	PR_W_06	Primary Road	80 ft	Widening	1st Phase	3.04
	PR_W_09	Primary Road	80 ft	Widening	1st Phase	4.11
	PR_W_10	Primary Road	80 ft	Widening	1st Phase	4.3
	PR_W_14	Primary Road	80 ft	Widening	1st Phase	977.76
	SR_N_01	Secondary Road	40 ft	New Construction	1st Phase	8.57
	SR_N_03	Secondary Road	40 ft	New Construction	1st Phase	170.54
	SR_N_07	Secondary Road	40 ft	New Construction	1st Phase	836.96
	SR_W_01	Secondary Road	40 ft	Widening	1st Phase	4.83
	TR_W_07	Tertiary Road	30 ft	Widening	2nd Phase	6.86
	TR_W_09	Tertiary Road	30 ft	Widening	2nd Phase	25.02
Ward No. 03 Total						**6669.66**

15.5.5 Drainage Development Plan

Among the natural drainage facilities, Gorai River passes through the western-south border of this Ward. The proposed drainage facilities will be developed based on this natural water body. The river will serve as primary outfall and will be connected with secondary drain and tertiary drain. The following table shows the detail.

Table 15.14: Proposed Drainage Development Plan Proposals for Ward No. 03

Ward Name	Proposed Drain ID	Proposed Drain Type	Outfall	Direction	Length (Meter)
Ward 3	SD-05	Secondary Drain	Khal	N-S	627.58
	TD-06	Tertiary Drain	Khal	W-E	399.77
Ward 3 Total					**1027.35**

Map 15.6: Proposed Road, Drainage and Utility Services Plan Ward No. 03

15.5.6 Priority Tasks

Land acquisition for proposed development is the main tasks for development of this ward in the first phase of the Master Plan. First by seeking voluntary contribution of land and / or purchase of land through negotiation. In case negotiation fails, the compulsory land acquisition power will be applied to procure land. Attempt will be made to seek contribution of land from adjacent landowners for widening of existing narrow roads. For new roads the landowners will be negotiated to sell their land to the development authority. In case the landowners fail to reach on an agreement the development authority may use its power of compulsory land acquisition to procure necessary land. Again provisions of Electricity, Gas with construction of Road network and Drains are the prime tasks for development of the area. The following priorities has identified after the Public consultation meeting at Khoksa Paurashava.

Table 15.15: Proposed Priority Tasks

Priority-1		Priority-2		Priority-3	
Type	**ID**	**Type**	**ID**	**Type**	**ID**
Development Proposal	PT-4	Development Proposal	TS-2	Development Proposal	BT
Road	LR-09, LR-45	Road	LR-10	Road	-
Drain	SD-05	Drain	-	Drain	-

15.6 Ward Action Plan for Ward 04

15.6.1 Demography

As per the BBS 2011, this Ward had a population of 1653 persons. Population projection shows 2119 population for the year 2031. For the same year, it has a density of about 18 persons per acre (ppa) and it will be 23 ppa in 2031. Table 15.16 shows the details.

Table 15.16: Population Statistics of Ward No. 04

Item	Year	
	2011	2031
Area (acre)	94.154	94.154
Population	1653	2119
Density of Population (per acre)	18	23

15.6.2 Critical Issues and Opportunities of the Ward

This ward 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 this Ward is 18 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

It has the good external connectivity with surrounding upazila and district town such as Kushtia, Rajbari, Pabna and Jhenaidah.

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.

15.6.3 Proposals and Plans for Ward 04

Ward No. 04 is located at the West part of Khoksa Paurashava. The area of the Ward is 94.154 acres. After reviewing and commensurating the policies and proposals of Structure Plan and Urban Area Plan the following proposals are made in the Action Plan of **Ward 04** for implementation within next 5 (five) years up to 2016. Land use proposals and proposed road, drainage and utility services plan are shown in **Map 15.7** and **Map 15.8** for this ward.

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 28.97 acres of land has been earmarked for urban residential use, which will occupy 30.77% of the total ward area.

Education and Research Zone

In Ward Action Plan, land for education and research is proposed with an area of 1.44 acres, which is 1.53% of total land of the Ward.

Commercial Zone

In Ward Action Plan, land for education and research is proposed with an area of 7.89 acres, which is 8.38% of total land of the Ward. ASuper Market has proposed for this ward near Bazar Area and Gorai River.

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 10.67 acres of land and more than 11.33% of the total area.

Community Facilities

Land for community facilities encompasses by graveyard, temple, mosque etc. 1.08 acres which is 1.15% 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. Due to development changes of the Ward, 7.22 acres covering 7.67% 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 5.71 acres of Land is earmarked as open space for Ward no. 04. It shares 6.07% 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 0.25 acres will be preserved as the water retention ponds. The proposed retention area covers 8.53 acres of land, which covers almost 9.06% of the total Ward area.

The following table shows the detail location and area of New Land Development Proposal (DP).

Table 15.17: New Land Development Proposal (DP)

ID	Name of Proposal	Location	Area (acre)
NP-2	Neighborhood Park	Near Matpara Road	2.465
Pg	Playground	Beside Kalibari Road	1.517
PS-1	Primary School	Beside Kalibari Road	1.180
SH	Slaughter House	Near Bazar Area and Gorai River	0.357
SM-1	Super Market	Near Bazar Area and Gorai River	1.040
Hos-1	Hospital (Community)	Beside Matpara Road	0.453
WC-4	Ward Centre	Beside Kalibari Road	0.539

Map 15.7: Land Use Plan Map for Ward No. 04

15.6.4 Proposed Road Infrastructure Development

Total of 4048.92 meters of road development has been proposed for Ward no. 04. The detailed scenario of road network widening and new road development proposal is given in the following table.

Table 15.18: Widening and New Road Development Proposal for Ward No. 04

Ward No.	Proposed Road ID	Proposed Road Type	Proposed Width (Feet)	Proposed Status	Phase	Length (Meter)
Ward No. 04	LR_N_02	Local Road	20 ft	New Construction	2nd Phase	371.22
Ward No. 04	LR_W_04	Local Road	20 ft	Widening	2nd Phase	213.28
Ward No. 04	LR_W_05	Local Road	20 ft	Widening	2nd Phase	285.8
Ward No. 04	LR_W_06	Local Road	20 ft	Widening	2nd Phase	248.27
Ward No. 04	SR_W_02	Secondary Road	40 ft	Widening	1st Phase	465.33
Ward No. 04	TR_N_01	Tertiary Road	30 ft	New Construction	2nd Phase	478.95
Ward No. 04	TR_N_02	Tertiary Road	30 ft	New Construction	2nd Phase	851.77
Ward No. 04	TR_W_04	Tertiary Road	30 ft	Widening	2nd Phase	367.09
Ward No. 04	TR_W_05	Tertiary Road	30 ft	Widening	2nd Phase	388.8
Ward No. 04	TR_W_06	Tertiary Road	30 ft	Widening	2nd Phase	378.41
Ward No. 04 Total						**4048.92**

15.6.5 Drainage Development Plan

Among the natural drainage facilities, Gorai River passes through the western-south border of this Ward. The proposed drainage facilities will be developed based on this natural water body. The river will serve as primary outfall and will be connected with secondary drain and tertiary drain. The following table shows the detail.

Table 15.19: Proposed Drainage Development Plan Proposals for Ward No. 04

Ward Name	Proposed Drain ID	Proposed Drain Type	Outfall	Direction	Length (Meter)
Ward 4	PD-03	Primary Drain	Gorai River	NE-SW	719.04
	SD-06	Secondary Drain	Gorai River	N-S	547.51
	TD-07	Tertiary Drain	SD-06	E-W	393.02
	TD-08	Tertiary Drain	SD-06	E-W	351.22
Ward 4	TD-09	Tertiary Drain	PD-03	NW-SE	225.78
	TD-10	Tertiary Drain	Gorai River	E-W	153.38
Ward 4 Total					**2389.95**

Map 15.8: Proposed Road, Drainage and Utility Services Plan Ward No. 04

15.6.6 Priority Tasks

Land acquisition for proposed development is the main tasks for development of this ward in the first phase of the Master Plan. First by seeking voluntary contribution of land and / or purchase of land through negotiation. In case negotiation fails, the compulsory land acquisition power will be applied to procure land. Attempt will be made to seek contribution of land from adjacent landowners for widening of existing narrow roads. For new roads the landowners will be negotiated to sell their land to the development authority. In case the landowners fail to reach on an agreement the development authority may use its power of compulsory land acquisition to procure necessary land. Again provisions of Electricity, Gas with construction of Road network and Drains are the prime tasks for development of the area. The following priorities has identified after the Public consultation meeting at Khoksa Paurashava.

Table 15.20: Proposed Priority Tasks

Priority-1		Priority-2		Priority-3	
Type	**ID**	**Type**	**ID**	**Type**	**ID**
Development Proposal	Pg, SH	Development Proposal	PS-1, NP-2	Development Proposal	SM-1
Road	LR-11, 12, 14, 15	Road	LR-13, 18	Road	LR-19
Drain	PD-03	Drain	SD-06	Drain	TD-10

15.7 Ward Action Plan for Ward 05

15.7.1 Demography

As per the BBS 2011, this Ward had a population of 1802 persons. Population projection shows 2310 population for the year 2031. For the same year, it has a density of about 27 persons per acre (ppa) and it will be 34 ppa in 2031. Table 15.21 shows the details.

Table 15. 21: Population Statistics of Ward No. 05

Item	Year	
	2011	2031
Area (acre)	67.93	67.93
Population	1802	2310
Density of Population (per acre)	27	34

15.7.2 Critical Issues and Opportunities of the Ward

This ward 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 this Ward is 27 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

It has the good external connectivity with surrounding upazila and district town such as Kushtia, Rajbari, Pabna and Jhenaidah.

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.

15.7.3 Proposals and Plans for Ward 05

Ward No. 05 is located at the West part of Khoksa Paurashava. The area of the Ward is 67.93 acres. After reviewing and commensurating the policies and proposals of Structure Plan and Urban Area Plan the following proposals are made in the Action Plan of Ward 05 for implementation within next 5 (five) years up to 2016. Land use proposals and proposed road, drainage and utility services plan are shown in **Map 15.9** and **Map 15.10** for this ward.

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 21.84 acres of land has been earmarked for urban residential use, which will occupy 32.15% of the total ward area.

Education and Research Zone

In Ward Action Plan, land for education and research is proposed with an area of 4.72 acres, which is 6.95% of total land of the Ward.

Commercial Zone

In Ward Action Plan, more than 4.00 acres of land has been earmarked for commercial use, which will occupy 5.89% of the total ward area.

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 6.55 acres of land and more than 9.64% of the total area.

Community Facilities

Land for community facilities encompasses by graveyard, temple, mosque etc. 0.41 acres (0.60%) of land has been proposed for community facilities in this ward.

Open Space

Total 0.90 acres of Land is earmarked as open space for Ward no. 05. It shares 1.33% land of this Ward.

Mixed Use Zone

Mixed land use refers to the area without a dominant land use (Residential, commercial, industrial etc.). Total area for mixed uses has been put to 14.42 acres (21.22%), including both, existing and proposed land uses for 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 0.25 acres will be preserved as the water retention ponds. The proposed retention area covers 8.09 acres of land, which covers almost 11.91% of the total Ward area.

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 3.32 acres (4.88%) that include existing and proposed land uses for this ward.

The following table shows the detail location and area of New Land Development Proposal (DP).

Table 15.22: New Land Development Proposal (DP)

ID	Name of Proposal	Location	Area (acre)
PT-5	Public Toilet	Near Bazar Area	0.195
VI	Vocational Institute	At the middle of the Pourashava (Ward 5, 6 & 7)	0.818
WC-5	Ward Centre	Beside Thana Road	0.385

Map 15.9: Land Use Plan Map for Ward No. 05

15.7.4 Proposed Road Infrastructure Development

Total of 2714.96 meters of road development has been proposed for Ward no. 05. The detailed scenario of road network widening and new road development proposal is given in the following table.

Table 15.23: Widening and New Road Development Proposal for Ward No. 05

Ward No.	Proposed Road ID	Proposed Road Type	Proposed Width (Feet)	Proposed Status	Phase	Length (Meter)
Ward No. 05	LR_N_03	Local Road	20 ft	New Construction	2nd Phase	298.79
Ward No. 05	LR_N_04	Local Road	20 ft	New Construction	2nd Phase	168.49
Ward No. 05	LR_W_04	Local Road	20 ft	Widening	2nd Phase	154.66
Ward No. 05	LR_W_07	Local Road	20 ft	Widening	2nd Phase	220.14
Ward No. 05	SR_N_03	Secondary Road	40 ft	New Construction	1st Phase	107.47
Ward No. 05	TR_N_02	Tertiary Road	30 ft	New Construction	2nd Phase	560.91
Ward No. 05	TR_W_05	Tertiary Road	30 ft	Widening	2nd Phase	216.21
Ward No. 05	TR_W_07	Tertiary Road	30 ft	Widening	2nd Phase	837.55
Ward No. 05	TR_W_08	Tertiary Road	30 ft	Widening	2nd Phase	150.74
Ward No. 05 Total						**2714.96**

15.7.5 Drainage Development Plan

Among the natural drainage facilities, Gorai River passes through the western-south border of this Ward. The proposed drainage facilities will be developed based on this natural water body. The river will serve as primary outfall and will be connected with secondary drain and tertiary drain. The following table shows the detail.

Table 15. 24: Proposed Drainage Development Plan Proposals for Ward No. 05

Ward Name	Proposed Drain ID	Proposed Drain Type	Outfall	Direction	Length (Meter)
Ward 5	SD-07	Secondary Drain	Gorai River	NE-SW	801.01
	TD-11	Tertiary Drain	PD-03	E-W	169.63
	TD-12	Tertiary Drain	PD-03	E-W	233.15
Ward 5 Total					**1203.80**

Map 15.10: Proposed Road, Drainage and Utility Services Plan Ward No. 05

15.7.6 Priority Tasks

Land acquisition for proposed development is the main tasks for development of this ward in the first phase of the Master Plan. First by seeking voluntary contribution of land and / or purchase of land through negotiation. In case negotiation fails, the compulsory land acquisition power will be applied to procure land. Attempt will be made to seek contribution of land from adjacent landowners for widening of existing narrow roads. For new roads the landowners will be negotiated to sell their land to the development authority. In case the landowners fail to reach on an agreement the development authority may use its power of compulsory land acquisition to procure necessary land. Again provisions of Electricity, Gas with construction of Road network and Drains are the prime tasks for development of the area. The following priorities has identified after the Public consultation meeting at Khoksa Paurashava.

Table 15.25: Proposed Priority Tasks

Priority-1		Priority-2		Priority-3	
Type	**ID**	**Type**	**ID**	**Type**	**ID**
Development Proposal	PT-5	Development Proposal	-	Development Proposal	-
Road	LR-21, 24	Road	LR-22	Road	LR-23
Drain	SD-01	Drain	-	Drain	-

15.8 Ward Action Plan for Ward 06

15.8.1 Demography

As per the BBS 2011, this Ward had a population of 1941 persons. Population projection shows 2488 population for the year 2031. For the same year, it has a density of about 07 persons per acre (ppa) and it will be 9 ppa in 2031. Table 15.26 shows the details.

Table 15.26: Population Statistics of Ward No. 06

Item	Year	
	2011	2031
Area (acre)	285.558	285.558
Population	1941	2488
Density of Population (per acre)	7	9

15.8.2 Critical Issues and Opportunities of the Ward

This ward 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 this 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

It has the good external connectivity with surrounding upazila and district town such as Kushtia, Rajbari, Pabna and Jhenaidah.

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.

15.8.3 Proposals and Plans for Ward 06

Ward No. 06 is located at the East part of Khoksa Paurashava. The area of the Ward is 285.558 acres. After reviewing and commensurating the policies and proposals of Structure Plan and Urban Area Plan the following proposals are made in the Action Plan of Ward 06 for implementation within next 5 (five) years up to 2016. Land use proposals and proposed road, drainage and utility services plan are shown in **Map 15.11** and **Map 15.12** for this ward.

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 36.28 acres of land has been earmarked for urban residential use, which will occupy 12.70% of the total ward area. A Resettlement Zone has proposed in this ward.

Rural Settlement

As this Ward is rural in character, 7.10 acres of land is proposed to remain as rural settlement which will occupy 2.49% of the total ward area up to the year 2031.

Education and Research Zone

In Ward Action Plan, land for education and research is proposed with an area of 1.89 acres, which is 0.66% of total land of the Ward. The location of proposed vocational institute is situated in this ward partial.

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 22.08 acres of land and more than 7.73% of the total area.

Community Facilities

Land for community facilities encompasses by graveyard, temple, mosque etc. 3.02 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. Due to development changes of the Ward, 178.79 acres covering 62.61% 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.

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 16.80 acres (5.88%) that include existing and proposed land uses for 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 0.25 acres will be preserved as the water retention ponds. The proposed retention area covers 8.68 acres of land, which covers almost 3.04% of the total Ward area.

The following table shows the detail location and area of New Land Development Proposal (DP).

Table 15.27: New Land Development Proposal (DP)

ID	Name of Proposal	Location	Area (acre)
PT-6	Public Toilet	Beside Station to Janipur Bazar Road	0.097
TS-3	Tempu Stand	Beside Thana Road	0.356
WDG	Waste Disposal Ground	At the East side of the Paurashava	6.486
WC-6	Ward Centre	At the middle of the Paurashava	0.277
VI	Vocational Institute	At the middle of the Paurashava (Ward 5, 6 & 7)	0.818
RZ	Resettlement Zone	At the middle of the Paurashava (Ward 6 & 7)	6.801

Map 15.11: Land Use Plan Map for Ward No. 06

15.8.4 Proposed Road Infrastructure Development

Total of 6185.84meters of road development has been proposed for Ward no. 06. The detailed scenario of road network widening and new road development proposal is given in the following table.

Table 15.28: Widening and New Road Development Proposal for Ward No. 06

Ward No.	Proposed Road ID	Proposed Road Type	Proposed Width (Feet)	Proposed Status	Phase	Length (Meter)
Ward No. 06	LR_N_05	Local Road	20 ft	New Construction	2nd Phase	330.11
Ward No. 06	LR_N_06	Local Road	20 ft	New Construction	2nd Phase	620.41
Ward No. 06	PR_N_02	Primary Road	60 ft	New Construction	1st Phase	1141.97
Ward No. 06	PR_W_04	Primary Road	100 ft	Widening	1st Phase	20.36
Ward No. 06	PR_W_05	Primary Road	100 ft	Widening	1st Phase	541.49
Ward No. 06	SR_N_03	Secondary Road	40 ft	New Construction	1st Phase	1276.41
Ward No. 06	SR_N_04	Secondary Road	40 ft	New Construction	1st Phase	430.7
Ward No. 06	SR_N_05	Secondary Road	40 ft	New Construction	1st Phase	630.45
Ward No. 06	SR_N_06	Secondary Road	40 ft	New Construction	1st Phase	565.52
Ward No. 06	TR_W_05	Tertiary Road	30 ft	Widening	2nd Phase	384.75
Ward No. 06	TR_W_07	Tertiary Road	30 ft	Widening	2nd Phase	70.36
Ward No. 06	TR_W_08	Tertiary Road	30 ft	Widening	2nd Phase	173.31
Ward No. 06 Total						**6185.84**

15.8.5 Drainage Development Plan

Among the natural drainage facilities, Gorai River passes through the western-south border of this Ward. The proposed drainage facilities will be developed based on this natural water body. The river will serve as primary outfall and will be connected with secondary drain and tertiary drain. The following table shows the detail.

Table 15.29: Proposed Drainage Development Plan Proposals for Ward No. 06

Ward Name	Proposed Drain ID	Proposed Drain Type	Outfall	Direction	Length (Meter)
Ward 6	TD-13	Tertiary Drain	SD-07	E-W	217.61
	TD-14	Tertiary Drain	SD-07	E-W	394.54
Ward 6 Total					**612.15**

Map 15.12: Proposed Road, Drainage and Utility Services Plan Ward No. 06

15.8.6 Priority Tasks

Land acquisition for proposed development is the main tasks for development of this ward in the first phase of the Master Plan. First by seeking voluntary contribution of land and / or purchase of land through negotiation. In case negotiation fails, the compulsory land acquisition power will be applied to procure land. Attempt will be made to seek contribution of land from adjacent landowners for widening of existing narrow roads. For new roads the landowners will be negotiated to sell their land to the development authority. In case the landowners fail to reach on an agreement the development authority may use its power of compulsory land acquisition to procure necessary land. Again provisions of Electricity, Gas with construction of Road network and Drains are the prime tasks for development of the area. The following priorities has identified after the Public consultation meeting at Khoksa Paurashava.

Table 15.30: Proposed Priority Tasks

Priority-1		Priority-2		Priority-3	
Type	**ID**	**Type**	**ID**	**Type**	**ID**
Development Proposal	PT-6	Development Proposal	TS-3	Development Proposal	WDG
Road	LR-27	Road	LR-26	Road	LR-28
Drain	-	Drain	-	Drain	-

15.9 Ward Action Plan for Ward 07

15.9.1 Demography

As per the BBS 2011, this Ward had a population of 1501 persons. Population projection shows 1924 population for the year 2031. For the same year, it has a density of about 18 persons per acre (ppa) and it will be 23 ppa in 2031. Table 15.30 shows the details.

Table 15.31: Population Statistics of Ward No. 07

Item	Year	
	2011	2031
Area (acre)	84.303	84.303
Population	1501	1924
Density of Population (per acre)	18	23

15.9.2 Critical Issues and Opportunities of the Ward

This ward 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 this Ward is 18 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

It has the good external connectivity with surrounding upazila and district town such as Kushtia, Rajbari, Pabna and Jhenaidah.

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.

15.9.3 Proposals and Plans for Ward 07

Ward No. 07 is located at the Middle-West part of Khoksa Paurashava. The area of the Ward is 84.303 acres. After reviewing and commensurating the policies and proposals of Structure Plan and Urban Area Plan the following proposals are made in the Action Plan of Ward 07 for implementation within next 5 (five) years up to 2016. Land use proposals and proposed road, drainage and utility services plan are shown in **Map 15.13** and **Map 15.14** for this ward.

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 42.42 acres of land has been earmarked for urban residential use, which will occupy 50.32% of the total ward area.

Education and Research Zone

In Ward Action Plan, land for education and research is proposed with an area of 1.17 acres, which is 1.38% of total land of the Ward.

Commercial Zone

In Ward Action Plan, more than 0.50 acres of land has been earmarked for commercial use, which will occupy 0.60% of the total ward area.

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 7.94 acres of land and more than 9.42% of the total area.

Open Space

Total 17.14 acres of Land is earmarked as open space for Ward no. 07. It shares 20.33% land of this Ward. Central Park has proposed near Kamalapur Road in this ward. The proposed Stadium is in this ward near Kamalapur Road.

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 7.19 acres (8.53%) that include existing and proposed land uses for 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 0.25 acres will be preserved as the water retention ponds. The proposed retention area covers 3.38 acres of land, which covers almost 4.01% of the total Ward area.

The following table shows the detail location and area of New Land Development Proposal (DP).

Table 15.32: New Land Development Proposal (DP)

ID	Name of Proposal	Location	Area (acre)
PB	Paurashava Building	Near Kamalapur High School	0.628
CP	Central Park	Near Kamalapur Road	9.307
LIH	Low Income Housing	Beside Kamalapur Road	7.433
RZ	Resettlement Zone	At the middle of the Paurashava (Ward 6, 7)	6.801
St	Stadium	Near Kamalapur Road	7.736

Map 1513: Land Use Plan Map for Ward No. 07

15.9.4 Proposed Road Infrastructure Development

Total of 3103.93 meters of road development has been proposed for Ward no. 07. The detailed scenario of road network widening and new road development proposal is given in the following table.

Table 15.33: Widening and New Road Development Proposal for Ward No. 07

Ward No.	Proposed Road ID	Proposed Road Type	Proposed Width (Feet)	Proposed Status	Phase	Length (Meter)
Ward No. 07	LR_N_04	Local Road	20 ft	New Construction	2nd Phase	278.42
Ward No. 07	LR_N_05	Local Road	20 ft	New Construction	2nd Phase	383.27
Ward No. 07	SR_N_04	Secondary Road	40 ft	New Construction	1st Phase	564.93
Ward No. 07	SR_N_05	Secondary Road	40 ft	New Construction	1st Phase	549.27
Ward No. 07	SR_N_06	Secondary Road	40 ft	New Construction	1st Phase	236.54
Ward No. 07	TR_N_02	Tertiary Road	30 ft	New Construction	2nd Phase	96.54
Ward No. 07	TR_W_08	Tertiary Road	30 ft	Widening	2nd Phase	763.16
Ward No. 07	TR_W_10	Tertiary Road	30 ft	Widening	2nd Phase	231.8
Ward No. 07 Total						**3103.93**

15.9.5 Drainage Development Plan

Among the natural drainage facilities, Gorai River passes through the western-south border of this Ward. The proposed drainage facilities will be developed based on this natural water body. The river will serve as primary outfall and will be connected with secondary drain and tertiary drain. The following table shows the detail.

Table 15.34: Proposed Drainage Development Plan Proposals for Ward No. 07

Ward Name	Proposed Drain ID	Proposed Drain Type	Outfall	Direction	Length (Meter)
Ward 7	PD-04	Primary Drain	Gorai River	E-W	918.55
	TD-15	Tertiary Drain	PD-04	N-S	259.88
Ward 7 Total					**1178.44**

Map 15.14: Proposed Road, Drainage and Utility Services Plan Ward No. 07

15.9.6 Priority Tasks

Land acquisition for proposed development is the main tasks for development of this ward in the first phase of the Master Plan. First by seeking voluntary contribution of land and / or purchase of land through negotiation. In case negotiation fails, the compulsory land acquisition power will be applied to procure land. Attempt will be made to seek contribution of land from adjacent landowners for widening of existing narrow roads. For new roads the landowners will be negotiated to sell their land to the development authority. In case the landowners fail to reach on an agreement the development authority may use its power of compulsory land acquisition to procure necessary land. Again provisions of Electricity, Gas with construction of Road network and Drains are the prime tasks for development of the area. The following priorities has identified after the Public consultation meeting at Khoksa Paurashava.

Table 15. 35: Proposed Priority Tasks

Priority-1		Priority-2		Priority-3	
Type	**ID**	**Type**	**ID**	**Type**	**ID**
Development Proposal	PB	Development Proposal	-	Development Proposal	-
Road	LR-31	Road	LR-32	Road	-
Drain	PD-04	Drain	-	Drain	-

15.10 Ward Action Plan for Ward 08

15.10.1 Demography

As per the BBS 2011, this Ward had a population of 2378 persons. Population projection shows 3049 population for the year 2031. For the same year, it has a density of about 27 persons per acre (ppa) and it will be 35 ppa in 2031. Table 15.35 shows the details.

Table 15.36: Population Statistics of Ward No. 08

Item	Year	
	2011	2031
Area (acre)	87.485	87.485
Population	2378	3049
Density of Population (per acre)	27	35

15.10.2 Critical Issues and Opportunities of the Ward

This ward 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 this Ward is 27 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

It has the good external connectivity with surrounding upazila and district town such as Kushtia, Rajbari, Pabna and Jhenaidah.

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.

15.10.3 Proposals and Plans for Ward 08

Ward No. 08 is located at the West part of Khoksa Paurashava. The area of the Ward is 87.485 acres. After reviewing and commensurating the policies and proposals of Structure Plan and Urban Area Plan the following proposals are made in the Action Plan of Ward 08 for implementation within next 5 (five) years up to 2016. Action Plan Map for Ward 08 is shows in Map-23.1.

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 44.64 acres of land has been earmarked for urban residential use, which will occupy 51.03% of the total ward area.

Rural Settlement

As this Ward is rural in character, 4.73 acres of land is proposed to remain as rural settlement which will occupy 5.40% of the total ward area up to the year 2031.

Commercial Zone

In Ward Action Plan, more than 1.21 acres of land has been earmarked for commercial use, which will occupy 1.39% of the total ward area.

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 8.32 acres of land and more than 9.51% of the total area.

Community Facilities

Land for community facilities encompasses by graveyard, temple, mosque etc. 1.01 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. Due to development changes of the Ward, 8.28 acres covering 9.46% 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 1.14 acres of Land is earmarked as open space for Ward no. 08. It shares 1.30% land of this Ward.

Mixed Use Zone

Mixed land use refers to the area without a dominant land use (Residential, commercial, industrial etc.). Total area for mixed uses has been put to 0.59 acres (0.67%), including both, existing and proposed land uses for 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 0.25 acres will be preserved as the water retention ponds. The proposed retention area covers 13.75 acres of land, which covers almost 15.72% of the total Ward area.

The following table shows the detail location and area of New Land Development Proposal (DP).

Table 15.37: New Land Development Proposal (DP)

ID	Name of Proposal	Location	Area (acre)
NM-2	Neighborhood Market	South side of the Paurashava	0.999
PT-7	Public Toilet	South side of the Paurashava	0.085
C	College	At the middle of the Paurashava	4.230
PS-2	Primary School	In front of Shahi Talamul Quran madrasha	0.528
WC-7	Ward Centre	At the South side of the Paurashava	0.315

Map 15.15: Land Use Plan Map for Ward No. 08

15.10.4 Proposed Road Infrastructure Development

Total of 2999.25 meters of road development has been proposed for Ward no. 08. The detailed scenario of road network widening and new road development proposal is given in the following table.

Table 15.38: Widening and New Road Development Proposal for Ward No. 08

Ward No.	Proposed Road ID	Proposed Road Type	Proposed Width (Feet)	Proposed Status	Phase	Length (Meter)
Ward No. 08	LR_N_07	Local Road	20 ft	New Construction	2nd Phase	395.3
Ward No. 08	LR_W_08	Local Road	20 ft	Widening	2nd Phase	333.67
Ward No. 08	SR_N_04	Secondary Road	40 ft	New Construction	1st Phase	644.02
Ward No. 08	SR_N_05	Secondary Road	40 ft	New Construction	1st Phase	112.36
Ward No. 08	SR_N_06	Secondary Road	40 ft	New Construction	1st Phase	244.62
Ward No. 08	SR_W_03	Secondary Road	40 ft	Widening	1st Phase	90.59
Ward No. 08	TR_N_02	Tertiary Road	30 ft	New Construction	2nd Phase	590.86
Ward No. 08	TR_W_10	Tertiary Road	30 ft	Widening	2nd Phase	587.83
Ward No. 08 Total						**2999.25**

15.10.5 Drainage Development Plan

Among the natural drainage facilities, Gorai River passes through the western-south border of this Ward. The proposed drainage facilities will be developed based on this natural water body. The river will serve as primary outfall and will be connected with secondary drain and tertiary drain. The following table shows the detail.

Table 15.39: Proposed Drainage Development Plan Proposals for Ward No. 08

Ward Name	Proposed Drain ID	Proposed Drain Type	Outfall	Direction	Length (Meter)
Ward 8	SD-08	Secondary Drain	Gorai River	E-W	495.87
	TD-16	Tertiary Drain	Gorai River	E-W	336.27
	TD-17	Tertiary Drain	SD-09	N-S	364.39
Ward 8 Total					**1196.53**

Map 15.16: Proposed Road, Drainage and Utility Services Plan Ward No. 08

15.10.6 Priority Tasks

Land acquisition for proposed development is the main tasks for development of this ward in the first phase of the Master Plan. First by seeking voluntary contribution of land and / or purchase of land through negotiation. In case negotiation fails, the compulsory land acquisition power will be applied to procure land. Attempt will be made to seek contribution of land from adjacent landowners for widening of existing narrow roads. For new roads the landowners will be negotiated to sell their land to the development authority. In case the landowners fail to reach on an agreement the development authority may use its power of compulsory land acquisition to procure necessary land. Again provisions of Electricity, Gas with construction of Road network and Drains are the prime tasks for development of the area. The following priorities has identified after the Public consultation meeting at Khoksa Paurashava.

Table 15.40: Proposed Priority Tasks

Priority-1		Priority-2		Priority-3	
Type	**ID**	**Type**	**ID**	**Type**	**ID**
Development Proposal	PT-7	Development Proposal	NM-2	Development Proposal	-
Road	LR-34	Road	LR-36	Road	-
Drain	SD-08	Drain	TD-16	Drain	-

15.11 Ward Action Plan for Ward 09

15.11.1 Demography

As per the BBS 2011, this Ward had a population of 1888 persons. Population projection shows 2420 population for the year 2031. For the same year, it has a density of about 12 persons per acre (ppa) and it will be 15 ppa in 2031. Table 15.40 shows the details.

Table 15.41: Population Statistics of Ward No. 09

Item	Year	
	2011	2031
Area (acre)	160.465	160.465
Population	1888	2420
Density of Population (per acre)	12	15

15.11.2 Critical Issues and Opportunities of the Ward

This ward 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 this Ward is 12 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

It has the good external connectivity with surrounding upazila and district town such as Kushtia, Rajbari, Pabna and Jhenaidah.

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.

15.11.3 Proposals and Plans for Ward 09

Ward No. 09 is located at the South part of Khoksa Paurashava. The area of the Ward is 160.465 acres. After reviewing and commensurating the policies and proposals of Structure Plan and Urban Area Plan the following proposals are made in the Action Plan of Ward 09 for implementation within next 5 (five) years up to 2016. Land use proposals and proposed road, drainage and utility services plan are shown in **Map 15.17** and **Map 15.18** for this ward.

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 35.86 acres of land has been earmarked for urban residential use, which will occupy 0.01% of the total ward area.

Rural Settlement

As this Ward is rural in character, 9.06 acres of land is proposed to remain as rural settlement which will occupy 5.65% of the total ward area up to the year 2031.

Education and Research Zone

In Ward Action Plan, land for education and research is proposed with an area of 0.58 acres, which is 0.36% of total land of the Ward.

Commercial Zone

In Ward Action Plan, more than 0.21 acres of land has been earmarked for commercial use, which will occupy 0.13% of the total ward area.

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 12.75 acres of land and more than 7.95% of the total area.

Health Services

In Ward Action Plan, more than 0.47 acres of land has been earmarked for commercial use, which will occupy 0.29% of the total ward area. A hospital (community) has proposed in this ward at the south side of the Paurashava.

Community Facilities

Land for community facilities encompasses by graveyard, temple, mosque etc. 0.53 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. Due to development changes of the Ward, 87.76 acres covering 54.71% 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 1.17 acres of Land is earmarked as open space for Ward no. 09. It shares 0.73% land of this Ward.

Mixed Use Zone

Mixed land use refers to the area without a dominant land use (Residential, commercial, industrial etc.). Total area for mixed uses has been put to 0.77 acres (0.48%), including both, existing and proposed land uses for 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 0.25 acres will be preserved as the water retention ponds. The proposed retention area covers 11.00 acres of land, which covers almost 6.86% of the total Ward area.

The following table shows the detail location and area of New Land Development Proposal (DP).

Table 15.42: New Land Development Proposal (DP)

ID	Name of Proposal	Location	Area (acre)
Hos-2	Hospital (Community)	At the South side of the Paurashava	0.470
WC-8	Ward Centre	At the South side of the Paurashava	0.727

Map 15.17: Land Use Plan Map for Ward No. 09

15.11.4 Proposed Road Infrastructure Development

Total of 4803.15 meters of road development has been proposed for Ward no. 09. The detailed scenario of road network widening and new road development proposal is given in the following table.

Table 15.43: Widening and New Road Development Proposal for Ward No. 09

Ward No.	Proposed Road ID	Proposed Road Type	Proposed Width (Feet)	Proposed Status	Phase	Length (Meter)
Ward No. 09	LR_N_07	Local Road	20 ft	New Construction	2nd Phase	456.68
Ward No. 09	LR_W_09	Local Road	20 ft	Widening	2nd Phase	839.37
Ward No. 09	PR_N_02	Primary Road	60 ft	New Construction	1st Phase	546.4
Ward No. 09	SR_N_04	Secondary Road	40 ft	New Construction	1st Phase	365.42
Ward No. 09	SR_W_03	Secondary Road	40 ft	Widening	1st Phase	324.8
Ward No. 09	SR_W_04	Secondary Road	40 ft	Widening	1st Phase	860.17
Ward No. 09	TR_N_02	Tertiary Road	30 ft	New Construction	2nd Phase	1067.82
Ward No. 09	TR_W_10	Tertiary Road	30 ft	Widening	2nd Phase	342.49
Ward No. 09 Total						**4803.15**

15.11.5 Drainage Development Plan

Among the natural drainage facilities, Gorai River passes through the western-south border of this Ward. The proposed drainage facilities will be developed based on this natural water body. The river will serve as primary outfall and will be connected with secondary drain and tertiary drain. The following table shows the detail.

Table 15.44: Proposed Drainage Development Plan Proposals for Ward No. 09

Ward Name	Proposed Drain ID	Proposed Drain Type	Outfall	Direction	Length (Meter)
Ward 9	SD-09	Secondary Drain	Gorai River	E-W	509.41
Ward 9 Total					**509.41**

Map 15.18: Proposed Road, Drainage and Utility Services Plan Ward No. 09

15.11.6 Priority Tasks

Land acquisition for proposed development is the main tasks for development of this ward in the first phase of the Master Plan. First by seeking voluntary contribution of land and / or purchase of land through negotiation. In case negotiation fails, the compulsory land acquisition power will be applied to procure land. Attempt will be made to seek contribution of land from adjacent landowners for widening of existing narrow roads. For new roads the landowners will be negotiated to sell their land to the development authority. In case the landowners fail to reach on an agreement the development authority may use its power of compulsory land acquisition to procure necessary land. Again provisions of Electricity, Gas with construction of Road network and Drains are the prime tasks for development of the area. The following priorities has identified after the Public consultation meeting at Khoksa Paurashava.

Table 15.45: Proposed Priority Tasks

Priority-1		Priority-2		Priority-3	
Type	**ID**	**Type**	**ID**	**Type**	**ID**
Development Proposal	Hos-2	Development Proposal	-	Development Proposal	-
Road	LR-38	Road	-	Road	-
Drain	SD-09	Drain	-	Drain	-

15.12 Ward Action Plan for Extension Area

15.12.1 Demography

As per the BBS 2011, this Extension Area had a population of 712 persons. This area includes three different portion of the project area. Population projection shows 913 populations for the year 2031. For the same year, it has a density of about 06 persons per acre (ppa) and it will be 07 ppa in 2031. Table 15.45 shows the details.

Table 15.46: Population Statistics for the Extension Area

Item	Year	
	2011	2031
Area (acre)	124.657	124.657
Population	712	913
Density of Population (per acre)	6	7

15.12.2 Critical Issues and Opportunities of the Ward

This extension area 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 extension areas is 6 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

It has the good external connectivity with surrounding upazila and district town such as Kushtia, Rajbari, Pabna and Jhenaidah.

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.

15.12.3 Proposals and Plans for Extension Area

Three Extension Areas are proposed at the North, North-West and South part of Khoksa Paurashava. The area of the Extension is 124.657 acres. After reviewing and commensurating the policies and proposals of Structure Plan and Urban Area Plan the following proposals are made in the Action Plan of Extension Area for implementation within next 5 (five) years up to 2016. Land use proposals and proposed road, drainage and utility services plan are shown in **Map 15.19** and **Map 15.20** for this extension area.

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 0.36 acres of land has been earmarked for urban residential use, which will occupy 0.29% of the total area.

Rural Settlement

As this area is rural in character, 7.87 acres of land is proposed to remain as rural settlement which will occupy 6.34% of the total ward area up to the year 2031.

Education and Research Zone

In Action Plan, land for education and research is proposed with an area of 0.91 acres, which is 0.73% of total land of this area.

Commercial Zone

More than 6.46 acres of land has been earmarked for commercial use, which will occupy 5.21% of the total extention area.

Circulation network

For any type of development, circulation network is an important facility. To improve the efficiency of transport network of the extension area, more roads are proposed which will consume 13.71 acres of land and more than 11.06% of the total area.

Health Services

In Ward Action Plan, more than 1.08 acres of land has been earmarked for Health Services, which will occupy 0.87% of the total extention area.

Community Facilities

Land for community facilities encompasses by graveyard, temple, mosque etc. 0.11 acres of land has been proposed for community facilities in this extention area.

Agricultural Zone

The Paurashava including this Ward has a vast area of agricultural land that demands formation of a separate zone like, agriculture zone. Due to development changes of the Ward, 81.89 acres covering 66.03% 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 2.11 acres of Land is earmarked as open space for the extension areas. It shares 1.70% land of this Ward.

General Industrial Zone

Total 0.14 acres of Land is earmarked as General Industrial Zone for this area. It shares 0.11% of land of this area.

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 0.25 acres will be preserved as the water retention ponds. The proposed retention area covers 7.57 acres of land, which covers almost 6.10% of the total Ward area.

The following table shows the detail location and area of New Land Development Proposal (DP).

Table 15.47: New Land Development Proposal (DP)

ID	Name of Proposal	Location	Area (acre)
NM-3	Neighborhood Market	Near Rail Station	0.750
PT-1	Public Toilet	Near Rail Station	0.098
Hos-3	Hospital (Community)	At the north side of the Paurashava	1.081
NM-3	Neighborhood Market	Near Rail Station	0.750
NP-3	Neighborhood Park	At the North side of the Paurashava	1.985

Map 15.19: Land Use Plan Map for Extension Area 01

Map 15. 20: Land Use Plan Map for Extension Area 02

Map 15. 21: Land Use Plan Map for Extension Area 03

15.12.4 Proposed Road Infrastructure Development

Total of 2624.85 meters of road development has been proposed for extension area-01; 724.39 meters of road development has been proposed for extension area-02 and 765.38 meters of road development has been proposed for extension area-03. The detailed scenario of road network widening and new road development proposal is given in the following table.

Table 15.48: Widening and New Road Development Proposal for Extension Areas

Ward No.	Proposed Road ID	Proposed Road Type	Proposed Width (Feet)	Proposed Status	Phase	Length (Meter)
Extension Area 1	LR_N_08	Local Road	20 ft	New Construction	3rd Phase	251.49
Extension Area 1	LR_N_09	Local Road	20 ft	New Construction	3rd Phase	89.61
Extension Area 1	LR_W_10	Local Road	20 ft	Widening	3rd Phase	505.64
Extension Area 1	LR_W_11	Local Road	20 ft	Widening	3rd Phase	545.98
Extension Area 1	LR_W_12	Local Road	20 ft	Widening	3rd Phase	262.26
Extension Area 1	PR_W_14	Primary Road	80 ft	Widening	1st Phase	69.96
Extension Area 1	SR_W_05	Secondary Road	40 ft	Widening	3rd Phase	899.91
Extension Area 1 Total						**2624.85**
Extension Area 2	PR_W_05	Primary Road	100 ft	Widening	1st Phase	236.12
Extension Area 2	SR_N_02	Secondary Road	40 ft	New Construction	3rd Phase	44.22
Extension Area 2	SR_W_02	Secondary Road	40 ft	Widening	3rd Phase	444.05
Extension Area 2 Total						**724.39**
Extension Area 3	LR_W_09	Local Road	20 ft	Widening	3rd Phase	23.07
Extension Area 3	SR_N_04	Secondary Road	40 ft	New Construction	3rd Phase	169
Extension Area 3	TR_N_02	Tertiary Road	30 ft	New Construction	3rd Phase	573.31
Extension Area 3 Total						**765.38**

Map 15.22: Proposed Road, Drainage and Utility Services Plan for Extension Area 01

Map 15.23: Proposed Road, Drainage and Utility Services Plan for Extension Area 02

Map 15.24: Proposed Road, Drainage and Utility Services Plan for Extension Area 03

15.12.5 Priority Tasks

Land acquisition for proposed development is the main tasks for development of this ward in the first phase of the Master Plan. First by seeking voluntary contribution of land and / or purchase of land through negotiation. In case negotiation fails, the compulsory land acquisition power will be applied to procure land. Attempt will be made to seek contribution of land from adjacent landowners for widening of existing narrow roads. For new roads the landowners will be negotiated to sell their land to the development authority. In case the landowners fail to reach on an agreement the development authority may use its power of compulsory land acquisition to procure necessary land. Again provisions of Electricity, Gas with construction of Road network and Drains are the prime tasks for development of the area. The following priorities has identified after the Public consultation meeting at Khoksa Paurashava.

Table 15.49: Proposed Priority Tasks

Priority-1		Priority-2		Priority-3	
Type	**ID**	**Type**	**ID**	**Type**	**ID**
Development Proposal	NM-3, PT-1	Development Proposal	-	Development Proposal	-
Road	LR-39	Road	-	Road	-
Drain	-	Drain	-	Drain	-

15.13 Implementation Guideline

15.13.1 Implementation Strategy

Project implementation is entirely a Governmental process. Without Land Acquisition no one project can be implemented. In Bangladesh there is no instance that the Government involved people in the implementation process. But during formulation of project and during planning stage the stake holder's participation was ensured. So, there was public participation in preparatory stage. The meeting Minutes and attendance list of Public Consultation Meeting is attached in Appendix-D.

15.13.2 Land Management

Land Management Techniques:

It is very difficult to secure land for widening of existing roads and new roads and also to provide space provision for other utilities and urban amenities.

The development control of entire Paurashava jurisdiction by means of Master Plan indication is the main Land Management Technique.

Prior to the acquisition, the land to be reserve by means of physical marking (pegging out) and to be kept continuous supervision to avoid any unauthorized construction until the final acquisition has completed.

Area Specific Appropriate Land Management Techniques:

Under this strategy, the Khoksa Paurashava Authority will initiate and coordinate a range of measures aimed at stimulating reorganization and re-subdivision of urban area. Besides, Land Management Technique throughout the Master Plan jurisdiction will not be alike.

15.13.3 Areas for Action Area Plan

Areas for action area plan generally applicable for built up part of an urban area. In the project area at present there are total 09 Wards, the built up part of which might be suitable for to identify any action area for creating any infrastructural, social, recreational, educational or commercial facilities.

The action area can be identified within the Ward Action Plans as per the requirement of Government/ semi govt./ autonomous bodies.

15.13.4 Development Control

Development Control is the most important function of Khoksa Paurashava. Master Plan will have no bearing unless development can be channelized to its desired direction through effective control.

15.13.5 Land Use Permit Options

There can be three possible options for a plot seeking land use permit, namely, land use permitted, land use conditionally permitted or land use restricted.

a. Land use Permitted

Land uses that unconditionally permitted in the zone are 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.

b. Land use Permitted with Condition

Land use that generally 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, a neighborhood can at best support two primary schools. Now if a request is made seeking land use permit for a composite textile mill with a dying unit that releases noxious effluent to the surrounding the remaining part being compatible to the land use zone, then the permit may be issued with a condition to exclude the noxious portion. If the condition is fulfilled then the permit is issued against the plot. A list of such conditional uses is maintained in this category.

C. 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 hail in a neighborhood may be cited as an example under this category.

A detailed list of permitted Land use categories have been enclosed in the **Appendix-C**.

15.13.6 Land Use Permit Procedure

Land use permit procedure is a product of a number of interlinking activities. The whole process has been described below:

The procedure is commenced with the submission of formal application by the applicant to the Mayor of the 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 Town Planner, will then check the compliance of land use zone and the permitted use with the proposed land use of the applicant. If the proposed land use does not comply with the land use zone and the permitted use, the proposed land use will be rejected with reasons. If the applicant is not satisfied with this decision he/she can appeal to the the Mayor and the decision taken by the Mayor shall be followed accordingly by the Town Planner.

If the proposed land use is permitted use then it will be permitted without raising further question. But in case of new land use or use conditionally permitted, the Town Planner can either reject the proposed land use showing adequate and reasonable causes or permit proposed land use under some specific conditions.

Chapter16

Concluding Remarks

In order to make the plans sustainable through people's participation, it is now emphasized involvement of the local stakeholders in the planning development process. Such participation creates a sense of ownership of the plan among the stakeholders that brings support for the plan and helps to create favorable conditions to implement the plan provisions. Keeping this approach in mind the present Structure Plan, Urban Area Plan and Ward Action Plans for Khoksa Paurashava has been prepared. It will shape and guide the growth of city in order to meet its social, cultural, environmental, economical, and recreational and many other needs of city dwellers.

The Khoksa Paurashava will be not only the custodian of the plan, it will also be responsible for implementing much of the development projects. Besides, it will also be responsible for monitoring implementation of the development projects by other urban development and service giving agencies. This situation calls for strengthening the existing capacity of Paurashava to handle future volume of work.

The current plan opens up a new horizon of development opportunities and land use control through policy guide lines in broad sense and detailed development proposals unto a very micro level. The land use areas have been marked indicating the mouza and dag numbers. It is expected that control of land use development contrary to the Plan can now be prevented more easily. This will require exercise of power with more vigor and sincerity.

It is not possible for the government alone to go for plot to plot development as per plan with its meager resources. This calls for involving stakeholders, particularly, the land owners in the development process. Such initiative is possible at the local level infrastructure development, where the land owners will be directly benefited. In case of wider level development the development authority can take initiatives for infrastructure cost realization from land owners though evolving innovative mechanism.

Rule of law must be established. A culture of law obedience must be created among the people in general and such practice should start with government agencies first, who often are found not following the regulations of building plan approval. It is hardly possible for the government to control all irregularities unless the people themselves become conscious and cooperative. If necessary stringent measures should be taken against the violators to make people abide by laws.

Regular monitoring of the plan implementation is necessary together with monitoring of urban development trend in new areas. Monitoring would help early detection of problems and suggesting solutions for their amelioration. An early measure in tackling problems can not only save huge public money, but also the miseries of the city dwellers. It is expected that the proper implementation of this plan with close monitoring will make this prosperous city livable, healthy and will bring overall socio-economic development in future.