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Ministry of Local Government, Rural Development & Cooperatives

Local Government Division

KUMARKHALI 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

Local Government Engineering Department (LGED)
Preparation of Master Plan for 223 Paurashava Towns under Upazila Towns Infrastructure Development Project (UTIDP)

KUMARKHALI PAURASHAVA MASTER PLAN: 2011-2031

STRUCTURE PLAN

URBAN AREA PLAN:

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

WARD ACTION PLAN

March, 2014

KUMARKHALI PAURASHAVA
KUMARKHALI, KUSHTIA

KUMARKHALI 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, KumarkhaliPaurashava 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 Kumarkhali Paurashava.

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

(Samsuzzaman Arun)
Mayor
Kumarkhali Paurashava

EXECUTIVE SUMMARY

The term "Master Plan" is a guideline for future development. This guideline is being resulted on specific issues. The Government of Bangladesh has committed to prepare the Paurashava master Plan for ensuring the Paurashava environment livable. At present, development scenery of the Paurashava shows a very grave situation. Primary and secondary drains and natural streams are not functioning as an integrated drainage system due partly to silting up and unplanned and deficient construction and lack of maintenance. Encroachment on drainage reservations causes inundation to many areas, including houses and roads, during heavy storms. There is hardly any roadside drain and if any, the roadside drains are inadequate due to insufficient capacities and incorrect gradients.

Equally, traffic and transportation problems in the Paurashavas in Bangladesh are continuously increasing as the development and management of road network has not been commensurate with the increasing demand for its usage. Traffic congestion, delay, accidents, pedestrian and parking difficulties, air and noise pollution are among the problems. Traffic congestion is one of the most important and critical problems now being identified in the Paurashavas. The situation has been steadily deteriorating over time, over large areas and for longer periods of the day. If this unplanned construction goes on unabated it will make the environment of the Paurashava unsuitable and inhabitable. At present, there is no proper Master Plan for development of Paurashava to overcome those problems. In the absence of proper Master Plan construction of all types of infrastructure like houses, roads, drains, markets are going on unabated in an unplanned manner. This situation is creating an adverse milieu in the original landscape thereby creating environmental hazards.

It appears that planned development of Paurashava is very important. In view of this grave situation it has, therefore, been contemplated that preparation of Master Plan is being made with projection for a period of 20 years. Further, in support of the Master Plan there are separate plans named Structure Plan, Urban area Plan (Consisting of Landuse Plan, Drainage and Environmental Plan, Traffic Management Plan, Urban Services Plan)and Ward Action Plan to ensure operation and maintenance of the existing infrastructure along with those facilities proposed to be built up under the future investment program and above all, to suggest improvement of the management ability of the Paurashava Authority so that their revenue earning capability will be enhanced with a view to building up the Paurashava Authority as self-sustaining local government institution. The Master Plan will also suggest construction of roads and bridges, drainage facilities, markets, bus stands, solid waste management, sanitation, water supply and other such infrastructure facilities.

This is the primary effort of planned development for the Kumarkhali Paurashava, guided by the LGED under Package–12 of the Upazila Towns Infrastructure Development Project (UTIDP). It is expected that the implementation of the plan will induce higher level of

development, ensure planned life, good community and better future of the Paurashava inhabitants.

The project area is located in Kumarkhali Upazila about 30 km East from District Headquarter, Kushtia. The project area is one of the important centers of economic activities within the middle part.It has long cultural and trading relation with, Jhenaidah, Rajbari and Dhaka. Shilaidaha Kuthibari, the famous residence of Rabindranath Tagore, is located within Kumarkhali Upazilla which is very close to Kumarkhali Pourashava. It the Paurashava came into existence in 1869 which indicaes that it is one of the oldest Paurashava in Bangladesh. Itis a 'A' category Paurashava and it lies on 23º 51' north latitude and 89º 15' east longitude in Kushtia District, has an area of 5.27 sq. km(1309.01 acre), divided into 9 wards with a population of 21914. Kumarkhali Paurashava consists of 9 Mouzas with 34 Mouza sheets. The outer boundary of Kumarkhali Upazila is Pabna Sadar Upazila on the north, Shailkupa Upazila on the south, Khoksa & Pangsa on the east and Kushtia Sadar Upazila on the west.

The average elevation of the land of the Paurashava area is 12.4 mPWD. Kumarkhali has evenly elevated land all over the Paurashava but Ward Nos. 1, 7, 8 & 9 have considerably lower elevation of land. Most of the area of the Paurashava of Kushtia lies under normal flood level.

In Kumarkhali Paurashava at present land uses for transport purpose is only 0.05% of total lands of the Paurashava and is continuously increasing according to the demand of the local people. Maximum road width is not at satisfactory level in the Paurashava, as a result traffic congestion is common and frequent in the Paurashava specifically near the Bazaar area. All the local access roads of Kumarkhali Paurashava are found narrow in width and these roads do not possess any pedestrian walkways which are the major causes of problems for the project area in transport sector. Haphazard on street parking has been identified as one of the reasons for traffic congestions in the town.

Kumarkhali could not flourish due to lack of well articulated transportation network both within the Paurashava and its surrounding. Hence, there is a need for developing inter and intra regional connectivity for expanding market of Kumarkhali Bazaar. The Paurashava is self sufficient neither in preparation of plan nor in implementation of plan proposals; is dependence on central government for technical and financial assistance. This dependence might hinder the overall plan making and implementation process. Besides, plan implementation would require the Paurashava to have a good coordination among various stakeholders and with the line ministry (LGRD&C) in place. Therefore, a right kind of Institutional arrangement, and implementation framework would be required for successful implementation of the plan proposals and its future updating. However, the current project regarding Preparation of Master Plan for Kumarkhali Paurashava under UTIDP" emphasizes on having proper guidelines and planning standards by the Paurashava for ensuring sustainable and planned development of the Paurashava.

The Upazila Towns Infrastructure Development Project (UTIDP) of LGED requires that one of its outputs is a comprehensive set of plans for Kumarkhali Paurashava. The proposed set of plans consists of Structure Plan, Urban Area Plan and Ward Action Plan.

The Structure Plan sets out a long-term strategy – covering the twenty years from 2011 to 2031 for urban development and the use of land in the Paurashava Town as a whole. It extends to the entire area demarcated by the Consultant. The document sets out a series of policies to be pursued, if the broad objectives set for development of the Paurashava to be achieved.

The Urban Area Plan elaborates policies of the Structure Plan as far as they affect the area where urban development activity will be concentrated. The plan, therefore, is limited to the existing urban area and its immediate surroundings. It is for a period of ten years, covering the period from 2011 to 2021. In providing more detailed guidance available in the Structure Plan, it gives greater precision to the spatial dimension of the Structure Plan policies. The Urban Area Plan includes landuse Plan, Traffic and Transportation Plan, Drainage and Environmental Management Plan and Plan for Urban Services.

The Ward Action Plan provides guidance for areas where major change or action is expected in the short-term (5 years). According to the individual Ward of the Paurashava, this plan provide further the policies and proposals of both the Structure Plan and Urban Area Plan in more detailed and guidance for the control, promotion and coordination of development.

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List of Abbreviations and Acronyms

BBS	:	Bangladesh Bureau of Statistics
BDT	:	Bangladeshi Taka (Currency)
BM	:	Bench Mark
BTCL	:	Bangladesh Telecommunication Company Limited
BWDB	:	Bangladesh Water Development Board
CBO	:	Community Based organization
CS	:	Cadastral Survey
DGPS	:	Differential Global Positioning System
EMP	:	Environmental Management Plan
EPA	:	Environment Protection Authority
GCP	:	Ground Control Points
GIS	:	Geographic information System
Govt.	:	Government
GPS	:	Global Positioning System
H.Q.	:	Head Quarter
H/hold	:	Household
JICA	:	Japan International Cooperative Agency
KM/ km	:	Kilometer
LAN	:	Local Area Network
LCC	:	Lambert Conformal Conic
LGED	:	Local Government Engineering Department
LPG	:	Liquid Petroleum Gas
MV	:	Motorized Vehicle
NGO	:	Non-Government Organizations
NMV	:	Non Motorized Vehicle
O-D	:	Origin – Destination
Orgs.	:	Organizations
PCU	:	Passenger Car Unit
PD	:	Project Director
PMO	:	Project Management Office
R.F.	:	Representative Fraction
RHD	:	Roads and Highways Department
RoW	:	Right of Way
RS	:	Revenue Survey
RTK-GPS	:	Real Time Kinematics Global Positioning System
SoB	:	Survey of Bangladesh
SPSS	:	Statistical Package for Social Science
TCP	:	Temporary Control Point
TIN	:	Triangulated Irregular Network
ToR	:	Terms of Reference

CHAPTER-1

INTRODUCTION

1.1 Introduction

At present the rate of urbanization in Bangladesh is very high. Between1961 to 1981, the average urban growth rate was 8%. The present average growth rate is about 4.5%. According to the population census of 2001, the share of urban population was about 23.29% and at present it is approximately25%. The importance of urban development is emphasized in terms of its role in the national economy. More than 60% of the national GDP is derived from the non-agricultural sectors that are mainly based in urban areas. Again, the most foreign exchange earning sectors, like, garment and knitwear enterprises are agglomerated in urban areas. These sectors earn over 70% of the foreign exchange.Remittance is also a major sector of foreign exchange earning and a large share of the remittance goes into the purchase of urban land. Surplus remittance is invested in business and manufacturing located in urban areas. These phenomena indicate the increasing role of urban areas being played in the national economy. The expansion of urban economy leads to the growth of urban population and concomitant haphazard urban spatial growth without planning. The rapid urbanization is marked by the creation of Paurashavas, whose number at present stands at 319. Paurashavas are created not only to provide urban services to their citizens, but also to create a livable environment through development of planned and environmentally sound living space.

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

Under the above circumstances, it is high time to think about solving the problems of the Paurashavas that might otherwise be emerged critically in the future. To overcome all likely problems to come in future, the Paurashavas should go for planned development through preparation and implementation of a Master Plan. The Master Plan can be prepared exercising the power conferred to them by the “Local Government (Paurashava) Act 2009”. The Upazila Town Infrastructure Development Project(UTIDP)

aims to prepare Master Plan for 223 Upazila level Paurashavas and Kuakata Tourism center for a period of next 20 years. The project has provisions for separate plans forland use control, drainage and environment, traffic and transportation management and improvement. The project also aims to prepare a Ward Action Plan (WAP) to ensure systematic execution of future infrastructure development projects. There is also aim to prepare proposals to enhance Paurashava revenue so that it becomes more capable to meet its own capital needs. Kumarkhaliis one of Paurashavas within Khulna Region under Package 12.

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

1.2 Philosophy of the Preparation of Master Plan

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

1.3 Objectives of the Master Plan

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

- Find out development issues and potentials of the Kumarkhali Paurashava and make a 20-year development vision for the Paurashava and prepare a Master Plan in line with thevision for the development;
- Plan for the people of Kumarkhali Paurashava to develop and update provisions for better transport and communication network, housing, roads, markets, bus terminals, sanitation, water supply, drainage, solid waste management, electricity, education, leisure and such other infrastructure facilities for meeting the social and community needs of the poor and the disadvantaged groups for better quality of life;
- 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 requirementin accordance with the principle of sustainability;
- Provide controls for private sector development, with clarity and security in regard to
- future development;

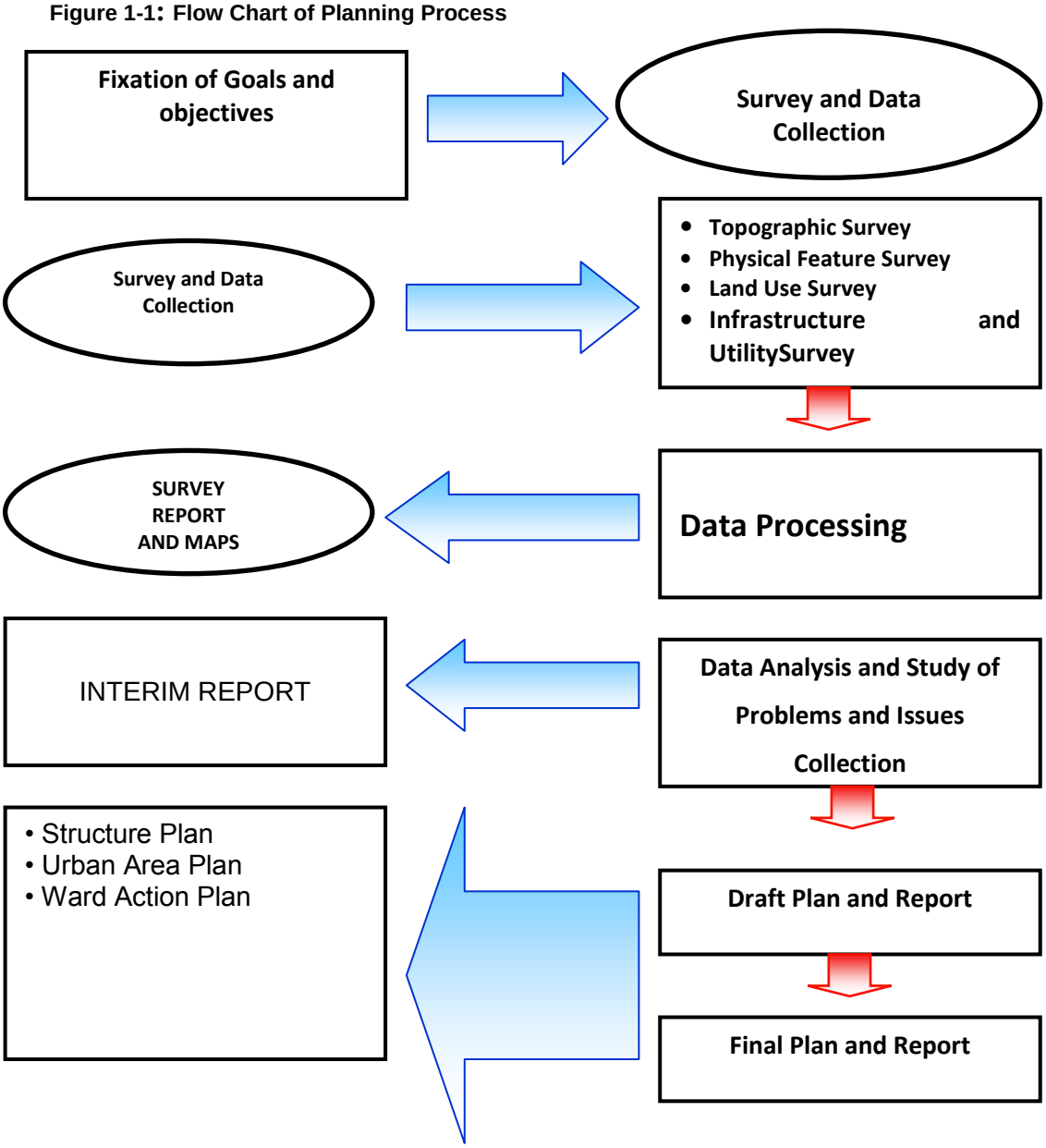
Provide guideline for development considering the opportunity and constrains of future development of the Upazila Town; andf. Prepare a 20-year Master Plan to be used as a tool to ensure and promote growth of the

Kumarkhali Paurashava in line with the guiding principles of the Master Plan and control anyunplanned growth by any private and public organization.

1.4 Approach and Methodology

The UTIDP Project is aimed for substantial development of infrastructure and services for thePaurashava with optimum provision of opportunities for Paurashava dwellers and making scope forextending services to surrounding areas.The current project is preparing a Master plan of the Paurashava, where the existing condition anddifferent problems are identified, studied and analyzed and the probable solutions are to be sought to ameliorate the same. The study moves through a process of data collection-analysis and fixation of objectives for planning. The approach is based on field survey for data collection and collection of information from secondary sources. The data is presented through maps, text and tabular form. Than the survey report and maps are prepared and submitted. Analysis of collected data is carried out to identify the nature and extent of problems prevailing in the Paurashava in order to fix the objectives of the actions to be undertaken in the form of planning and the interim report prepared and submitted. Through the process, involvement of the stakeholders has been ensured to make the planning as much sustainable as possible. For this purpose, continuous formal and informal discussions and meetings have been carried out throughout the project period using participatory approach. The discussions serve two purposes, first, a sense of belongingness develops within the minds of the stakeholders, particularly among the citizens, about the master plan to be prepared, and secondly, identification of problems and finding their solutions become easier with the participation of stakeholders, as the local stakeholders are more knowledgeable about local problems and possible solutions of those problems.

Figure 1-1: Flow Chart of Planning Process



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

Map 1-1: The location of Kumarkhali Paurashava within Bangladesh

1.5 Scope of Work

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

a) Visits have been made to the Paurashava at different stages of work of the preparation ofMaster Plan of Kumarkhali Paurashava .

b) Feasibility for preparation of Master Plan has been submitted to the office of the PD, UTIDP.

c) An Inception Seminar has been organized at the Paurashava level to inform the Paurashava about the scope and Terms of Reference for the preparation of Master Plan. A thoroughinvestigation has been made based on potential scope and opportunities available in thePaurashava to develop a 20 year development vision for it linking the ideas and view of the Paurashava people.

d) Determination of the study area and planning area has been done based on existing condition,demand of the Paurashava and potential scope for future development. A detailed survey hasbeen conducted on the existing conditions of socio-economic, demographic, transportation and traffic, physical features, topographic, and land use of the Paurashava area following the approved format and data have been collected from primary and secondary sources. Analysis of such data and information has been carried out to find out the possible area of intervention to forecast future population of the Paurashava (15-20 years), vis-a-vis assess their requirementfor different services, such as physical infrastructure facilities, employment generation, housing,right of way and land requirement for the existing and proposed roads, drains, playgrounds,recreation centres and other environmental and social infrastructure. The following major tasks have been accomplished:

- Identification and investigation of the existing natural and man-made drains, natural river system, the extent and frequency of floods, area of planning intervention have been done.Other works include study of the contour and topographic maps produced by the relevantagencies and review of any previous drainage Master Plan available for the Paurashava.
- A comprehensive (storm water) Drainage Master Plan for a plan period of 20 years has been prepared considering all relevant issues including discharge calculation, catchments areas, design of main and secondary drains along with their sizes, types and gradients and retention areas with preliminary cost estimates for the proposed drainage system.
- Recommendations have been made on planning, institutional and legal mechanisms to ensure provision of adequate land for the establishment of proper rights of way for (storm water) drainage system in the Paurashava.
- Collection and assessment of the essential data relating to existing transport Land Use Plan, relevant regional and national highway development plans, accident

statistics, number and type of vehicles registered for each Paurashava have been made.

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

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

1.6 Organization of the Master Plan Report

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

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

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

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

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

CHAPTER-2

INTRODUCTION TO STRUCTURE PLAN

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

2.1 Background of the Paurashava

As per the Local Government (Paurashava) Act 2009, the Paurashavas in Bangladesh arecategorized mainly into A, B, and C classes based mainly on annual income of the Paurashava.There is also a separate category called "Special Class", basically for industrial and commercial hubsof Narayanganj and Tongi within the Dhaka Metropolitan Development Area (DMDA) though these municipalities have already converted in City Corporation.The Paurashava came into existence in 1869 which indicaes that it is one of the oldest Paurashava in Bangladesh. To cite the national importance is the National road, Jessore Benapol Highway which passes through the Paurashava and very close location of the largest land port of Bangladesh. Shilaidaha Kuthibari, the famous residence of Rabindranath Tagore, is located within Kumarkhali Upazilla which is very close to Kumarkhali Pourashava.Now it has upgraded as is a 'A' category Paurashava and it lies on 23º 51' north latitude and 89º 15' east longitude in Kushtia District, has an area of 5.27 sq. km(1301.09 acre), divided into 9 wards with a population of 21914. Kumarkhali Paurashava consists of 9 Mouzas with 34 Mouza sheets. The outer boundary of Kumarkhali Upazila is Pabna Sadar Upazila on the north, Shailkupa Upazila on the south, Khoksa & Pangsa on the east and Kushtia Sadar Upazila on the west.

Kumarkhali, the third longest Upazila of Kushtia zila, is respect of population anything is definitely known about the ongoing of the Paurashava name. It is lead it that during the Mughal period, these posted one revenue collector named Kansas Kuli. It is genially believed that the Paurashava might have developed its name as Kumarkhali from the phonetic corruption of the name of that user. It developed as a prosperous hand loom industrial area on the bank of Garai River.

2.2 Vision of the Structure Plan

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

To guide long term growth within the Structure Plan Area by means of demarcation of the future growth areas and indication of potential locations of major development areas

includes: a) indication of important physical infrastructure; and b) setting out policy recommendations for future development. According to the Terms of Reference, the objectives of Kumarkhali Paurashava StructurePlan are:

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

Map 2-1: Kumarkhali Paurashava in Regional Setup

2.4 Concepts, Content and Format of the Structure Plan

Concepts

Structure Plan is a kind of guide plan, or framework plan, or an indicative plan that is presented with maps and explanatory texts in a broader planning perspective than other components of Master Plan. Structure Plan indicates the broad magnitudes and directions of urban growth, including infrastructure networks, the placement of major facilities such as hospitals and upazila complex. A Structure Plan is not intended to specify detailed lot by lot land use or local road configurations and development proposals. Rather it identifies the areas where growth and change are such that more detailed local and action plans are needed. Structure Plan does not require excessive effort in gathering data and it is flexible and dynamic and can be changed to accommodate demanded changes. The present Structure Plan is an overall long term strategic plan for the Paurashava*Shahar* (Town), Kumarkhali. Structure Plan is the 1st component of the Master Plan package. The other two lower level. Components are Urban Area Plan and Ward Action Plan. Structure Plan lays down the framework of the future plan including strategy and the sectoral policies. The Urban Area Plan and the Ward Action Plan detail out development proposals under the framework of Structure Plan. The extended area was selected in consultation with the Paurashava for possible extension of the Paurashava. But no development proposals are suggested for the extended part as existing Paurashava area is enough to accommodate population and services during Structure Plan period, that is, up to the year 2031.

Content and Format of the Structure Plan

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

2.5 Duration and Amendment of the Structure Plan

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

2.6 Structure Plan Area

From physical feature survey data it is found that the present area of the Paurashava is 1301.39 acres. Around174.48acres of land has recommended for extension considering its potentiality of wiich 95.98 acre are in beween Paurashava and Rajbari-KushtiaRegional Highway at north and 49.16 acre are in between Garai River and Paurashava area at south and another 30.53 acre area are for road extension and other purposes. Finally the

structure plan stands 1476.87acres of land. All the 9 wards of the Paurashavaare covered by Structure Plan area. The area of structure plan should consider as planning area.

Map 2-2: Jurisdiction of planning area of Kumarkhali Paurashava

CHAPTER-3

PAURASHAVA'S EXISTING TREND OF GROWTH

3.1 Social Development

Age-sex Structure

According to BBS 2001, combined age-group 0-9 comprises 19.42% and the age-group 10-17 years comprises the 19.09% of the total population of the Paurashava. Besides the population above 60 years is found to comparatively lower constitute only 6.06% of the population of the Paurashava.

Household Size

Out of total 5251 households' average household size is 1, 2, 3, 4, 5, 6, 7 and 8+ for 3.5%, 11.4%, 21.8%, 30.1%, 16.9%, 7.8%, 4.2%, 4.4% and 4.1% households respectively. The average size of household is 4.1. (BBS, 2011)

Marital Status

In the Paurashava 33.6% male and 21.6% female population of age 10 years and over was never married. In the same age group percentage of married male and female were 65.6% and 68.3% respectively. Percentage of widowed and divorced male was 0.7% and 0.1% respectively and percentage of widowed and divorced female was 9.3% and 0.8% respectively. (BBS, 2011).

Growth Rate

According to BBS, Population Census 2001, Growth rate of urban area in Bangladesh was 4.2% and total Urban Population was 28.8 million. Kumarkhali Paurashava is comparatively old Paurashava which attained its Paurashava status more than 140 years. In the year 2011 the growth rate of Kumarkhali Upazila area was 1.11%. Growth rate of Kumarkhali Paurashava has been calculated from population data of year 2001 & 2011, which is 1.07%.

Table 3-1: Population growth trend of Kumarkhali Paurashava

Administrative Unit	Growth Rate
Bangladesh (Urban area)	1.47 (BBS 2011)
Kushtia Zilla	1.11 (BBS 2011)
Kumarkhali Upazilla	1.11 (BBS 2011)
Kumarkhali Paurashava	1.07 (Calculated from population data of 2001 & 2011)

Source: Community Series (Zilla: Kushtia), Bangladesh Population Census-2011

The Paurashava area consists of both Urban and Rural characteristics and population growth rate can not be assumed similar to rural and urban part of the Paurashava. An attempt has been made to find out the difference of Growth rate between the core part and the fringe area with the help of Mouza wise population of BBS 2011. Annual growth rate for core parts are higher than fringe areas.But those estimated growth rates do not

reflect the real population increase rate. Accordingly the Growth Rate of Kumarkhali Paurashava is estimated to be 1.07% per annum.

Migration Pattern

Migration is one of the most important aspects for analyzing the demographic pattern of any place. From the socio economic survey very small percentage of the surveyed population in Kumarkhali Paurashava found to be migrants. Out of the total migrated people, most have migrated within the same Upazila. Only small percentage of the total migrated population reported to have migrated in the Paurashava from other districts. This reflects that still no such economic activities have been developed in this Paurashava to attract people from other places. Maximum migrated household settled in the the Core area of the Paurashava.

Educational status

According to the BBS report 2011 school attendance in the Paurashava was 79.65% for both sexes with 39.68% for male and 39.97% for female in the age group 6 to 10 years, 86.23% for both sexes with 43.69% for male and 42.54% for female in the age group 11 to 14 years and 36.94% for both sexes with 18.97% for male and 17.97% for female in the age group 15 to 24 years.

The educational status of the household head is quite satisfactory as observed from the Household Survey. The overall percentage of illiterate household head as observed from the survey had been 13.53%. Percentage of SSC/equivalent is (14.12%). Women are lagging behind in respect of education in all the levels.

Religion

According to latest population census report (2011), 87.91% of the population of this Paurashava belongs to Muslim community, 12.08% to Hindu community and 0.01% to other community. Population belonging to other religion such as Buddhist and Christian are 0 in number.

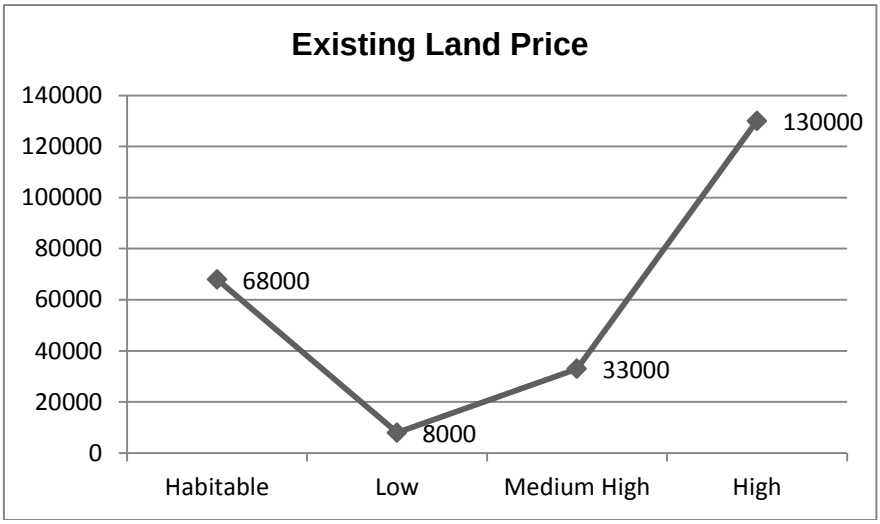
Land Value

Land value is an important determinant for any project related to the physical development because; the development depends on project cost and the cost on land value. In recent time, a rapid change of land value is found in the Paurashava premises. Wealthy people of the community are investing on land and became landlord because they consider it as a safe investment. As a result, land value curve is on upward. Value of land depends on location, accessibility, height and free of natural hazards. Following paragraphs discuss on land value of the study area.

Official Values

The official land value uses for calculation and collection of land revenue. In the physical planning aspects, study of land value is necessary for land acquisition. For the preparation of physical development project including cost involvement, an idea on land value is necessary. The value may be changed when development initiative will be undertaken. In this study, the official land value is being quoted from the actual value considers by the Sub-registry Office of the Kumarkhali Paurashava.

Figure 3.1: Average Land Value according to Land Types of Kumarkhali Paurashava



The land price varies in different parts of the Kumarkhali Paurashava according to the use and location of the lands. In the core part the land price is high than the fringe areas.

In this study, eight types of land in twelve mouzas are being considered. In the natural land market, land for homestead / housing construction (called Viti) is higher than other type of land and this scenario is prevailing in the Paurashava also. Land value is low for Doba and Pond type of land. Those two types of land are under the jurisdiction of agriculture land. For development activities, in case of land cost, those lands should be emphasized, though land development cost is higher than other type of lands.

Existing Practice/ Unofficial Value

Average value of different types of land for the Paurashava aredifferent. From which it is clearly observed that land value increases with the height of the land. It increases from low to medium high land but the maximum mean value is found for the high land (Tk.200000/decimal) and it is lowest for the habitable (Tk.5000/decimal).

Land value is highest in core area and it is around Tk. 5750000/decimal which implies the significance of core area. On the other hand land value is lowest in beel area.

Land Ownership Types and Patterns

Status of residence or ownership of dwelling places / land is a key socio-economic indicator. Residence status varies in the study area. The land ownership pattern often determines social power and position.

Major proportions of land under private ownership are owned by individuals and are used for residential purpose. From socio economic survey it has been revealed that small amount of landowner are available instead of large amount of landowner in Kumarkhali Paurashava. 43.24% of households in Kumarkhali Paurashava contain 1-5 decimals land, 28.20% households contain 6-10 decimal land, 12.06% households contain 11-15 decimal land, 8.24% households contain 16.-20 decimal land, 2.94% households contain 21-25 decimal land and 1.76% households contain more than 25 decimal land.

3.2 Economic Development

Two basic elements of economic development i.e. employment generation and increase of productivity are found in the cities and urban areas than the rural areas. This is a common phenomenon for the developed and developing countries. Employment opportunities act as a strong pull of the study factor for influx of job seekers in the cities and urban areas, the centers of productivity. Special features area are that it covers a vast rural area, besides a small urban center. Rajbari-Kushtia Highway passes through the Paurashava and both the sides of the highway is occupied by huge tracts of agriculture land and sporadic homesteads, at places showing the signs of development along with the hats, bazars indicating the dominant role of agriculture and also the industrial production. This indicates general feature of the study area as a mixture of rural and semi-urban nature. These special socio-economic features of the study area have been taken into consideration in conducting the study of the prevailing economic situation.

Industry

There are many textile mill, Saw mill, Rice mill and Handloom factories Kumarkhali Paurashava which are mostly run by private sector; there is no large scale industries like Sugar, Sericulture, etc. Also, Paurashava has a designated basic industrial estate which is Textile mill. Kumarkhali is an important center of the Bangladesh Handloom Board. About one hundred automated textile manufacturing units are located here. The Upazila is rich in cottage industries especially in handloom, weaving and pottery.

Commerce

The commercial activity largely comprises of wholesale operation involving agricultural produces like paddy, wheat, jute and sugarcane.

In Kumarkhali Paurashava the main bazaar is located in Ward No. 5 which is adjacent to the Kumarkhali Bazar Road. There are also some small markets exist which provide the daily necessities for the local people. Maximum commercial structures are concentrated at Ward Nos. 5 & 6 (37.79% & 39.16%), where the Kumarkhalibazaar and markets are located. KumarkhaliBazaar place is the centers of economic activities in the project area. In the project area, activities of wholesale and retail trade; hotel and restaurant; transport, storage etc. are conducted in bazaar area. Major portion of trade and commerce of the project area is conducted through the bazaar, where agricultural products, consumer items and other farm and non-farm items are transacted. Therefore, the bazaar has significant role on the economy of the project area. The bazaar of the project area also has the significant role to provide good number of employment and act as the economic center for the area.

According to BBS 2001, 34.67% population found engaged in business in the Paurashava and about 19.59% households found depend directly on regular employment, as the main source of income. Again from the Household Survey small business shows the dominant occupation as is revealed and percentage of the people in this occupation is 37.65%, where there is only little number of female participation.

Besides various goods and commodities are brought by the traders and business persons from outer parts of the project area and are trading in the market of the project area. This market serves as the meeting places of the growers & producers, buyers & consumers, traders-both importers & exporters including intermediaries in the surrounding area of Bangladesh. KumarkhaliBazaar deal with agricultural commodities viz. rice, pulses, vegetables, fruits, fishes, fish fry, fish feed, medicines, chemical fertilizers, pesticides, food stuff, household goods, cloths, industrial items, cosmetics and perfumery items, books and educational items, poultry and cattle and host of other items of day to day necessity. This market is specialized in the trade of fish, fish fry or cattle.

Services

There are social, businesses, and personal services apart from NGO activities and Go (government) offices like TNO complex. There is health Clinic which generates considerable service activities. The Informal sector activities hold considerable no. of people rendering manufacturing, repairing and personal services. These are barbers, domestic servants, Tailors, iron smiths, shoe-shiners, washer men, etc.

In Kumarkhali Paurashava, total output of the service sector consists of the public administration and defense; storage and communication; financial intermediations; education; renting and business activities; health, community, social work; and social and personal services activities. People also engaged with the service sector by working in fire service, water pump house, transport, electric and Gas, club house etc. According to BBS 2011, 72.93% populationfound depend directly on services, as the main source of income. Nationally the share of the services sector to GDP growth is 53.4% in FY 2010 which was 52.6% in FY 2009 and 50.0% in FY 2008 (State of the Bangladesh Economy in FY 2010-11, P-65).

Occupational Status

The Occupations of Household head like Casual wage employment, Salaried employment, Self employed – non-agriculture, Self employed – agriculture and Others (construction, transport etc.) are mainly found in the Upazilla towns of Bangladesh with some government and non government services. Nearly 50 percent of the poor in rural areas and more than a third of those in urban areas reside in households where the main occupation of the head is casual wage employment. While the formal sector is growing over 80 percent of employment is still concentrated in the informal sector Casual wage earners are those engaged largely on day laboring, either consistently throughout the year or intermittently depending on the impact of the seasons on their agricultural employment. Casual wage earning occurs in both urban and rural areas of Bangladesh.

Primary Occupation

Primary occupation means work that involves taking raw material from the environment such as farmers, fisherman, miners etc. With 45% of the workforce engaged in the primary sector (Economy Watch, 2008); Bangladesh can be called an agrarian economy. Agriculture contributes 30% of the country's GDP and enables Bangladesh to achieve its macroeconomic objectives, including food security, poverty alleviation, human resources development and employment generation. Cooperatives are increasingly motivating

farmers to employ modern machinery. Bangladesh primarily produces jute, rice, tobacco, tea, sugarcane, pulses and wheat. According to the composition of sub sectors, the crop sector contributes 72% of the production, followed by Fisheries at 10.33%, livestock at 10.11% and forestry at 7.33%. The unpredictable weather and natural calamities disrupt the country's economy frequently. To overcome this problem, the government has constructed several irrigation projects to conserve rainwater and control floods. The projects also include controlling pests and using high quality seeds.

In Kumarkhali Paurashava main primary occupation is Business (34.67%) followed by Regular Employment (19.59%), Handloom (8.57%), Non Agriculture Labour (7.57%), Others (7.11%), Transport (6.65%) and Industry (6.07%) etc. (BBS, 2001) Again an enormous variety of water bodies, including Rivers, irrigation canals, flood plains, beels (large depressions), ox bow lakes and ponds are dispersed throughout the Paurashava and many people engaged with fishing. People of Kumarkhali Paurashava also engaged with farming like poultry, dairy etc. From the Socio economic survey during the period of 2009 occupation like small business is found highest and it is 37.65% among other occupations. Skilled Labor found to be the second highest percentage which is 19.41%.

Secondary Occupation

Secondary occupation means occupation which some one undertakes any work after taking a primary occupation. In Kumarkhali Paurashava a number of households do secondary jobs seasonally to raise their family income. Mostly the low income groups take secondary occupations during off season when they do not have any regular jobs. Secondary jobs include, day labouring, farmimg and similar other occupations.

Income level

The income and the expenditure pattern of an area is the index of the socio-economic status of that area. The data collected through household survey shows that most of the households fall in the low to lower middle income group. About 66.47% of the total surveyed household is in the income level BDT 3501-8000 which is the highest share of percentage. The income level BDT 8001-13000 comprises second highest percentage (15.59%) of the households in the Paurashava.

Expenditure Level

The highest maximum expenditure (12000 tk) is for food and lowest maximum expenditure (500 tk) is for water. Highest minimum expenditure (400 tk) is for food. Minimum expenditure for house rent, water, fuel, health care, education, transport and recreation is 0.

Agriculture

The agriculture performance of the Paurashava in the year 2001-2007 is largely production of paddy, Jute, vegetable and spice. The surrounding fringes area encircling the Core of the Paurashava is mostly under agriculture use.These are mostly under Paddy Cultivation like HYV rice, Paddy Wheat are cultivated extensively in this Upazila.

Agriculture is the backbone of our national economy. However, it has been observed that the contribution of this sector to GDP has been reducing gradually. In FY 2010, the

contribution of agriculture sector to GDP Growth was 15.5, where as it was 14.0 in FY 2009. According to BBS 2011, 19.76% population found engaged in industry in the Project area. In the project area, about 7.31% population found to depend directly on agriculture (agriculture labour), as the main source of income.

439.57 acres of lands are used in agricultural purpose which is 33.78% of total land of the Paurashava. In case of ward wise distribution of agriculture land, Ward No. 9 contains highest (28.16%) amount of agricultural land. The socio economic survey reveals that nearly 3.82% people of the study area are directly engaged in agriculture sector as farmer and as agricultural day labor. Among the agricultural produces the important items besides paddy are various native fruits, vegetables, timber, fishes. Economy of all the wards of the project area is basically agrarian in nature. Agricultural land, ponds and ditches, livestock & poultry etc. are main economic resources of these wards.

Major agricultural products of Kumarkhali Paurashava are Aus (local and HYV), Aman (local and HYV), Boro, maze, Wheat, mustard, sweet potato, sunflower, onion, garlic, betel leaf, tobacco, sugarcane.

Livestock and poultry sub-sector also contribute significantly to the economy through providing employment, especially employment to women of the rural areas at homestead level. Household based dairy, poultry in the villages under the project area is a subsidiary source of family income which is mainly run by the women like elsewhere in Bangladesh. Mini-poultry farms are found flourishing in the project area and farm poultry i.e. broilers being cheaper than native chicken; there are a good number of consumers especially in the lower income families.

So, it is imperative that the agriculture sector in the project area should be nourished through introducing scientific method of cultivation, cultivation of paddy and fish in the low lying lands. Besides, providing credit facilities to the farmers on easy terms, assisting in marketing their produces without interference of the middlemen, 'farias' and providing all sorts of cooperation in conducting farm activities by the concerned Upazilla Agriculture Offices can boost up the agrarian sector of the project area. Primary agricultural sector including the sub-sectors like forestry, fishery and livestock and poultry should be brought under intensive effort to develop and thus contribute more to the overall economy in the coming days. In order to reap maximum benefit from agriculture, attention has to be given so that high value agricultural lands are not invaded by urbanization.

Agro-based commercial and industrial activities

The Agro-based industries/activities are mostly found in large sugarcane production in the Paurashava. Also, Mango, banana, jackfruit, papaya, kamranga cultivation takes place in the Paurashava.

The economy of Kumarkhali Paurashava largely depends on agriculture. Most of the agricultural products are produced in the Paurashava. The major crops are paddy, maze, pulse, chilli, turmeric and different kinds of vegetables etc. These products are being sold after fulfilling the demand of the local people.

Kumarkhali Paurashava has markets to export the agricultural products. The market base is not too strong for lack of developed communication system. If the transportation as well as communication system can be developed then the other Upazilla can take part in the export and import activities. The agro products of Kumarkhali Paurashava can be exported to other areas. As a result the market will be stable enough to create a strong base for the economy of the Paurashava and it will help the Paurashava to be developed economically.

Employment Pattern

Existing employment pattern are mostly Small and Large Business Household work, Agriculture, Transport (Bus, Van, Rickshaw pullers, Nasimon, Korimon etc drivers) & related mechanics. Few are in service sector like hotel and restaurants and in small business activities. Service related employments are govt. service holders, NGO workers, school teachers, private business office service holders etc. Small business is highest and then comes Agriculture. The current employment pattern in the Paurashava is basically gives impression that unless significant non-again development takes place; the employment will remain with small business sector.

From the BBS- 2011, it is revealed that the economically active age group of population (10 to 59 years age-group) 74.53 percent of the total population in the project area. According to population census the main source of household income in the Paurashava is service (72.39%) followed by industry (19.76%) and agriculture (7.85%) etc.

The major occupations found are business, farming, fishing and trading, services in government, non-government and private organizations, day-laboring in agriculture, industry and services sectors, informal activities and host of other professions. From the Household Survey it is revealed that the small business sector activities are the dominant occupation class in the town. The percentage of the people engaged in this occupation is 37.65%, where there is small female participation. The next highest occupation class found is the skilled labor. Most of the households' earning members often adopt a secondary occupation which indicates that under-employment is very much prevalent in the project area.

Women are mostly involved in the professions like Government and non-government though the percentage is notably lower than that of the male. A small number of women are engaged in day labor.

In the project area, most of the economically active population whose age is 10 years and above are involving in manufacturing, business and transport sector. BBS statistics (2002-03) shows that 30 percent of national level urban economically active population are involved in manufacturing and transport sector followed by 28 percent in Trading and Business, 22 percent in agricultural sector and 15 percent in service and only 5 percent is categorized as others.

Informal Economic Sector

The Informal sector economic activities are mostly very petty-trading activities involving silting on the ground besides a road or market place or hawking from door to door. The

activities falls or classified as Informal are: (i) Personal Services (barbers, domestic helpers, tailors, (ii) Repair services (Machine: Shallow Tubewell, pump, radio/cassette, watch) and manufacturing (Handlooms, molasses/ gur, pottery, Trunk making,). Besides above, Paurashava has other types of Informal activities.

In the project area congregation, such informal sector activities are found concentrated. Informal sector of the project area covers a variety of activities and a substantial number of unskilled Labor forces are engaged in this sector. Informal sector economic activities cover a lot of activities which may broadly be classified under Trading and Services activities. Various types of mobile or immobile sales of items like food, fish, nuts, vegetables, daily household items, old cloth/garment; repairing of household gadgets, electronic items like radio, television etc. and services like hair cutting, shoe polishing, repairing, etc. are considered as informal economic activities.

It was found that the informal entrepreneurs mainly perform their business in Kumarkhali Bazaar area and besides the Jessore Benapol Highway. Males overwhelmingly dominate the informal sector in the project area. The informal sector of the project area is mostly run by the 16-50 age groups. Of the various occupations, trades included sale of various food items, clothes, vegetables, meat, seed, medicines etc. and services included haircutting, shoe repairing, mobile phone servicing, tailoring etc. Most of the consumers of the informal sector are from middle-income group. It has been found all Informal entrepreneurs run their business throughout the year.

3.3 Physical Infrastructure Development

One of the major challenges in the project area is the promotion of planned growth. The physical growth of the project area should be planned to embody efficiency, productivity, beauty and environmental sustainability. In this chapter physical growth structure of the Paurashava has been analyzed. Besides, constraints and opportunities of the planned physical growth of Kumarkhali Paurashava have also been tried to identify.

Growth of the Paurashava is centered in the middle of the Paurashava. The core area consists of entire ward-4, ward-5, ward-6 and ward-7 and. Physical growth has actually taken place all over the Paurashava.

Physically, the Paurashava is established as an administrative center in 1869. The Paurashava's physical development is almost evenly distributed all over the Paurashava. The river is located in Western side of the Paurashava. The main bazaar or commercial hub is situated in Core area in ward-5 amidst mixed use and coupled with residential development. Physically, Paurashava also has a settlement growth in the other Wards of the Paurashava. In between wards and surrounding areas, slight agricultural land in rural setting exists. These are fringes along the Paurashava periphery.

Expansion of agriculture, textile, HYV farming and related commercial activity together with development of Growth Centers in surrounding areas of Paurashava, will induce much physical growth. The surrounding Growth centres are well connected with roads

and the development of Growth centres with good infrastructure facilities which has already taken place, will contribute in the prosperity of Paurashava.

The dominant landuse of the Paurashava is residential and located all over the Paurashava. It is centrally juxtaposed with other uses like main Commercial hub with surrounding mixed use zone. The Gov't zone, mixed use zone, Education and Service Activity etc that has already taken place will induce physical growth in the middle part of the Paurashava encompassing wards- 1, 5, 6 i.e, along the Rajbari to Kushtia Road. The commercial uses stretched all along the Bazar Road. Area under mixed use is located in the core of the Paurashava. Specific large zone of Service activity is located in Ward-5 and Ward-6.

Though the surrounding mauzas encompassing the nine wards comprises as catchment area, but all of these are continuation of agricultural land from the nine wards. Generally, it is vacant agricultural land, small in size and located within and around the edge of all the nine wards.

Road

Road network is the main transportation facility in Kumarkhali Paurashava . Roads are generally three types. They are Pucca road, Semipucca road and Katcha road. The field survey data reveals that total amount of road in the Paurashava area is 65.48 km out of which 46.78 km is Pucca road, 5.91 km is brick soling Semipucca road, 12.79 km is Katcha road.

Ward - 6 has highest network length of roads. Around 14.26 km in Ward-5, around 9.11 km in Ward-5 under the three categories of roads. Ward-6 has highest (10.14 km) length of pucca roads followed by Ward-5 and Ward-7. Ward-1 has highest (1.82 km) semi-pucca road and Ward-6 has highest katcha (3.44 km) roads.Ward wise distribution of road types along with their area coverage and lengths have been shown in Table 3.2.

Table 3.2: Ward wise Road Types with Road Area (Acre) and Length (m).

Ward No.	Pucca		Semi-pucca		Katcha		Total	
	Length (KM)	%	Length(KM)	%	Length(KM)	%	Length (KM)	%
1	3.99	8.52	1.82	30.81	1.68	13.12	7.48	11.43
2	2.53	5.41	0.37	6.20	0.43	3.39	3.33	5.09
3	4.14	8.85	0.67	11.37	0.91	7.12	5.72	8.74
4	2.70	5.78	0.45	7.61	0.41	3.20	3.56	5.44
5	7.97	17.04	0.59	9.94	0.55	4.33	9.11	13.91
6	10.14	21.69	0.68	11.49	3.44	26.88	14.26	21.78
7	5.26	11.25	0.02	0.36	1.09	8.51	6.37	9.73
8	4.51	9.65	0.62	10.55	1.07	8.35	6.21	9.48
9	5.53	11.82	0.69	11.67	3.21	25.10	9.43	14.40
Total	46.78	100	5.91	100	12.79	100	65.48	100

Source: Land Use Survey by DDC, 2009-2010

Road network has not developed in a planned manner and has not any definite street pattern. All the local roads are of irregular street pattern, which are also narrow and crooked in nature. The secondary/distributor roads are 16-20 feet width and the collector

roads are 8-10 feet width. Road side vegetation and street light system were not found in the Paurashava area.

Waterways
Garai River flows through the Paurashava and water way network is quite developed in the Paurashava.This river also connected with adjacent urban centers. Presently, this river is not used fully. Business men of construction material such as sand, brick, timber and logs are using this river mainly. It would be a wonderful resource if water transportation system can be improved with its loading-unloading facility.

Railway
About 3.54 km railway is found in the Paurashava.

Airway
There is no airport in Kumarkhali Paurashava.

Water way
One boat ghat is found on the bank of Garai River in the Paurashava. The boat ghat is under the jurisdiction of Paurashava authority. Construction materials such as sand brick and timber are carrying by boat from small growth centres adjacent to the Kumarkhali Paurashava to the Paurashava.

3.4 Environmental Growth

The plan has documented Kumarkhali Paurashava area's environmental conditions, determines potentiality for present and past site contamination (e.g., hazardous substances, petroleum products and derivatives) and identifies potential vulnerabilities (to include occupational and environmental health risks).

Kumarkhali Paurashava is almost similar to any other typical Paurashava of Bangladesh. Among the identified issues of probable threat and risk, drainage problem and improper solid waste management are mentionable. The risk of arsenic is also unavoidable although no arsenic patient has been found in the Paurashava. Due to siltation and illegal encroachment, the natural drainage canals have lost their capacity to drain out discharges. As a result water logging has become a regular problem in the town. Environment of the Paurashava would be degraded violently if proper steps are not taken. At present, it has been found that there is no proper solid waste management system in the Paurashava. Throwing out all wastes here and there is the major cause of deteriorating the environment. Proper enforcement of Paurashava ordinanace and other relevant environmental acts and ordinances could improve the situation and therefore is suggested. Other threats to environment of the Paurashava are air pollution, water pollution; land pollution, noise pollution etc. The main source of air pollution in this Paurashava is emission of harmful gaseous matters from vehicles; open dumping of household, poultry farms, hospital waste, industry etc. Dumping of garbage to open land and ditches make odor.

Water pollution is yet another threat to the living environment of Kumarkhali Paurashava. Surface water is being contaminated from improper sanitation, solid waste disposal, hospital waste, chemicals (fertilizers and insecticides) etc. Hospitals in

Kumarkhali Paurashava are producing bacteriological contaminated wastes. A portion of such wastes are dumped into the canal and beside the road causing surface water pollution. Most of the people reported that there exists ground water pollution in Kumarkhali Paurashava due to prevalence of iron. If it is not removed by appropriate water treatment may cause chronic intestinal diseases leading to increase in health care expenditure of the Paurashava inhabitants.

Land pollution occurs due to improper management of domestic wastes. Discharge of industrial wastes and use of chemical fertilizers and pesticides have contribution to land pollution. Another major concern, the noise pollution in Kumarkhali Paurashava is mainly attributed to the movement of thousands of traffics through the regional road passing through the Paurashava; especially, areas adjacent to both sides of Regional road are affected by noise pollution. There is also one bus stoppage which produces huge noise. Moreover, high concentration of commercial activities in the main bazaar area makes the area susceptible to noise pollution.

Urbanization concentrates people in urban growth centers and increases the demand of land for housing, industrial use, educational, office building, cultural, commercial use of land, road and infrastructures. On the other hand, these activities will reduce agricultural use of land, water bodies and other natural resources causing serious reduction in fish habitat, fish population and diversity, extinction and reduction of wildlife including birds, reptiles and mammals, loss of many indigenous plants, weeds and shrubs, deterioration of living conditions, degeneration of wetland based ecosystems, occupations, socio-economic institutions and culture.

The area of the Paurashava is gradually expanding towards its outskirt within the Upazilla. People are buying comparatively the low cost agricultural lands and are making their homestead. Gradual development sprawl is encroaching upon the surrounding agricultural lands which pose threat to environment. Besides, being located along the regional road, Kumarkhali Paurashava has greater potentiality of development and expansion. If it is not properly controlled then there will be unplanned development. So, proper measure should be taken to control unplanned development and to minimize the adverse environmental impacts.

3.5 Population

In the project area, present population (2011) is about 21914. Ward wise population distribution of Kumarkhali Paurashvaa have been shown under the following Table 3.3.

Table 3.3 Population Distribution of Kumarkhali Paurashava

WardNo.	Total Population(2001)	Percentage(%)	Total Population(2011)	Percentage(%)
1	2266	11.50	2305	10.52
2	1880	9.54	1994	9.10
3	1828	9.28	2018	9.21
4	1804	9.15	1766	8.06
5	1910	9.69	2477	11.30
6	2474	12.55	2903	13.25

WardNo.	Total Population(2001)	Percentage(%)	Total Population(2011)	Percentage(%)
7	2639	13.39	2923	13.34
8	2720	13.80	3013	13.75
9	2186	11.09	2515	11.48
Total	19707	100	21914	100

Source: BBS, Population Census, 2001 & 2011.

The Table 3.3 reveals that in 2011 Ward No. 8 has the highest population with 13.75%, followed by Ward No. 7 (13.34%), Ward No. 6 (13.25%) and Ward No. 9 (11.48%) respectively. On the other hand Ward No. 4 (8.06%) has the lowest population.

The population density for the entire country was approximately 755 people per square kilometer in 1991, and increased to 834 people per square kilometer in 2001. Ward wise population density of Kumarkhali Paurashava of the year 2011 have been shown in Table 3.4.

Table 3.4: Ward wise Population Density of Kumarkhali Paurashava

Ward No.	Land Area (sq. km)	Density/ Sq. km-2001	Density/Sq. km-2011
1	0.60	3777	3842
2	0.20	9400	9970
3	0.28	6529	7207
4	0.15	12027	11773
5	0.46	4152	5385
6	1.04	2379	2791
7	0.45	5864	6496
8	0.60	4533	5022
9	1.48	1477	1699
Total	5.27	3739	4158

Source: BBS, Population Census 2001 and 2011.

Population density of the Paurashava area is found 4158/ sq. km in the year 2011 where it was 3739/ sq. km in the year 2001. The highest density exists in Ward No. 4 and then lowest is found in the Ward No. 9. As the core/potential part of the Paurashava covers Ward Nos. 2-7 so density of population has been found higher in these wards comparing to the other wards of the Paurashava.

Map 3-1: Existing Growth Potentiallityof Kumarkhali Paurashava

3.6 Institutional Capacity

The Paurashava is responsible for Paurashava administration and also responsible for providing services, slum upgrading, infrastructure development and licensing of non-motorized transport within its jurisdiction. To perform the responsibilities efficiently as prescribed in the "Local Government (Paurashava) Act 2009"existing capacity of the Kumarkhali Paurashava administration is not sufficient. The responsibility may be categorized as two broad heads named Revenue Collection including Budget Preparation and Delivery of Services. Three types of management system are involved with those two responsibilities and they are Top Management, Middle Management and Supervisory Management. A general scenario is found in those three category management system of the Paurashava i.e. lack of efficient manpower. Shortage of technical manpower in the Paurashava is also an administrative problem.

Existing Manpower

There is acute shortage of manpower in each section of the Paurashava. Existing manpower scenario of KumarkhaliPaurashava is horrible. There is acute shortage of manpower in each section of the Paurashava. Paurashava has only 37official against 91 official mentioned in Paurashava organogram. There is no Chief Executive Officer, Health Officer. Engineering Division is not well established. As a traditional system of the Paurashava, engineer and secretary are appointed directly by the Ministry of Local Government and other staffs are appointed locally through the approval of the Ministry after the advertisement on the newspapers. In KumarkhaliPaurashava, the revenue income is low. That's why it is not capable to pay the salary to all the officials and staffs. And the salary is recovered from the government grant. This is the main reason for understaffing of the Paurashava. This is the main reason for understaffing of the Paurashava.

After analyzing the existing organogram of Kumarkhali Paurashava it is found that there is a gap between the standard manpower and existing manpower. The comparative picture of this organogram is shown in Table- 3.5.

Table 3-5: Allocated & Existing manpower for Kumarkhali Paurashava

No.	Department/ Section/ Designation	Allocated Manpower	Exising Manpower	Existing Manpower Percentage (%)
Engineering Department		32	29	90.63
1	Executive Engineer	1	1	100.00
2	Asst. Engineer	1	1	100.00
3	Sub- Asst. Engineer	3	2	66.67
4	Other Staffs	27	25	92.59
Administrative Department		74	22	29.73
5	Secretary	1	1	100.00
General Section		14	7	50.00
6	Administrative Officer	1	0	0.00
7	Head Assistant	1	1	100.00
8	Other Staffs	12	6	50.00

No.	Department/ Section/ Designation	Allocated Manpower	Exising Manpower	Existing Manpower Percentage (%)
Accounts Section		4	3	75.00
9	Accounts Officer	1	1	100.00
10	Accounts Assistant	1	1	100.00
11	Other Staffs	2	1	50.00
Assessment Section		3	2	66.67
12	Assessor (Tax)	1	1	100.00
13	Assistant Assessor	1	1	100.00
14	M.L.S.S	1	0	0.00
Tax Collection/ Bazar Section		10	8	80.00
15	Tax Collector	1	1	100.00
16	License Inspector	1	1	100.00
17	Asst Collector	6	4	66.67
18	Other Staffs	2	3	150.00
Market Inspection Section		3	1	33.33
19	Market Inspector	1	0	0.00
20	Collector	1	1	100.00
Education/ Cultural/ Library Section		18	0	0.00
21	Education and cultural Officer	1	0	0.00
22	Librarian	1	0	0.00
23	Teacher	10	0	0.00
24	Other Staffs	6	0	0.00
Health, Family Planning and Sanitary Department		23	11	47.83
25	Health Officer	1	0	0.00
26	Conservancy Inspector	2	1	50.00
27	Sanitary Inspector	1	0	0.00
28	Health Assistant	2	1	50.00
29	Vaccination Supervisor	2	2	100.00
30	Booster	6	0	0.00
31	Other Staffs	9	7	77.78

Source: Kumarkhali Paurashava, 2012

Paurashava Town Planning Capacity

At present there are no Town Planning personnel in Kumarkhali Paurashava. For Town Planning works educated, experienced and trained professional man-power is required. All town planning works have been performed by the Engineer Section headed by one Executive Engineer. The Mayor and the Counselors are actively guided and control merely the physical development activities on the basis of local need and demand.Town planning capacity of Kumarkhali Paurashava is non-existant. There is no graduate planner working in this Paurashava. Considering current manpower and logistic situation of Kumarkhali there is reason to believe that the Paurashava may not support spatial planning and implementation activities unless immediate steps are taken to overcome such short comings.

Implementation Capacity of the Paurashava Master Plan

Preparation of Master Plan has been continuing by the consulting firm under the supervision Government Engineering Department When the preparation of Master Plan

will be completed then the implementation will be started. The existing technical manpower of Kumarkhali Paurashava shows that the Paurashava is not capable to implement the Master Plan project. Even no one organization/body can claim that they are alone is capable enough to implement the Master Plan. Rather Paurashava Authority, different government departments and private sector together can step by step implement the Master Plan.

Proper knowledge about planning and development rules and regulations are found missing to both among people's representatives and officials of the Paurashava. Therefore appropriate trainings are required for Paurashava personnel to enable them preparing their own Master Plan and implementing the proposals of such Master Plans. Proper implementation of Master Plan proposals needs a team of professionals comprised with qualified town planner, GIS analyst, civil engineer, demographer, sociologist, and logistic support of modern survey and other equipments.

Conservancy and Health Services

Kumarkhali Paurashava has a conservancy department to manage the solid waste management system like many other Paurashavas of Bangladesh, but there is few dustbin found in this Paurashava. It was reported and proved that, the authority did not maintain formal dumping system. Wastes are dumped where it is generated. The Paurashava authority could not ensure the prohibition of waste dumping station. People are used to manage their household generated solid wastes either with their own efforts or through out here and there.

The conservancy department of Kumarkhali Paurashava has only 3 garbage truck and few vans for solid waste management which is too poor to manage the whole system properly. The municipal authority could not take any measures to prohibit its inhabitant from indiscriminate dumping of solid wastes into the canals which results in blocking of drainage system.

Logistic Support / Equipment

Local Government should have the right to mobilize resources from various sources in addition to the conventional ones which are mostly top down, guided and controlled allocation of the central government. Such top down resources are generally tied and the local government have limited discretionary authority to use such resources. Local governments need additional resources to address the growing needs and demand for goods and services at the local level. But conventional sources of local resources would hardly be enough to respond to the growing demand and expectation of the local community. According to organogram Paurashava should have three motor cycle, four bicycles and two photocopiers, feeder machine, duplicating machine whereas Kumarkhali Paurashava has no such machineries to support its official activities. This Paurashava unfortunately has no such equipments. There are only 2 road roller and 3 garbage truck found in the Paurashavaas logistic support.

3.7 Urban Growth Area

The Paurashava's physical development is almost evenly distributed all over the Paurashava. The river is located in Western side of the Paurashava. The main bazaar or commercial hub is situated in Core area in ward-5 amidst mixed use and coupled with residential development. Physically, Paurashava also has a settlement growth in the other Wards of the Paurashava. In between wards and surrounding areas, slight agricultural land in rural setting exists. These are fringes along the Paurashava periphery.

Expansion of agriculture, textile, HYV farming and related commercial activity together with development of Growth Centers in surrounding areas of Paurashava, will induce much physical growth. The surrounding Growth centres are well connected with roads and the development of Growth centres with good infrastructure facilities which has already taken place, will contribute in the prosperity of Paurashava.

The dominant landuse of the Paurashava is residential and located all over the Paurashava. It is centrally juxtaposed with other uses like main Commercial hub with surrounding mixed use zone. The Gov't zone, Mixed use zone, Education and Service Activity etc that has already taken place will induce physical growth in the middle part of the Paurashava encompassing wards- 1, 5, 6 i.e, along the Rajbari to Kushtia Road. The commercial uses stretched all along the Bazar Road. Area under mixed use is located in the core of the Paurashava. Specific large zone of Service activity is located in Ward-5 and Ward-6.

Though the surrounding mauzas encompassing the nine wards comprises as catchment area, but all of these are continuation of agricultural land from the nine wards. Generally, it is vacant agricultural land, small in size and located within and around the edge of all the nine wards.

3.8 Catchment area

It is an important growth centre of this region. The major land use of the study area is residential. It is well connected with other region of Bangladesh by road. The Paurashava is connected with Jhenaidah, Kushtia upto Chuadanga and Rajbari upto Faridpur with road. The total number of structure in the Paurashava is 8842 including business holding. There are many textile mills in this Paurashava. Garai river pass besides the Paurashava and the river is used as waterway transportation. Therefore, Kumarkhali Paurashava carries national importance.

It has large number of Tanks /Ponds, Ditches and natural water bodies (rivers and canals), fertile soil including rich fishery and agricultural production. The Paurashava produces sugarcane, betel nut and coconut which have been supplied to entire country. It attracted huge in-migration by people. There is increasing growth rate and migration. As per last census, 2001, the divisional population was, about 14.60 million, and currently it exceeded to 16.84 million and expected to reach 19-20 million by the year 2027. According to 2001 census, National projection, population of Khulna Division's all Municipalities will be 5.34 million in 2030 and in 2011, it will be 2.79 million. It will almost

double in size in 2027. In 2001, the National urban population was 23.51% with a growth rate of 3.30%.

3.9 Landuse and Urban Services

Landuse

Land Use Survey explains the current arrangements and distributions of all types of land uses. Land Use Survey has been conducted by recording the current uses of land according to its functional activity such as residential, industrial, commercial, agricultural, open space, vacant land, water body etc. Different land uses of the Paurashava have been classified according to the provisions spelled out in the Terms of References (ToR) for the present project. Table 3.6 shows the distribution of existing land uses of KumarkhaliPaurashava.

Table 3.6: Existing Land Use of the Project Area (in acres)

No.	Landuse	Area in Acre	Area (%)
1	Agricultural	439.57	33.78
2	Circulation Network	90.69	6.97
3	Commercial	28.25	2.17
4	Community Services	5.65	0.43
5	Education & Research	18.42	1.42
6	Government Services	15.11	1.16
7	Industrial/ Manufacturing Processing	19.60	1.51
8	Mixed Use	3.49	0.27
9	Non Government Services	0.29	0.02
10	Recreational Facilities	3.62	0.28
11	Residential	488.92	37.57
12	Restricted Area	0.00	0.00
13	Service Activity	7.50	0.58
14	Transport and Communication	0.66	0.05
15	Urban Green Space	3.29	0.25
16	Vacant Land	14.32	1.10
17	Water body	162.00	12.45
18	Forest Area	0.00	0.00
19	Miscellaneous / Others	0.00	0.00
Total		1301.39	100

Source: Land Use Survey by DDC, 2009-2010

From Land Use Survey, total land area of Kumarkhali Paurashava was found to be 1301.39acres or 5.27 sq. km. Most dominant land use type in the Paurashava is residential which is 37.57% of the total land area. In the Paurashava commercial, administrative and educational land uses are predominantly concentrated in the middle part of the Paurashava (Ward Nos. 5 & 6). North and southern part of the Paurashava are mainly used for agricultural, graveyard and other purposes. The Paurashava does not have any land belonging to 'Restricted Area', and 'Forest Area'categories.

Existing land use types and distribution pattern have been shown in the Map 3.1. Important land use types that exist in the project area are described as the followings:

Residential

Total residential land of Kumarkhali Paurashava is 488.92 acres, which is 37.57% of total area. Ward No. 9 contains the highest amount of residential land use (85.17 acres) where as Ward No. 4 covers the lowest (28.47 acres) of residential lands.

Commercial

Commercial land use mainly comprises of different types of shop (book shops, cloth shops, departmental store, grocery shops, stationary shop etc.), market, Katcha bazaar and other lands being used for commercial purpose.Total commercial land of Kumarkhali Paurashava is 28.25 acre, which is 2.17% of total lands of the Paurashava. Ward No. 6 covers 14.78 acres commercial land which is the highest use of land in commercial purposes, where as Ward No. 5 contains 9.43 acres and Ward No. 1 contains 1.92 acres of total commercial land of the Paurashava. Rest of the Wards of this Paurashava contains a very insignificant share of land for commercial uses. Within the Paurashava, Ward No. 3 has the lowest area (0.18 acre) earmarked for commercial use.

Industrial

Industrial/Processing and Manufacturing activity in Kumarkhali Paurashava mainly includes rice mill, saw mill, ice factory, seed processing industry, bakery factory and other manufacturing and processing activities. Survey revealed that Ward 5 has the highest level of land uses (29.36%) 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. Ward 6 has 21.12% of such land use.

Agricultural

Around 439.57 acres of land of the Paurashava is under agricultural use. It appears from field survey that Ward 9 has maximum agricultural land (246.97 acres), which is 56.19% of the total agricultural land of the Paurashava. There is no agricultural land found in Ward No. 2.

Education

Land that used for Colleges, High School, Primary School, NGO School and Madrasa are considered in this section. 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 highest in Ward 3 (36.10%).

Government Services

Paurashava Office,Kumarkhali Paurashava office, UNO office, Food office, Sub-Register office, Upazila Primary and Secondary Education office, Water Development Board, Rural Development Board and other government offices are included in this category of land use. Mostly this type of land use is found in Ward 6 (73.92%) then comes Ward 1 (12.86%).

Map 3-2: Existing Landuse of KumarkhaliPaurashava

Circulation Network

In circulation category mainly lands used for providing all transport services including bus stoppage, waiting place, pumping station etc. along with lands used for roadway, waterway, railway and airways are included.

3.10 Paurashava Functional Linkage with the Regional and National network

National Network

Kumarkhali, the third longest Upazila of Kushtia zila. The Paurashava belongs to Khulna Division in the South-Western region of Bangladesh. An important highway namely Rajbari –KushtiaHighway passes through the Paurashava that maintain the communication system with Dhaka city and other districts of the country. The outer boundary of Kumarkhali Upazila is Pabna Sadar Upazila on the north, Shailkupa Upazila on the south, Khoksa & Pangsa on the east and Kushtia Sadar Upazila on the west.Several small and big industries and local crafts are contributing to the national economy and culture.

Regional Network

It is an important growth centre of this region. The major land use of the study area is residential. It is well connected with other region of Bangladesh by road. The Paurashava is connected with Jhenaidah, Kushtia upto Chuadanga and Rajbari upto Faridpur with road. There are many textile mills in this Paurashava. Garai river pass besides the Paurashava and the river is used as waterway transportation. Therefore, Kumarkhali Paurashava carries national importance. The Paurashava produces sugarcane, betel nut and coconut which have been supplied to entire country. It attracted huge in-migration by people. There is increasing growth rate and migration.

3.11 Role of Agencies for Different Sectoral Activities

Agencies responsible for utility facilities and municipal services are an important component for an area. Utility services include water supply, gas supply, electric supply, sewerage and drainage system, telecommunication system, fire services, solid waste management, etc. The concerned departments / organizations responsible for planning and development of utility services are shown in the following table.

Table 3-7: Agencies responsible for sectoral activities

Sl. No.	Sectors	Responsible agencies
1.	Electricity Supply	Rural Electrification Board (REB)
2.	Water Supply	DPHE / Paurashava/ Private
3.	Telecommunication	BTCL / Mobile Phone Companies
4.	Sewerage and Sanitation	DPHE / Paurashava/ Private
5.	Solid Waste Disposal	Paurashava / Private
6.	Fire Service	Fire Services and Civil Defense
7.	Post office	Postal Department

Source: Physical Feature Survey, 2009.

The authorities (as presented in the Table-3.7) should perform other roles need to be carried out with the assistance and support of other relevant government agencies. Those roles are:

- Provide existing and future service areas with full complement of related services to ensure that they can function efficiently.
- Identify depressed areas in each of the Ward where no improvement is being made and provide services with ensuring benefits for the dwellers.
- Ensure that within specific time (may be project period or private sector involvement process and a guideline frame for them) services will be provided according to the demand of the Paurashava inhabitants.
- Identify the existing procedural and institutional constraints and resolve them with full cooperation of other responsible agencies.

Map 3-3: Regional/ National Road Network of Kumarkhali Paurashava

CHAPTER-4

CRITICAL PLANNING ISSUES

4.1 Transport

Van and rickshaw are two major transport modes in the study area. Motorcycle and Bicycle is the main mode for private users. Movement of motorcycle is also identified as major private mode. Inadequacy of bus service found normal scenario in the study area. The peak hour traffic movement is found in morning from 7am to 9 am and in the afternoon from 6 pm to 8 pm in general. Though overall traffic congestion is low, let it should not be increased. Establishment of bus route within the study area is another prior demand of the people.

From the physical feature survey, it is found that the hat / bazar in the study area is served by bituminous and brick soling roads. But the area is not served by well defined road hierarchy, nor is required now due to sparse use of roads by motorized vehicles. However, the induced activities due to the prospects of upward economic change may need to provide road network befitting with the need.

Highway traffic is comparatively high and dominated by mixed type of vehicles including non-motorized. Generally, surface of the highways is moderate. The road network is not facilitated by designated parking area, bus terminal and bus bay. The core urban area of this Paurashava is very congested and the road with of this area is very narrow and existing road network developed in an unplanned way. As a result, sometimes congestions and chaotic situation occurs for a little while. In spite of this situation, present road network is functioning well. But it has to be upgraded to accommodate the future increase of volume of traffic that is expected to increase due to the growth of urban population.

4.2 Environment

In Kumarkhali Paurashava, noise pollution occurred by three wheelers and sound generates from saw mills and rice husking mills. Water contamination is observed as “Arsenic” threat. Air pollution is caused by dust emitted from saw mill, rice husking mills and furniture shops. Flood water and water logging creates health hazards. Dysentery and diarrhea diseases occur due to flood and water logging. Habitual inundations, especially in monsoon, due to external floods from canals are another threat to environment. Pragmatic planning / solution and Drainage Master Plan are very pertinent issues which is utmost importance in planning the Kumarkhali Paurashava .

However, implementation of activities like roads, drainage, bridge / culverts, housing and industrial establishments and bazars will radically change the natural topography and landuse pattern. The agricultural land will be converted into urban and semi-urban nature. Existing scenic beauty will disappear; water bodies will lost and general slope will

be diminished for earth filling due to urbanization. Therefore, in the process of preparation Structure Plan, Urban Area Plan and Ward Action Plan, consideration of those factors will be made for keeping the natural environment livable.

To create a better living environment, environmental phenomenon (as discussed earlier) has been considered with the systematic planning principles and regulatory measures. With these views, people's awareness needed to be increased through different public activities about the fair living environment. Arrangement of landuses should be provisioned for all the public and private organizations as their necessities.

4.3 Landuse Control

Accommodation of future thrust of growth due to the rapid growth of urban population and demand for supply of safe drinking water, providing safe and easy accessibility, use of agriculture production in income generating activities and create provision for further investment will increase.

The primary motive is to exercise control over unorganized development and promotion of planned infrastructure development to accommodate future urban growth. The Paurashava will be developed as a self-contained town in rural environs.

To increase the agro-product and use them in income generating activities, a vast agriculture land will be used and at the sametime, the existing agriculture land should be preserved. Further residential expansion should be controlled through the imposition of development control. In this context, concept of cluster development and compact township approach should be provisioned in the plan. Vertical development will be encouraged rather than horizontal to save the agriculture land.

Major aim of the Landuse Policy 2001 was to prevent indiscriminate conversion of agricultural land in to non-agricultural use, because such conversion may be threatened for food security of the country. Such conversion should be prohibited with the multi-sectoral use of land. During implementation of Urban Area Plan / Ward Action Plan, necessary control should be imposed according to the following manner.

- High value agriculture land should be preserved only for agriculture purposes. The land produces three crops in a year are under this category. Any physical development activities should be prohibited by the Paurashava authority. In the Paurashava, high value agriculture land is found in the Ward No. 1, 3 and 9.
- Drainage congestion due to the indiscriminate development activities is another critical issue. With the increase of population and commercial activities, lands of the Paurashava town are being converted for habitation. Natural development of those settlements somewhere creates drainage congestions. In the core urban area the existing roads are very narrow and there is a absence of drainage network. So, water logging is a common phenomenon in this area.
- Missing links in road transportation creates accessibility problem. In the intersections, lands are using by commercial activities including daily bazar and saw mill which are increasing traffic congestion.

- Easy accessibility with neighbouring Upazilas and a regional linkage is needed. Those linkages will grave huge amount of agriculture land. The single crop land may be used for this purpose.

4.4 Disaster

Disaster is the tragedy of a natural or man-made hazard that negatively affects society or environment. Disaster can be classified into two categories: natural disaster and man-made disaster. Natural disaster is the effect of flood, volcanic eruption, earthquake or landslide, draught, epidemic, etc. that affects environment and leads to financial, environmental or human losses. Man-made disasters is resulting from human intent, negligence or error, or involving a failure of a man-made system.

The Paurashava area including the KumarkhaliUpazila has affected by the several major natural disasters ranging from Cyclone, Flood to Water logging and Draughts, etc. The periods of those disasters are 1998, 2000, 2004, 2007 and 2008. Very scanty attempt has been made by the government to rehabilitate people after the natural disaster.

Urbanization is converting lands for residential use. Agricultural lands and water bodies are being chosen most frequently and the lands are being converted into urban settlement. In Kumarkhali Paurashava, wet lands are being filled up and agricultural lands are being converted. This has been identified as the major man-made disaster accelerating the degree of conversion year to year. Use of poisonous insecticides on the agricultural land is another man-made disaster which will affect in the long-run.

4.5 Laws and Regulations

The regulations prescribed (mentioned in the Chapter-5.2.1, Sl. No. 1 to 20) in the Local Government (Paurashava) Act, 2009 are not directly related with the physical development activities and their control. The Building Construction Act, 1952 is called the mother regulation to control all type of physical development but no instruction is being included in the “Local Government (Paurashava) Act 2009”. The Paurashava authority approves the building plan and excavation of tank without any regulatory control.

The regulation prescribed in the “Local Government (Paurashava) Act 2009”on the preparation of master plan is called traditional regulation. In the modern world, the concept of master plan became obsolete. In this project, the so called master plan, as mentioned in “Local Government (Paurashava) Act 2009”considered as a package and the plan included in this package named Structure Plan, Urban Area Plan and Ward Action Plan, though there is no regulation in the country on the preparation and implementation of those plans.

In the Paurashava about 33.78% land is under agriculture use. Most of those lands are private. Different type of help is necessary for the farmers involved with those agriculture lands. Section 13(1a) of the Agricultural Development Corporation Ordinance, 1961 prescribed regulation on the function of the Corporation and said that “the Corporation shall make suitable arrangements throughBangladesh, on a commercial basis, for the procurement, transport, storage and distribution to agriculturists of essential supplies

such as seed, fertilizers, plant protection equipment, pesticides and agricultural machinery and implements." Where the Corporation is absent, how the farmers will get benefit prescribed in the section 13(1a)? To increase the agricultural commodities such type of help is necessary.

Except the Paurashava Town (Township development areas), other areas are rural. To generate rural-based township environment, those rural areas should be preserved. Rural development components as prescribed in the section 7(1a) of the Bangladesh Rural Development Board Ordinance, 1982 should be provisioned to control those rural areas. As prescribed in the section 7(1a), functions of the Board shall be "to promote village-based primary co-operative societies and Thana Central Cooperative Association (TCCA) with a view to enabling them to be autonomous, self-managed and financially viable vehicles for increasing production, employment generation and rural development."

CHAPTER-5

PAURASHAVA DEVELOPMENT RELATED POLICIES, LAWS AND REGULATIONS

5.1 Indicative Prescription of Policy for Paurashava in the light of the Different Urban Policies, Laws, Regulations and Guidelines

The preparation of Structure Plan, Urban Area Plan and Ward Action Plan for the Kumarkhali Paurashava is highly depended on the policies and relevant contemporary rules and regulations prescribed by the government. In preparation of the above Plans, guidelines and strategies prescribed through the policies are considered carefully. Contemporary rules and regulations help to formulate the process and procedure for development control.

Urban Land Management Policy

It is necessary to impose control on the use and development of urban land. A range of urban planning tools including landuse planning, transportation planning and management, site planning, subdivision regulations and building regulations can be applied to minimize environmental impacts of urban development activities.

Policies

- Protect sensitive land resources by minimizing activities threatening environmentally sensitive areas.
- Manage hazard-prone lands through improvement of environmental management practices throughout the Paurashava.
- Conserve open space, as identified through a participatory planning process that will effectively preserve drainage system, provide greater opportunities for recreation and meet the minimum needs of aquifer recharge.
- Protect heritage structures and archaeological and cultural sites through appropriate schemes, projects and regulations.
- Control excessive urban sprawl and manage prime agricultural land through the implementation of regulatory reforms.
- Formulation of land information system, land market assessment regulations, efficient and transparent land record and registration system, etc.
- Increase the supply of land for the poor through reforming land transfer laws to counter trends towards land accumulation.
- Adoption of taxation policies that discourage speculative investments in land that is left undeveloped for extended periods of time.
- Implementation of land-banking and land-pooling programs that allow the government to increase its pool of land which can be exchanged for low-cost housing sites in the Paurashava;
- Undertaking land readjustment projects that include low-cost land and housing sites.

- Undertaking land-sharing schemes and tenancy reforms for establishing clear rights of tenants.
- Allocating khas land/acquired land for housing the poor.
- Allocating reasonable proportion of land in urban places for housing the poor.

Strategies

The strategies necessary to implement the policies of the urban land management is the use of planning tools in land management. Those planning tools may be structure planning, local planning and action planning. Second strategy is the landuse zoning. This tool may be used to:

- Protect productive agricultural lands by limiting the intrusion of non-agricultural uses;
- Manage floodplains by controlling uses of land within hydrologically defined areas subject to floods of a designated frequency;
- Preserve wetlands by limiting permissible uses to those that do not entail significant surface disturbance or runoff and substantially restricting land-disturbing uses within the areas identified as wetland areas;
- Restore and conserves natural canals and ponds.
- Facilitate planned unit development by allowing flexible design and clustering of residential development with higher densities on one portion of a land parcel so as to allow agricultural development or to provide increased open space or natural cover elsewhere on the parcel;
- Preserve open space by designating land areas for a variety of purposes such as recreation, future use, green belt, etc.

Strategies of land development for the Paurashava according to the Urban Land Management Policy may be followed through some techniques such as land pooling / readjustment, guided land development, land sharing, sites and services schemes, etc.

Landuse Policy

Bangladesh Landuse Policy was prepared and notified in the year 2001. Major aim of the policy is to prevent indiscriminate conversion of agricultural land in to non-agricultural use, because such conversion may be threatened for food security of the country. The expansion of residential, commercial, industrial and socio-economic uses will encourage the diminishing trend of agriculture land. Through the policy, government has encouraged Compact Township and vertical expansion of the different type of building rather than horizontal expansion.

Objectives

The objectives of the Landuse Policy are to:

- Prohibit the recent practice on conversion of agriculture land into non-agricultural use to ensure food security for the people.
- Impose zoning provision to control the better use of land according to the nature of land located in different regions.

- Rehabilitation of landless people on the alluvion lands alluviated from river, Haor or sea.
- Preserve khas land for future physical development activities.
- Confirm landuses in relation with the existing natural environment.
- Use of land in favour of job creation, landlessness and poverty alleviation.
- Control land pollution.
- Construction of multi-storied building with accommodation of various purposes in public and private sector for ensuring minimum land coverage.

About 46% land of the Kumarkhali Paurashava is under the agricultural practices. According to the Landuse Policy, those lands should be preserved as agriculture land. For such preservation, some guidelines prescribed in the Landuse Policy will be considered they are – in case of rehabilitation of the landless people, Khas land will be emphasized for distribution by the government.

Housing Policy

Housing, in the context of overall improvement of human settlements, is considered by the Government of Bangladesh as an integral part of culture and planning for economic development. The Global Strategy for Shelter by the year 2000 adopted by the United Nations in November, 1988 calls upon governments to take steps for formulating a National Housing Policy, 2004 in the light of "the enabling approach" for achieving the goals of the strategy.

The housing problem in the country is of serious magnitude. In addition to the large number of homeless households; the rapid growth of slums and unauthorized squatter settlement; the increasing cost of land and construction materials; rampant speculation and the phenomenal increase in house rent, the problem is compounded by non-availability of basic civic services, including water and sanitation to the bulk of the population and acute shortage of affordable and adequate shelter for the poor and vulnerable groups. The housing shortage was estimated in 1991 to be about 3.10 million units, composed of 2.15 million units in rural areas and 0.95 million units in urban areas; with the bulk of the backlog consisting of katcha un-serviced units. The housing shortage is likely to exceed 5 million units by the year 2000 A.D. The current housing stock is deteriorating fast due to aging, general neglect, poverty and civic apathy on the part of the dwellers.

Objectives

The objectives of the National Housing Policy are to:

- Make housing accessible to all strata of society and to accelerate housing production in urban and rural areas with major emphasis on needs of the low and middle-income groups, the high priority target groups will be the disadvantaged, the destitute and the shelterless poor.
- Make available suitably located land at affordable price for various target groups, especially the low and middle-income group.

- Develop effective strategies for reducing the need to seek shelter through formation of slums, unauthorized constructions, encroachments and shanty dwelling units and to improve the existing ones environmentally and, where possible, to relocate them in suitable places.
- Rehabilitate disaster affected households and houses affected by fire accidents.
- Mobilize resources for housing through personal savings and other financial input's and by developing suitable financial institutions.
- Make effective implementation of the housing programs, promote use of locally developed materials and construction techniques and increase production of forest-based building materials such as timber, bamboo or grass. Attempts will be made to develop alternative and durable materials based on locally available raw material.
- Develop institutional and legal framework to facilitate housing.
- Improve and enhance the character, quality and environment of the existing residential areas.
- Develop new strategies and undertake revision of the policy from time to time to cope with the emerging housing needs and problems in the country.
- Undertake action-oriented research in all aspects related to housing and foster minimization of cost and rent.

Rural Homestead

Clause 5.9 of the Housing Policy describes about the rural housing. The Kumarkhali Paurashava is rural based urban area. Rural character is the dominating issue in the housing sector. In the Housing Policy, following measures are suggested to improve rural housing:

- Avoiding unnecessary displacement of rural settlements due to development projects and where unavoidable, makes proper rehabilitation of the households, with full community involvement.
- Encroachment on agricultural land by proliferation of homestead should be discouraged. Efforts should be made for planned densification of rural homesteads. Subject to availability of khas lands, programmes similar to 'Adarsha Gram' programme of the Ministry of land will be undertaken in rural areas.
- The coordinated provision of water supply, sanitation, electricity, roads and other basic infrastructure services to existing and new habitations.
- Providing assistance by way of providing credit, dissemination of appropriate technology and delivery system for promoting housing.
- Initiating schemes for increased employment opportunities and income generation by extending appropriate credits and advice, so that housing affordability is enhanced.
- Establishing suitable institutional structure including strengthening of existing organizations at district and local level, with the responsibility for planning, financing, implementation, supervision and monitoring of rural housing schemes, and with the full involvement of beneficiaries, NGOs and CBOs, giving special attention to the needs of the poorest segments, specially women and disadvantaged persons.

- Linking the development of housing sites and the upgradation of rural housing with the activities under the Bangladesh Rural Development Board (BRDB) and other programmes for the creation of rural assets and employment.

Slums and Squatter Settlements

Clause 5.10 of the Housing Policy describes about the slums and squatter settlements.

The poor environmental condition in slums and squatter settlements create health problems for their residents and those in the adjoining areas. Those areas may be Paurashava Town. Keeping in view the policies of planned growth of urbanization, income support and poverty alleviation and together with steps to arrest the growth of new slums in urban areas, the Government would take steps to:

- Encourage in-situ upgradation, slum renovation and progressive housing development with conferment of occupancy rights, wherever feasible, and to undertake relocation of the squatter settlements from the sites that need to be cleared in public interest.
- Expand provision of water supply, sanitation and other basic services in slum and other settlements occupied by the poor.
- Ensure proper maintenance of amenities in slums and squatter settlements through community involvement and decentralized institutional arrangements.
- Integrate the provision of physical amenities slums and squatter settlements with basic services including maternal and child welfare services and health care, structured on community participation and involvement of voluntary agencies and management by local bodies.
- Provide night shelters and pay and use public toilet for the footpath dwellers and the homeless.

Infrastructure

Clause 5.2 of the Housing Policy describes about the infrastructures related with the housing. Most of those infrastructures are needful for housing construction and preparation of master plan. Following measures are recommended for development and improvement of infrastructure for housing:

- Increase investment by national and local government agencies in order to meet the rapidly growing needs of serviced land and to improve the availability of services in different settlements.
- Promote a balanced pattern of urbanization through a policy of decentralization of investments and incentives for the growth of secondary, intermediate and small towns so as to reduce pressure on metropolitan cities and to control unregulated conversion of agricultural and forest land for the purpose of housing.
- Develop economically buoyant and socially attractive secondary and intermediate towns by strengthening their linkages with contiguous rural areas and market centres as part of the integrated and planned development of the region and to reduce migration to the larger cities.

- Make necessary investments to increase within a reasonable time, the coverage of entire rural and urban population for potable water supply and basic sanitation.
- Increase investments in public transport and traffic network to improve mobility of people, particularly that of the poor.
- Encourage the use of infrastructure construction technologies, which are cost effective, incrementally upgradeable and environmentally appropriate.
- Provide government support for extension of infrastructure based on the participation of the people and private developers, NGOs, CBOs or on innovative systems of infrastructure leasing.
- Provide Government assistance to the local bodies for adequate cost recovery of investment on infrastructure, proper maintenance of services and upgradation of the capability of the personnel in local bodies and functional agencies.
- Provide opportunity for community participation and recognize people's initiative in the design, installation and the upkeep of services within the framework of the development programmes.

Strategies
The salient features of the housing strategy are:

- Housing will be given due priority in the national development plans treating it as a separate sector by itself.
- The role of the Government in housing will primarily be that of a facilitator or enabler in order to increase access to land, infrastructure, services and credit and to ensure availability of building materials at a reasonable price, specially for the low and middle-income groups and to create and promote housing finance institutions; whereas actual construction of housing will generally be left to the private sector developers, the people themselves, and the NGOs.
- Greater emphasis will be laid on affordability, personal savings, self-help and cost recovery. Efforts would be made to enhance affordability of the disadvantaged and low-income groups, through provision of credit for income generation and income enhancement, housing loans at especially low interest, access to space for running workshops or business and such other facilities.
- Improvements and rehabilitation of the existing housing stock will be given priority by the Government alongside new housing.
- Encroachments on public land and formation of unauthorized constructions will be discouraged.
- Austerity will be maintained in building houses and efforts will be made to economize housing costs, discourage extravagant construction, facilitate incremental house building and ensure wider application of low cost technology and optimum use of resources at the individual and national levels both in public and private sectors.
- Regeneration of forest-based building materials would be planned and environmental conservation given due consideration.
- Due attention would be given to construction, protection, replacement and rehabilitation of shelter in disaster affected and fire prone areas.

- Special care would be taken for the preservation of cultural heritage and promotion of vernacular architecture in new housing projects.
- Universities, research institutes and centres will be encouraged to conduct research on housing issues.
- The National Housing Policy will be co-ordinated with other development policies e.g. land, environment, population, employment, social welfare, fiscal and monetary policies at national and local levels.

Population Policy, 2004

Realizing the importance of population and development, the government prepared a Population Policy in the year 1976 and identified population problem as a national problem. Objectives of the Population Policy are to improve the status of family planning, maternal and child health including reproductive health services and to improve the living standard of the people making a desirable balance between population and development in the context of Millennium Development Goals (MDGs) and Interim Poverty Reduction Strategy (IPRS). Economic growth, poverty reduction and social development has identified as national strategy through the Population Policy of 1976. In the Policy, urgent attention should be given on the gender equity and empowerment, welfare services for elderly and poor, control on rural to urban migration, human resource development through skilled workforce and participation on NGOs and private sector in the process to control the population growth.

Aims

Aims of the Population Policy as presented are:

- Aware females about family planning to reduce Total Fertility Rate (TFR) and increase to use family planning devices among the fertile groups.
- Towards stable population within the year 2060 and the net growth rate not higher than 1% within the year 2010.
- Provide importance on mother's health to reduce maternal dead.
- To aware people about HIV / AIDS and to reduce it's chronological expansion.
- To help for providing gender equity and women empowerment in the society.
- To increase personal quality of the planners, administrators and service delivery agencies and to develop the information collection system, research and presentation.
- To control immigration from rural to urban and considers effective steps.
- Provisioning environmental sustainability including safe drinking water supply.

Agriculture Policy

Primary goal of the Agriculture Policy is to modernize and diversify the crop sector (including agricultural system) through initiation and implementation of a well-organized and well-coordinated Agriculture Development Plan. Overall objective of the Agriculture Policy is to make the nation self-sufficient in food increasing crop production (cereals also) and ensure a dependable food security system for all.

Aims

Clause 2 of the Agriculture Policy presents aims to increase crop production and maintain food security in the country. Some of those aims are:

- To increase income of the farmers and their buying capacity through stable and benefited agricultural development.
- To develop and preservation of productivity of the land.
- Removal of dependency on specific crop as a stable food.
- Introduces biological technologies, their use and expansion among the farmers.
- To encourage farmers for introducing irrigation from secondary sources during draught and introduces stable irrigation facilities for improving cropping intensity and crop production.
- Introduction of farming as an income generating sector through farming system and agro-forestry activities.
- To produce necessary agro-product for industrial use.
- To find out new opportunities for more export and minimum import of agriculture commodities.

Transportation Policy

For the country's economic and social development and for poverty alleviation, development of the road network is essential. For this reason the transport sector has been accepted as a priority sector. With the development of the economy the volume of vehicles, passengers and goods has been increasing. In the meantime a notification regarding classification, definition and responsible organizations for all roads was issued. In this context standardization and cost rationalization of the roads in the country, especially the Zila, Upazila, Union and village roads, have become very essential. For the development of Multimodal Transportation System (Road-Rail-River) such a standardization/ cost rationalization of roads and bridges / culverts is a need of the hour. Standardization including cost rationalization will provide the basis of appraisal of road / bridge projects leading to optimal development of the transport system as a whole. At present there is no standard design and national unit cost for construction and maintenance of various roads and bridges and culverts. As a result substantial cost difference has been proposed by the agencies for same type of road / bridges for the same area.

Summary of Issues Covered

Following tasks of a road projects will be adopted:

- The Committee reviewed the design standards for the Union, Upazila, Zila Roads, and concluded that the key design criteria for all roads should be traffic and axle loads, and not the classification of the roads.
- The six design standards agreed by the Committee to form a logical progression in terms of road width and pavement thickness, all based on traffic considerations. They are not directly related to road classification.
- The agreed design standards are to be used by all road agencies. Road agencies will be required to use appropriate standards for roads according to traffic criteria.

- Reconstruction- full pavement reconstruction on an existing embankment
- New road Construction - completely new embankment and road pavement, including bridges, culverts and any necessary slope protection. This is likely to prove a rare category of road project in Bangladesh
- Widening- road widening and upgrading, including full re-construction of the existing pavement
- Strengthening- removing existing road surfacing and providing a new base layer of Base Type-1 and surfacing.

A passenger car is 1.0 pcu. Larger vehicles have higher values. Conversion factors for vehicles to pcu's are shown in the following table.

Table 5-1: Passenger Car Unit (pcu) Conversion factors for non-urban roads

Vehicle Type	PCU factor	Vehicle Type	PCU factor
Car	1.0	Bicycle	0.3
Bus	3.0	Rickshaw	1.0
Truck	3.0	Motor Cycle	0.3
Autorickshaw	0.5	Tempo	1.0
		Bullock Cart	4.0

Source: Transport Research Laboratory (UK) Overseas Road Note 13.

Road design will henceforth be based on traffic criteria, as opposed to road classification, then in theory a road could take any of considerations mean that the typical applications of the designs will be as listed in the following table.

Table 5-2: Design applications

Roads class	Typical design applications
Zila	Types 5,4,3*
Upazila	Types 6,5,4*
Union	Types 8,7

** Special type to be used under special circumstances.*

The design lives, based on the pavement thicknesses for each existing design and each recommended design are set out in Table-5.3 in terms of the cumulative number of equivalent standard axles (ESA's). Given typical traffic levels and a growth rate of 5% per year the expected design life for each type of existing road is provided. For each of the recommended designs the forecast ESA's have been calculated from the traffic capacity in the design year, to allow the design life to be estimated. Again, traffic growth of 5% on all roads is assumed.

Table 5-3: Existing and Recommended design lives

Road Class	Existing Design			Recommended Design		
	Cumulative Million ESA's	Typical Expected Design Life (Years)	New Class	Design Type	Desiggn Life (Million ESA's)	Expected Design Life (years)
Rural Road/ union Road	0.5	10	Union	8	1.0	10
				7	1.0	10

Road Class	Existing Design			Recommended Design		
	Cumulative Million ESA's	Typical Expected Design Life (Years)	New Class	Design Type	Designn Life (Million ESA's)	Expected Design Life (years)
Feeder Road B/ Upazila Road	1.0	10	Upazila	6	1.0	10
				5	1.6	10
Feeder Road A/ Zila Road	1.0	10	Zila	4*	2.0	10
				5	1.6	10
				4	5.0	20
				3	6.5	20

*** Overlaying of 25-40mm BC will be required after every 7-8 yrs. * Special type to used under special circumstances.*

Environment Policy

Bangladesh National Environment Policy was approved and published in 1992. Key elements of the Policy are –

- Maintain ecological balance and overall physical development progress of the country through protection and development of different sectors. Protection from natural disaster is one of them.
- Identification and regulation all type of activities which pollutes and degrade the environment.
- Ensuring proper Environment Impact Assessment prior to undertaking of industrial and other development projects.
- Ensuring sustainable use of natural resources.

Proposed Sectors

For the fulfillment of every component of Environment Policy, it has divided in to 15 sectors. Those sectors are – Agriculture, Industry, Health, Energy, Water Development, Flood Control and Irrigation, Land, Forest including flora and fauna, Fish and Livestock, Food, Seashore and Maritime, Transport and Communication, Housing and Urbanization, Population, Literacy and awareness, Science, Technology and Research, Legal framework and Institutional framework.

Strategies

For the implementation of policies, a large number of strategies have been framed according to the sector. Some of those strategies are:

Agriculture: Conduct field survey for imposing sustainable farming system and increase soil fertility. Necessary steps should be taken based on that survey. Control on the use of chemical insecticides and pesticides and encourage farmers using bio-chemical fertilizer. Such strategy may be implemented by the Agriculture Ministry, Bangladesh Agriculture Research Council, Directorate of Agriculture Extension, Bangladesh Rice Research Institute, Jute Research Institute, Bangladesh Agriculture Research Institute, Bangladesh Sugar and Food Industries Corporation.

Industry: The industries identified by the Directorate of Environment in the group of polluting industries, measures should be taken against them as early as possible. The strategy should be imposed by the Agriculture Ministry, Directorate of Forest, Commerce

Ministry, Controller of Export Import, Plant Protection Wing, Directorate of Agriculture Extension, Bangladesh Sugar and Food Industries Corporation.

Health: Pure drinking water supply and sanitary latrine in urban and rural areas should be introduced. Industrial and agricultural wastes which are harmful for the health should not be dumped in the river, pond, canal and ditches. This should be controlled through the imposition of appropriate regulations. Those strategies will be maintained by the Local Government Division, Directorate of Public Health Engineering, Paurashava Authority and Directorate of Environment.

Water Development, Flood Control and Irrigation: For the expansion of the project on Water Development, Flood Control and Irrigation, environmental audit is necessary. Based on that audit, environmental degradation areas will be identified and appropriate measures will be undertaken. Roads and Highways Department, Bangladesh Road Transport Authority, Directorate of Environment, Water Development, Flood Control and Irrigation Ministry and Bangladesh Water Development Board will responsible for implementation of those strategies.

Land: Landuse regulations should be prepared and their effective use will be confirmed for planned use of land. Land Ministry, Agriculture Ministry, Industrial and other relevant Ministries, Local Government Division, Works Ministry, Directorate of Forest and Zila Parishad will responsible for such strategies.

Industrial Policy

At first, in the year 1999, government of Bangladesh has approved and notified the Industrial Policy. Again, in the year 2005, Industrial Policy of Bangladesh was published by the government. Both the Policies are synonyms and foremost objective is to setup planned industries considering the domestic demand, prospect of exporting goods and discouraging unplanned industrial growth in the light of past experience.

Objectives

Objective of the industrial policy is –

- To expand the production-base of the economy by accelerating the level of industrial investment.
- To promote the private sector to lead the growth of industrial production and investment.
- To focus the role of the government as a facilitator in creating an enabling environment for expanding private investment.
- To permit public undertaking only in those industrial activities where public sector involvement is essential to facilitate the growth of the private sector and / or where there are overriding social concerns to be accommodated.
- To attract foreign direct investment in both export and domestic market-oriented industries to make up for the deficient domestic investment resources and to acquire evolving technology and gain access to export markets.

- To ensure rapid growth of industrial employment by encouraging investment in labour intensive manufacturing industries including investment in efficient small and cottage industries.
- To generate female employment in higher skill categories through special emphasis on skill development.
- To raise industrial productivity and to move progressively to higher value added products through skill and technology up gradation.
- To enhance operational efficiency in all remaining public manufacturing enterprises through appropriate management restructuring and pursuit of market-oriented policies.
- To diversify and rapidly increase export of manufactures.

Strategies

All regulatory barriers will be removed within the quickest possible lime to facilitate easy and rapid flow of domestic private and foreign direct investment. Appropriate legal framework will be put in place to protect both investor and consumer rights to ensure proper market operation and consequently, for lowering cost of doing business.

- There will be no discrimination between domestic and foreign investment. Due emphasis will be given to promotion of regional and sub-regional cooperation.
- Existing public sector enterprises will be progressively privatized and public industrial investment will be limited to only those cases where there is special need to complement private investment or where there is an overriding social and national objective to be achieved.
- The capital market will be developed and strengthened to mobilize domestic savings and to attract foreign investment.
- Development of the infrastructure including port facilities, energy, transport and communication and human resource development will receive high priority Private investment including "Build, Operate and Own" (BOO) and "Build Operate and Transfer" (BOT) methods will be particularly encouraged in these sectors.
- Intensive industrial zones development will be undertaken together with balanced geographical dispersal of the zones in areas with growing potential to the utilization of local resources as more infrastructural and other facilities are put in place.
- Consistent with the charter of World Trade Organization (WTO), protection to domestic industries from external competition will be rationalized.
- To retain the competitive edge of domestic products, wage increases will he linked to productivity trends, and appropriate labour laws will be put in place to ensure congenial industrial relations.
- The industrial investment will be encouraged through tariff rationalization and (appropriate fiscal measures. The import and export policies will also be made supportive of and consistent with the Industrial Policy.

The Kumarkhali Paurashava is agro-based urban area. To reduce poverty and generate employment opportunities, more efforts are needed to establish agro-based industries in

the light of Industrial Policy, 2005. This effort will ensure protection and fair price of agro-products and employment opportunities for unemployed people. In order to create further employment opportunities beyond the agricultural sector, initiatives should be taken to setup small, medium and large industries across the country. A well organized linking among those industries in case of raw materials and supply of labour will be needed. If these types of industries setup in a planned way, unemployment rate will decline and poverty alleviation will be accelerated.

Health Policy

National Health Policy was approved and published by the government in the year 2000. Aim of the Health Policy is –

- To develop a system to ensure easy and availability of health services for the people living in urban and rural areas.
- To ensure optimum quality, acceptance and availability of primary health care including government medical services at the Upazila and Union level.
- To adopt satisfactory measures for ensuring improved maternal and child health at the Union level and install facilities for safe child delivery in each village.
- To improve overall reproductive health resources and services.
- To ensure the presence of full-time doctors, nurses and other officers / staffs, provide and maintain necessary equipment and supplies at each of the Upazila Health Complexes and Union Health and Family Welfare Centres.
- To formulate specific policies for medical colleges and private clinics, and to introduce appropriate laws and regulations for the control and management of such institutions including maintenance of service quality.
- To explore ways to make the family planning program more acceptable, easily available and effective among the extremely poor and low-income communities.
- To arrange special health services for mentally retarded, physical disabled and for elderly population.
- Strategies
- Some of the strategies of health policy are:
- The aim “health for all” will be implemented through awareness building strategies. Cost-effective procedures to deliver health services will be the prime consideration.
- A specific organization will perform responsibility for Epidemiological Surveillance to control the spread of epidemic dieses. Such concept will be included with different programs.

The services delivering by the health centers to the patient should be standard and a printed guideline on standard, monitoring and evaluation will be given to those health centers.

- A Health Services Reforms Body will be formed based on the Health and Population Sector Strategy. This Body will responsible for infrastructural reformation, employment, development planning and implementation of human resources relevant with the health activities and development of carrier of workforces.

National Urban Policy

National urban policy aims to strengthen the aspects of urbanization and at the same time effectively deal with its negative consequences in order to achieve sustainable urbanization. Diffusion of urbanization and rural-urban linkages is an important issue in this regard. There is need for decentralization of power from central to local government. The major objectives of national urban policy will aim to:

- Ensure regionally balanced urbanization through diffused development and hierarchically structured urban system.
- Facilitate economic development, employment generation, reduction of inequality and poverty eradication through appropriate regulatory frameworks and infrastructure provisions.
- Ensure optimum utilization of land resources and meet increased demand for housing and urban services through public-private partnerships.
- Protect, preserve and enhance urban environment, especially water bodies.
- Devolve authority at the local urban level and strengthen local governments through appropriate powers, resources and capabilities so that these can take effective responsibility for a wide range of planning, infrastructure provision, service delivery and regulatory functions.
- Involve all sectors of the community, in participatory decision-making and implementation processes.
- Ensure social justice and inclusion by measures designed to increase the security of poor people through their access to varied livelihood opportunities, secure tenure and basic affordable services.
- Take in to account, particular needs of women, men, children, youth, elderly and the disabled in developing policy responses and implementation.
- Assure health, safety and security of all citizens through multifaceted initiatives to reduce crime and violence.
- Protect, preserve and enhance the historical and cultural heritage of cities and enhance their aesthetic beauty.
- Develop and implement urban management strategies and governance arrangements for enhancing complementary roles of urban and rural areas in sustainable development.
- Ensure good governance by enhancing transparency and establishing accountability.

Rural Development Policy

From the year 1987 to 2011, government has framed and implemented different projects and programs for the betterment of rural people. Those projects and programs as mentioned in the Rural Development Policy of Bangladesh are:

- Food for Works Program(L¡-Sl ¢h¢ej-u M¡cÉ LjÑp§Q£)
- G.R Program (Gratuitous Relief Program)
- T.R Program (Test Relief Program)
- V.G.D Program (Vulnerable Group Development Program)

- V.G.F Program (Vulnerable Group Feeding Program)
- Single-House Single-Farm Program(HL¢V h¡s£ HL¢V M¡j¡l LjÑp§Q£)
- Back to home Program (O-l ®gl¡ LjÑp§ Q£)
- Food for Education Program(M¡-cÉl ¢h¢ej-u ¢nr¡ LjÑp§Q£)
- Rural Occupational Project(fõ£ S£¢hL¡ue fËLÒf)
- Poverty Reduction Project(c¡¢lâ ¢h-j¡Qe fËLÒf)
- Self-employment Program for Women(j¢qm¡-cl BaÈ-LjÑpwØq¡e fËLÒf)
- Women Empowerment Program(j¢qm¡-cl p¡j¡¢SL rja¡ue fËLÒf)
- Coordinated Women Development Program(pj¢eÄa j¢qm¡ Eæue fËLÒf)
- Peace Home Program(n¡¢¿¹ ¢eh¡p LjÑp§Q£)
- Shelter Support Program(BnËue LjÑp§Q£)
- Educational Allowance Program(¢nr¡ Efhª¢š L¡kÑH²j)
- Aged-allowance Program (huØLi¡a¡ L¡kÑH²j)
- Micro-credit Program(r¥âGZ LjÑp§Q£)
- Allowances for Widowed, Poor and Husband-renouncement Women Program(¢hdh¡, c¤xØq J ü¡j£ f¢laÉJ²¡ j¢qm¡-cl SeÉ i¡a¡ fËc¡e LjÑp§Q£)

Aims and objectives

Some of the aims and objectives of the Rural Development Policy is presented here.

- To increase the income and provision of jobs for the Villagers, especially for women and people under low-living standard in the rural areas.
- To confirm sustainable economic and social development through poverty reduction.
- To encourage self-employment opportunities in the rural areas.
- To emphasize for the development of rural wealth according to the equal distribution of economy and national development as prescribed in the Constitution of Bangladesh.
- To give confirmation to the rural people about infrastructural development, equal distribution of wealth and marketing of the agricultural production.
- To produce technologically efficient people about education, technical education and trainings in rural areas.
- Identification of demand and their fulfillment for socio-economic development of rural poor, persons involved with the production, especially small farmers and landless people.
- To reduce distances between towns and villages about services prevail through collective efforts and develop gradually.

Programs

Programs for the rural development may be framed on Involvement of people with the decision-making and development activities, Poverty reduction, Rural infrastructural development, Agro-based rural economy, Rural educational system, Village health service and development of foodstuffs, Village population control, Development of village

settlement, Landuse and development, Village industrial expansion, Increase of capital and financing, Women empowerment, Development of village child and youth, Development of village backward population, Area-based special development program, Self-employment for self-dependent, Cooperative system for rural development and Conservation of rural environment.

5.2 Laws and Regulations Related to -

5.2.1 Urban Development Control

For planned urban development the 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. The President of Bangladesh is empowered through the Constitution (called constitutional Wright) to establish, control and removal of any government office. This is a part of national administration. The President of Pakistan, in the year 1960 was enacted the Municipal Administration Ordinance, 1960. In the year 1977, some of the Municipalities were upgraded and re-named as Paurashava and administered through the Paurashava Ordinance, 1977. Again, in the year 2009, Paurashava Ordinance, 1977 is re-named as Local Government (Paurashava) Ordinance, 2009 but the name remains same.

The Local Government (Paurashava) Act, 2009 was enacted in 6th October 2009 and this is the only regulation executes by the Paurashava authority. The Paurashava authority may provide the functions as prescribed in the Ordinance, no provision is being outlined to control and manage those functions. The jurisdiction of this Ordinance on other regulations includes following Acts and Ordinances. The Paurashava may enforce those regulations according to their capacity.

- A¡¢bÑL fË¢aù¡e A¡Ce, 1993 (1993 p-el 27 ew A¡Ce)
- AbÑ GZ A¡c¡ma A¡Ce, 2003 (2003 p-el 8ew A¡Ce)
- ÙÛ¡e£u plL¡l L¢jne AdÉ¡-cn, 2008
- h¡wm¡-cn nËj A¡Ce, 2006 (2006 p-el 42 ew A¡Ce)
- Cantonments Act, 1924 (Act No. II of 1924)
- District Act, 1836 (Act No. I of 1836)
- The Penal Code, 1890 (Act No. XLV of 1890);
- Prevention of Corruption Act, 1947 (Act No. II of 1947)
- hÉ¡wL ®L¡Çf¡e£ A¡Ce, 1991 (1991 p-el 14 ew A¡Ce)
- The Bangladesh Shilpa Rin Sangstha Order, 1972 (P.O. No. 128 of 1972)
- The Bangladesh Shilpa Bank Order, 1972 (P.O. No. 129 of 1972)
- The Bangladesh House Building Finance Corporation Order, 1973 (P.O. No. 17 of 1973)
- The Bangladesh Krishi Bank Order, 1973 (P.O. No. 27 of 1973)

- The Investment Corporation of Bangladesh Ordinance, 1976 (Ordinance No. XL of 1976)
- The Rajshahi Krishi Unnayan Bank Ordinance, 1986 (Ordinance No. LV III of 1986)
- ®L¡Çf¡e£ A¡Ce, 1994 (1994 p-el 18 ew A¡Ce)
- Local Government (Paurashava) Act, 2009 (Ordinance No. XLXVIII of 2009)
- Local Government (Paurashava) Ordinance, 2009 (Ordinance No. XLXVIII of 2009)
- SeÈ J ja¤É ¢ehåe A¡Ce, 2004 (2004 p-el 29 ew A¡Ce) (see section 53(2)(Q)
- Evidence Act, 1872 (Act No. I of 1872) (see section 131)
- fö ®l¡N A¡Ce, 2005

On the other hand, the Paurashava is empowered for delivery urban services, collection of taxes and tolls, preparation of budget, control development and other physical activities provide health and social services and electoral role. All of those activities are guided through this Ordinance. In case of regulatory involvement, the Ordinance is wide enough than other authorities. The Ordinance proves that the Paurashava is independent and self regulatory body, but due to the absence of necessary manpower, technological support and government initiative in financial matter, the Paurashava is dependent on central government.

Building Construction Rules, 1996

Building Construction:The Paurashava Authority is the custodian and enforcement authority of the Building Construction Act, 1952 and Building Construction Rules, 1996 for any construction in the Paurashava premises. Section 3(1) of the Act presents control on building construction in the country. Mostly approval system of the building plan prescribed in the Rules and punishment for the breach of regulation presented in the Act. But the approval system is lengthy and volume of punishment is poor.

Density Control:Section 12(1) of Building Construction Rules, 1996 sets a formula for building height determination based on the width of the front road. This rule imposes a limit on the building height as long as the front road is less than 75 ft. (22.87 meter). Indirectly this limits the number of family or the size of population in a building. Setback rule of the building and approval system of the building plan also prescribed in the Building Construction Rules.

Excavation of Tank: Section 3(2) of the Act presents control on the excavation of Tank in the urban area. Approval for such excavation will be needed from the concerned authority. The regulation mostly enforces by the Development Authority and the Deputy Commissioner enforces on the areas other than the jurisdiction of Development Authority.

Raging of Hill:Section 3(3) of the Act presents regulation on the raging of hill. In the Act it is prescribed that anybody is not authorized for raging of hill without approval from the concerned authority. Development Authority and Deputy Commissioner is the concerned authority.

Playfield, Open space, Park, Natural Water Reservoir Conservation Act, 2000

Playfield, Open space, Park, Natural Water Reservoir Conservation Act, 2000 (Act No.XXXVI of 2000), enacted in 18th September 2000. In short, this Act may be called as National Reservoir Protection Act. The jurisdiction of this Act is covered Metropolitan City, Divisional and District level Cities and all urban areas including Paurashava area. Aim of the Act is to preserve play field, open space, park / garden and natural water reservoir. For the Paurashava premises, Paurashava Authority is empowered for enforcement of the said Act.

According to the section 5 of this Act, any area demarcated as Playfield, Open space, Garden and Natural Tank should not be changed with other use or it is prohibited for rent, leasing or any other procedure followed by, or handover to anybody for such changes. Again, according to the section 6, approval from concerned authority through application within stipulated time will be needed for any change of the area identified as play field, open space and natural tank. Punishment for such changes without approval from concerned authority is presented in the section 8. For such unlawful activities, punishment may be 5 years imprisonment or Tk 50,000 as a penalty or both. For preservation of natural water bodies in the Paurashava, this Act will be the important tool of the Paurashava authority.

Acquisition and Requisition of Immovable Property Ordinance, 1982

For any physical development activities, acquisition of land is needed primarily. In the Paurashava premises, for acquisition of land, the Paurashava Authority will request to the Deputy Commissioner to acquire the land needed. It is said in the section 3 of the Acquisition and Requisition of Immovable Property Ordinance, 1982, whenever it appears to the Deputy Commissioner that any property in any locality is needed or is likely to be needed for any public purpose or in the public interest, he shall cause a notice to be published at convenient places on or near the property in the prescribed form and manner stating that the property is proposed to be acquired.

Brick Burning (Control) Ordinance, 1989

Chairman of the Upazila Parishad is the enforcement authority of the Brick Burning (Control) Ordinance, 1989. In this Ordinance, control imposes only on the brick burning and said that no person should use wood for such purposes (section 5). For the violation of this regulation, the accused person may be punished with 6 months imprisonment or punished with a fine Tk. 10,000 or with both.

Conservation of Environment Act, 1995

Directorate of Environment is the enforcement authority of the Conservation of Environment Act, 1995. According to the Act, government can declare ecologically critical area through Gazette Notification (section 5(1). Such critical environment may be created through human activities or climatic disturbances. Control on motorized vehicles who exhausts smoke dangerous for human health has prescribed in the section 6. Punishment for violation of any order presented in the Act may be 5 years imprisonment or fine with Tk. 1, 00, 000 or with both.

Rural Electrification Board Ordinance, 1977

Government of Bangladesh has enacted the Rural Electrification Board Ordinance on 29th October 1977. Section 8 of the Ordinance has presented functions of the Board and among them two functions are -

(a) To establish electricity generation transmission, transformation and distribution systems in the rural areas of Bangladesh.

(b) To take measures for effective use of electricity to foster rural development with special emphasis on increase of use of electric power for economic pursuits such as development of agriculture and establishment of rural industries and assisting the advantaged sections of the community for augmenting their income and standard of living.

Public Health (Emergency Provisions) Ordinance, 1944

Department of Public Health Engineering is the enforcement authority of the Public Health (Emergency Provisions) Ordinance, 1944. The Department is responsible for supply of drinking water also in the Paurashava premises. According to the section 7(1), "a local authority may supply water to any local authority or to any other authority or person within or without its local area upon such terms as may be agreed, notwithstanding any provision prohibiting or restricting such supply contained in any other law." Based on such regulation, the Department is performing his duty in the Paurashavas.

Land Development for Private Housing Project Act, 2004

The Act was enacted on 1st March 2004 to control land under private housing and develop accordingly. The authority who has prepared master plan, the Act will be enforced on those areas. It is said in the section 1(2) of this Act that, this Act will be enforced under the jurisdiction of the master plan areas prepared under the guidance of The Town Improvement Act, 1953 and The Building Construction Act, 1952." According to the regulation prescribed above, the private housing construction in the Paurashava area may be controlled through this Act but, an amendment will be necessary to include the name of Paurashava Act, 2009 under which the Master Plan (Structure Plan, Urban Area Plan and Ward Action Plan) is being prepared.

5.2.2 Paurashava Development Management

After the independence (1971), all local government systems were abolished by the Presidential Order No. 7 in the year 1972 and appointed an administrator in each of the Municipality. After this Order, name of the Local Governments were changed as Town Panchayat instead of Union Committee, Shahar Committee instead of Town Committee and Paurashava instead of Municipal Committee. Shahar Committee was renamed as Paurashava in the year 1973 with a Presidential Order No. 22 and introduced election procedure for the Chairman and Vice-chairman. Thana Parishad Ordinance, 1976 (Ordinance No. XXXII of 1976) was enacted in 21st May 1976 to provide for the constitution of Thana Parishad. Paurashava Ordinance was enacted and notified in the year 1977. Nine Commissioner and selection of female Commissioner in every Paurashava was provisioned in the Ordinance. According to the Paurashava (amendment)

Ordinance, 1998, re-distribution of Paurashava Wards was introduced and the Paurashava belongs with 3 Wards proposed for 9 Wards and 12 Wards instead of 4 Wards. One Commissioner for every Ward and one-third Ward of every Paurashava was reserved for female Commissioner who was elected by the general election of the country. PaurashavaOrdinance, 2008 (Ordinance No. XVII of 2008) was provisioned, one Mayor, 9 Ward Councilors and 3 female Councilors for every Paurashava. Mayor and Councilors will be elected through general election. The provision remains in the Local Government (Paurashava) Act, 2009.

For the management of all physical development activities, a wide range of functions have been prescribed in the Second Schedule of the Act. For efficient management of development, three major activities are prescribed and they are – Town Planning, Building Construction and Development. According to the Second Schedule, functions in brief are presented in the following table.

Table 5-4: Functions in brief prescribed in the Local Government (Paurashava) Act, 2009

Major activity	**Specific functions**	**Functions in brief**
Town planning	Master plan	The Paurashava shall draw up a master plan for the city which shall provide for a survey of the Paurashava including its history, statistics, public services and other prescribed particulars. Development, expansion and improvement of any area within the city; and restrictions; regulation and prohibitions to be imposed with regard to the development of sites, and the erection and re-erection of buildings within the Paurashava.
	Site development schemes	Where a master plan has been drawn up and approved by the government, no owner of lands exceeding such area as may be specified in this behalf in the master plan, shall develop the site or errect a building or any plot of land covered by the provisions of a site development scheme sactioned to area in the prescribed manner. Among other matters, a site development scheme may provide for- (a) the division of the site into plots; (b) the street, drains and open spaces to be provided; (c) the land to be reserved for public purposes and to be transferred to the Paurashava; (d) the land to be aquired by the Paurashava; (e) the price of plots; (f) the works that shall be excuted at the costof the owner or owners of the site or sites; and (g) the period during which the area shall be developed.
	Execution of	If any area is developed or otherwise dealt with in

Major activity	**Specific functions**	**Functions in brief**
	Site Development Schemes	contravention of the provisions of the sanctioned Site Development Scheme, the Paurashava may by notice require the owner of such area or the person who has contravened the provisions to make such alteration in the site may be specified in the notice as where such alteration is not made or for any reason cannot be carried out, the Paurashava may, in the prescribed manner require and enforce the demolition of the offending structure; and notwithstanding anything to the country contained in any law, no compensation shall be payable for such demolition.
Building construction	Building construction and re-construction	Without approval of the building site and plan by the Paurashava, nobody can construct, re-construct any building in the Paurashava area. The Paurashava will approve the plan within sixty days or refund it within that specified time frame; otherwise the plan will be considered as approved.
	Completion of construction and change, etc.	After completion of the approved building, the owner will notify to the Paurashava within 15 days. The Paurashava may inspect the building and if found any violation of the provision prescribed in the Master Plan or in the Site Development Scheme, the Paurashava may demolish the building and the demolishing cost may be incurred from the building owner.
	Building control	If any building or anything fixed thereon, be deemed by the Paurashava to be in a ruinous state or likely to fall or in any way dangerous to any inhabitant of such building or any neighboring building or to any occupier thereof or to passers-by, the Paurashava may be notice required the owner or occupier of such building to take such action in regard to the building as may be specified in the notice, and if there is default, the Paurashava may take the necessary steps itself and the cost incurred thereon by the Paurashava shall be deemed to be a tax levied on the owner or occupier of the building. If a building is in dangerous condition, or otherwise unfit for human habitation, the Paurashava may prohibit the occupation of such building till it has been suitable repaired to the satisfaction of the Paurashava.
Development	Development plans	The Paurashava shall prepare and implement development plans for specific time. Such Plans shall provide for- (a) the promotion, improvement and development of such function or functions of the Paurashava as may be specified;

Major activity	**Specific functions**	**Functions in brief**
		(b) the manner in which the plans shall be financed, executed, implemented and supervised; (c) the agency through which the plans shall be executed and implemented; and (d) such other matters as may be necessary.
	Community Development Projects	The Paurashava may, sponsor or promote community development projects for the Paurashava or any part thereof and may in this behalf perform such functions as may be prescribed.
	Commercial schemes	The Paurashava may, with the previous sanction of the Government, promote, administer, execute and implement schemes for undertaking any commercial or business enterprise.
Street	Public streets	The Paurashava shall provide and maintain such public street and other means of public commutation as may be necessary for the comfort and convenience of the inhabitants of the Paurashava and of the visitors thereto.
	Streets	No new street shall be laid out except with the previous sanction of the Paurashava. The Paurashava may by notice required that any street may be paved, matalled, drained, channeled, improved or lighted in such manner as may be specified in the notice, and in the event of default, the Paurashava may have the necessary work done through its agency, and the cost incurred thereon by the Paurashava shall be deemed to be a tax levied on the person concerned.
	General provisions about streets	The Paurashava may assign names to streets and paint the names or fix the nameplates on or at conspicuous places at or near the end corner or entrance of the street. No person shall destroy, deface or in any way injure any street, name or name plate, or without the previous permission of the Paurashava, remove the same.
	Street lighting	The Paurashava shall take such measures as may be necessary for the proper lighting of the public streets and other public places vesting in the Paurashava.
	Street watering	The Paurashava shall take such measures as may be necessary for the watering of public streets for the comfort and convenience of the public, and for this purpose, maintain such vehicles, staff and other apparatus necessary.
	Traffic control	The Paurashava shall make such arrangements for the control and regulation of traffic necessary to prevent danger and ensure the safety, convenience and comfort of the public.
	Public vehicles	No person shall keep or let for hire or drive or propel within the limits of the Paurashava any public vehicle

Major activity	**Specific functions**	**Functions in brief**
		other than a motor vehicle except under a license granted by the Paurashava, and in conformity with the conditions of such license. No horse or other animal shall be used for drawing a public vehicle within the limits of the Paurashava except under a license granted by the Paurashava.
Water supply and drainage	Water supply	The Paurashava may provide supply of wholesome water sufficient for public and private purposes. Frame and execute water supply scheme for the construction and maintenance of such works for storage and distribution of water.
	Private sources of water supply	All private sources of water supply within the Paurashava shall be subject to control, regulation and inspection by the Paurashava. No new well, water pump or any other source of water for drinking purposes shall be dug, constructed or provided except with the sanction of the Paurashava.
	Drainage	The Paurashava shall provide an adequate system of public drains in the and all such drains shall be constructed, maintained, kept, cleared and emptied with due regard to the heal and convenience of the public. All private drains shall be subject to control, regulation and inspection by the Paurashava
	Drainage scheme	The Paurashava may prepare a drainage scheme in the prescribed manner of the construction of drains at public and private expense. The drainage scheme as approved by the government shall be executed and implemented within specified period.
	Bathing and washing place	The Paurashava may from time to time set a suitable place for use by the public for bathing, washing cloths, or for drying cloth. Specify the time at which and the sex of persons by whom such places may be used. No person shall establish, maintain or run a bath for public use except under a license granted by the Paurashava.
	Dhobi ghat and washer men	The Paurashava may provide dhobi ghats for the exercise of their calling by washer men, and may regulate the use of dhobi ghats and levy fees for their use.
	Public water-course	The Paurashava may declare any source of water, spring, river, tank, pond, or public stream, or any part thereof within the Paurashava, which is not private property, to be a public watercourse.
	Public ferries	The Paurashava may by by-laws provide for the licensing of boats and other vassals plying for hire in a public water-course to be a public ferry and may entrust the management thereof to the Paurashava, and there upon the Paurashava shall manage and

Major activity	Specific functions	Functions in brief
		operate the public ferry in such manner and levy such tolls as prescribed.
	Public fisheries	The Paurashava may declare any public watercourse as a public fishery, and there upon the right of fishing in such water course shall vest in the Paurashava which may exercise such right in such manner as may be prescribed.

5.3 Strength and Weaknesses of the Existing Policies

The Consultant has identified following weaknesses in the existing policies. These are – accommodation of future thrust of growth likely to arise after construction of the Padma Bridge at Dauladia point, supply of safe drinking water, providing safe and easy accessibility, use of agriculture production in income generating activities and create provision for further investment.

The primary motive is to exercise control over unorganized development and promotion of planned infrastructure development to accommodate future urban growth. The Paurashava will be developed as a self-contained town in rural environs.

Impact of construction of Padma Bridge at Dauladia point is extremely difficult to make a growth projection with sufficient precision. Many factors are involved with this such as landuse change, increase of commuters, increase of vehicular movement, forward linkage of commodities and social changes of the Paurashava dwellers.

To increase the agro-product and use them in income generating activities, a vast agriculture land will be used and at the sametime, the existing agriculture land should be preserved. Further residential expansion should be controlled through the imposition of development control. In this context, concept of cluster development and compact township approach should be provisioned in the plan. Vertical development will be encouraged rather than horizontal to save the agriculture land.

CHAPTER-6

PROJECTION OF FUTURE GROWTH BY 2031

6.1 Introduction

The Chapter presents future growth of the Paurashava according to the population, economy and landuse. The projected period for those components has been considered for the year 2010 to 2031. In case of population and landuse, projection has been presented but in case of economy, opportunities have been considered. For the Kumarkhali Paurashava, government policy is the prime focus as economic opportunity but that is not considered here. Existing local economic strength considers as the basis of economic opportunity. Agriculture, fish, livestock and poultry, local fruits and availability of labour force considers as a basic components of the economic opportunities.

6.2 Projection of Population

Indicators of development are directly or indirectly related to the size and structure of the population. Projections are based on the assumption that the past trends will continue to operate in the future. The reliability and usefulness of projections depend on the assumptions and their closeness to reality. Projections are conditional statements about the future and thus, when an element of judgment is added to the projections, it becomes a forecast. Forecasts enjoy the advantage of being based upon the assumption or a set of assumptions which are likely to be realized in the near future and can yield a relatively more realistic picture of the future. In general, population projections are treated as predictions and are never to be termed as final population. They should be reviewed frequently in order to determine the degree to which they agree with recent demographic changes. If the discrepancies between the projections and the ultimate events are significant, it should be found out whether it is due to the quality of input data or due to the methodology adopted.

Basis of Population Projection/ Method Used

All population projections are subject to some degree of uncertainty, because it is impossible to exactly predict future trends, particularly the future level of migration. Here is no exact of predicting the future population in a particular area, nor is there any way of determining the direction that the future development may follow.

There are various methods of projecting population (mathematical, economic and component methods). Some are very sophisticated and rigorous while others are simple and less sophisticated. Normally, population in future is governed by the following equation:

Pn = Po + Number of Births (B) - Number of Deaths (D) + Net Migration (Nm)

For the projection of population, base year population (Po) in 2001, the number of births and deaths between 2001 and 2011 and net migration is required. Keeping in view that

though population in the base year (2001) is available but, in details of information like number of births, deaths and migration is not available for Paurashava level population projection. In-migration and out-migration, net migration may be either positive or negative to be projected which is not possible.

Therefore, the module discusses simple and easy-to-handle methods of population projections given the purpose. A slightly improved method is the compound rate of growth method, which can be computed with the help of the following formula.

R = [(Pn / Po) 1/n - 1] x 100 ---------- (i)

By the formula population in any requisite year can be projected using the following equation which is also known as Geometric Progression Method

Pn = Po (1+R/100) n---------- (ii)

Assumptions

The growth rate of Kumarkhali Paurashava is calculated based on the population data of 2001 & 2011, which is 1.07%.

Projected population by Mouza/ Ward

Following the equation, Geometric Progression Method (equation-ii) the projected population found for the year 2031 is 27097 which are 1.24 times higher than the present population (21914) of Kumarkhali Paurashava.

Ward wise Observed population for the year 2011 has been shown in Table 6.1.

Table 6-1: Ward wise Observed Population of the previous Decades of Kumarkhali Paurashava

Ward No.	Observed 2011		
	Male	Female	Total
1	1109	1196	2305
2	995	999	1994
3	998	1020	2018
4	855	911	1766
5	1233	1244	2477
6	1457	1446	2903
7	1430	1493	2923
8	1495	1518	3013
9	1252	1263	2515
Total	10824	11090	21914

Source: Community Series (Zilla: Kushtia), Bangladesh Population Census- 2011

Ward wise projected population of for the year 2021 and 2031 have been shown in Table 6.2.

Table 6-2: Ward wise Projected Population

Ward No.	Projected 2021			Projected 2031		
	Male	Female	Total	Male	Female	Total
1	1233	1330	2563	1371	1479	2850
2	1106	1111	2217	1230	1235	2466

Ward No.	Projected 2021			Projected 2031		
	Male	Female	Total	Male	Female	Total
3	1110	1134	2244	1234	1261	2495
4	951	1013	1964	1057	1126	2184
5	1371	1383	2754	1525	1538	3063
6	1620	1608	3228	1802	1788	3590
7	1590	1660	3250	1768	1846	3614
8	1662	1688	3350	1849	1877	3726
9	1392	1404	2797	1548	1562	3110
Total	12036	12332	24368	13384	13713	27097

Note: Population projection estimated from Community Series (Zilla: Kushtia), Bangladesh Population Census- 2011.

6.3 Identification of Future Economic Opportunities

The prospects relies with development of her infrastructure i.e. power supply, Gas supply, proper communication linkage etc. which is difficult to achieve (cash crop cultivation) if export oriented policy gets initiatives from govt. can be made. Same goes with intensification of fish, livestock, and fruit processing farms. Exports to abroad of these products like handlooms should be explored by government. Agro-related development like export oriented Cash crop production, Pisi-culture (Sweet Water Shrimp cultivation), Fruit Processing Plants; Forestry can bring more economic opportunity. For this, NGOs, Grameen Bank collaboration (social business concepts) with Paurashava can happen. Also, special mandates/ policy from Agriculture Ministry to turn Paurashava agriculture land as “Special Agriculture Zone” must be made.

There are enormous possibilities of development of this project area. The major prospects are:

- Through providing training to the fish-farmers and fishing entrepreneurs and other necessary institutional support mixed culture of fish and paddy, could be developed;
- Agro-based industries including food processing SMEs based on local raw materials has a good prospect to develop in the project area;
- As Rajbari to Kushtia Road has just passed through the Project area, it has great potentiality to develop as business area and area for other important trade and commercial activities;
- Kumarkhali is an important center of the Bangladesh Handloom Board. About one hundred automated textile manufacturing units are located here. The Upazila is rich in cottage industries especially in handloom, weaving and pottery.

6.4 Projection of Landuse

Rapid urbanization by gradual transformation of agricultural land to residential or commercial land use is evedent in Kumarkhali Paurashava. Business opportunities created by closer proximity of the Paurashava to Rajbari to Kushtia Road and existence of various urban facilities such as 9 health service facilities (e.g. clinic, health complex), 32 educational service facilities (e.g. school, college, madrasa) are the major accelerating the rate of urbanization in the Paurashava resulting land use changes in the Paurashava. Moreover, fertile agricultural land and well developed textile and ‘tat’ industry

contributed to enhanced socio economic condition of the inhabitants of the Paurashava which could be thought as an influencing factor for land use transformation in the Project area. Growth of Kumarkhali Paurashava over the years is mostly unplanned. Major ongoing development, mainly various types of construction activities of the Paurashava is along the Rajbari to Kushtia Road, which is creating most of the problems for .the planned growth of the town. Core areas (Ward Nos. 4, 5, 6 and 7) of the town along this Road and its close vicinity developed with diversified land use without any proper planning guidelines causing many difficulties such as, traffic congestion, drainage problems and environmental degradations etc. for the town. Various government and non-government institutions such as Paurashava office, commercial facilities such as main bazaar, education and health facilities situated at Ward Nos. 4, 5, 6 and 7 are acting as major 'pull factors' for in migration from the surrounding regions to the town and reasons for denser development in these Wards compared to other Wards of the Paurashava.

Connectivity with the arterial road system offers a great opportunity for the Paurashava to expand its trade and commerce. Fertile agricultural land and well developed textile and 'tat' industry are the major prospects for development of the area. Both capture and culture fishery has been identified as important features for the development in terms of employment and enhanced income of the inhabitants of the Paurashava. Existence of the River and quite a good number of water bodies in and around the Paurashava created opportunities for cultured fisheries in the Paurashava area. Good transportation linkage within the region and other parts of the country and potential for agriculture and fishery has created abundant scope for establishment of agrobased industries with adequate forward and backward linkages in the Paurashava.

An Overview on Projection of Future Land Uses

Kumarkhali Paurashava is gathering momentum in development as well as in population increase. At this stage it is not possible to predict the future land uses with certainty. However, it is useful to consider the trends of growth, demands of different land uses and projected population which might be continued over the next decade.

An overview of future land use projections for different types of land uses in Kumarkhali Paurashava have been discussed in the following sub-sections:

Basis for projection

Future projection of different types of land uses depend mainly on the projected future population of the town. Existing population of Kumarkhali Paurashava is 21914. The population as projected for the year 2031 would be 27097. Land use projections for different types of land depends on the requirements land for different residential, commercial, industrial, educational and service (including Govt. Non-Govt, service and community service) activities based on certain specific standards for each of the use-types.

Demand analysis

Within the the Paurashava area land devoted to different uses at present is not sufficient and not allocated following any established standard. Therefore, Team Leaders of all

packages and urban planners from Project Management Office (PMO) have prepared standard to be adopted in the current UTIDP project for the projection of future land uses for different categories of services within the Paurashava area. Adopting these standards future demand of different types of land–uses as shown in Table 6.3 has been calculated.

Table 6-3: Future Demand of Different Types Land Use

Types of Land Uses	Recommended Standard Provision	Estimated area (acre)	Estimated area (acre)	Estimated area (acre)
	(unit)	2011	2021	2031
Residential		219.14	243.68	270.97
General residential	100 –150 persons/1 acre	219.14	243.68	270.97
Real Estate – Public/Private	200 population/ 1 acre	-	-	-
Roads		10-15% of total area		
Paurashava primary roads	150 –100 feet			
Paurashava secondary roads	100 –60 feet			
Paurashava local roads	40 -20 feet			
Education		**36.79**	**40.33**	**44.28**
Nursery	0.5 acre/10,000 population	1.10	1.22	1.35
Primary School/ kindergarten	2.00 acres/5000 population	8.77	9.75	10.84
Secondary/High School	5.00 acres /20,000 population	5.48	6.09	6.77
College	10.00 acres/20,000 population	10.96	12.18	13.55
Vocational Training Centre	5 - 10 acres / Upazilla	5.00	5.00	5.00
Other	5.00 acres / 20,000 population	5.48	6.09	6.77
Open Space		**47.11**	**52.4**	**58.26**
Play field/ground	3.00 acres/20,000 population	3.29	3.66	4.06
Park	1.00 acre /1000 population	21.91	24.37	27.10
Neighborhood park	1.00 acre /1000 population	21.91	24.37	27.10
Recreation		**6.1**	**6.22**	**6.35**
Stadium/sports complex	5 –10 acres/Upazilla HQ	5.00	5.00	5.00
Cinema/ Theatre	1.0 acre /20,000 population	1.10	1.22	1.35
Health		**14.38**	**14.87**	**15.42**
Upazilla health complex/ hospital	10 -20 acres/Upazilla HQ	10.00	10.00	10.00
Health centre/Maternity clinic	1.00 acre/ 5,000 population	4.38	4.87	5.42

Types of Land Uses	Recommended Standard Provision	Estimated area (acre)	Estimated area (acre)	Estimated area (acre)
	(unit)	2011	2021	2031
Community Facilities		**13.5**	**14.1**	**14.76**
Mosque/Church/Temple	0.5 acre /20,000 population	0.55	0.61	0.68
Eidgah/	1.0 acre/20,000 population	1.10	1.22	1.35
Graveyard	1.00 acre /20,000 population	1.10	1.22	1.35
Community centre	1.00 acre /20,000 population	1.10	1.22	1.35
Police Station	3 – 5 acres/Upazilla HQ	5.00	5.00	5.00
Police Box/outpost	0.5 acre/ per box	3.00	3.00	3.00
Fire Station	1.00 acre/ 20,000 population	1.10	1.22	1.35
Post office	0.5 acre /20,000 population	0.55	0.61	0.68
Utility Facilities		**11.40**	**11.88**	**12.41**
Drianage	As per Requirement	-	**-**	**-**
Water supply	1.00 acre /20,000 population	1.10	1.22	1.35
Gas	1.00 acre /20,000 population	1.10	1.22	1.35
Solid waste disposal site	4 – 10 acres/Upazila HQ	7.00	7.00	7.00
Waste transfer station	0.25 acres/per waste transfer station	-	-	-
Electric sub-station	1.00 acre/20,000 population	1.10	1.22	1.35
Telephone exchange	0.5 acre/20,000 population	0.55	0.61	0.68
Fuel Station	0.5 acre/20,000 population	0.55	0.61	0.68
Slaughter House	As per requirement	-	11.88	-
Others	-	-		-
Commerce and Shopping		**24.1**	**26.81**	**29.81**
Wholesale market	1.0 acres/ 10000 population	2.19	2.44	2.71
Retail sale market	1.0 acres/ 1000 population	21.91	24.37	27.10
Corner shops	0.25 acre/per corner shop	-	-	-
neighborhood market	1.00 acre/per neighborhood market	-	-	-
Super Market	1.50 – 2.50 acres/per super market	-	-	-
Industry		**82.03**	**94.44**	**108.81**
small scale	1.50 acres /1000 population	49.16	57.89	68.16
cottage/agro-based	1.00 acres /1000	32.87	36.55	40.65

Types of Land Uses	Recommended Standard Provision	Estimated area (acre)	Estimated area (acre)	Estimated area (acre)
	(unit)	2011	2021	2031
	population			
Transportation		**2.75**	**3.05**	**3.38**
Bus terminal	1.0 acre /20,000 population	1.10	1.22	1.35
Truck terminal	0.50 acre /20,000 population	0.55	0.61	0.68
Launch/steamer terminal	1.00 acre /20,000 population	1.10	1.22	1.35
Railway station	4.00 acre / per Station	-	-	-
Baby taxi/tempo stand	0.25 acre /one baby taxi/tempo stand	-	-	-
Rickshaw/van stand	0.25 acre /one baby taxi/tempo stand	-	-	-
Passenger Shed	0.25 acre /one baby taxi/tempo stand	-	-	-
Administration		**30**	**30**	**30**
Upazilla complex	15.00 acres	15	15	15
Paurashava office	3 – 5 acres	5	5	5
Jail/Sub-Jail	10 acres/Upazilla HQ	10	10	10

Note: Planning standard from PMO and land use demand estimated from the projected population

Map 6-1: Population Density of the study area

6.5 Housing

Since a sizeable amount of Government Khas land is available in the Paurashava area and since density in some parts of the Paurashava ie. in the urban fringe Paurashava is considerably lower than the core planned housing development is still possible for both middle and low income people. Reasonable level of electricity supply within the Paurashava area, its connection with the national gas supply grid, increasing development of agro-based SMEs and thereby job opportunities, connectivity to both National and commercial capitals of the country show the prospects such development to take place. Housing projection for Kumarkhali Paurashava has been estimated and discussed in the following sub-sections.

Basis

Requirement of the dwelling units for projected population for the year 2031 had been the basis for calculating housing demand. Average Household size considered had been 4.1 since average family size of Paurashava area from Population Census is 4.1.

Demand Analysis

The formula used for calculating demand of the dwelling units is given below:

H=P/S

Where, H= Number of dwelling unit

P= the projected population

S= the projected average household size

Projected demand for dwelling units for the years 2011, 2021 and 2031 havebeen shown in Table 6.4.

Table 6-4: Year wise projected Housing Requirement for the Kumarkhali Paurashava

Ward No.	Observed, 2011	Projected,2021	Projected,2031
1	562	625	695
2	486	541	601
3	492	547	609
4	431	479	533
5	604	672	747
6	708	787	876
7	713	793	882
8	735	817	909
9	613	682	759
Total	5345	5943	6609

Note: Estimated from Community Series (Zilla: Kushtia), Bangladesh Population Census-2011

CHAPTER-7

LAND USE ZONING POLICIES AND DEVELOPMENT STRATEGIES

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

7.1 Zone of Structure Plan Area

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

7.1.1 Core Area

Total 97.55 acres of land, which covers6.61% of Structure Plan area, is declared as Core Area. It includes major potion of ward 1, ward 5 and ward 6. It is mainly the highest concentration of service area for an example paurashava, upazila complex, schools, post office, police station, bazar area etc. and it has the highest potentiality of development. Since these areas are forecasted to show density increase and increased demand and therefore will require regular upgrading. The main thrust to improve services should be in the unplanned zones, particularly where the deficiencies already are great and quality of life will sharply decline when the services also haveto cater for the additional population.

7.1.2 Fringe Area

A total of 482.74 acres of land covering 32.69% of Structure Plan area is declared as Fringe Area. Maximum fringe area of proposed structure plan is located at Ward 1,2,3,5,7 and 8. This area mainly proposed, where a slow trend of urbanization is continuing in unplanned manner. The area is identified in the Structure Plan as the likely choice for new urban development beyond the core area. Ideally, it might be reasonable to provide primary infrastructure networks in this area to foster development encouraging a more rapid urbanization in a planned way.

Table 7-1: Structure Plan Policy Zoning

Zoning	Description of the Zone	Area (acre)	%
Core Area	This area is also known as built-up area. This is defined as the area which has the highest concentration of services; it also has the highest population concentration and density. It will absorb most population growth during the Land use Plan (2011-2021) period.	97.55	6.61
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	482.74	32.69

Zoning	Description of the Zone	Area (acre)	%
	supply of a full range of services as they will initially be underused. However, it is essential that planning and reservation of rights of way, at least for primary networks, be undertaken soon to enable provision when justified by increased density levels and allowed by resources.		
Peripheral Area	This is the zone where a slow trend of urbanization is continuing in unplanned manner. The area identified in the Structure Plan as the likely choice for new urban development beyond the core area. Ideally, it might be reasonable to provide primary infrastructure networks in this area to foster development and encouraged to enable a more rapid urbanization in a planned way.	102.12	6.91
New Urban Area	This zone will be the required additional area for future planned urban development as per population projection. New facilities and services like road, drains, footpath, waste transfer station and other civic services will be provided. This area is proposed to grow within 2031.	235.08	15.86
Agriculture	Agricultural land (also *agricultural area*) denotes the land suitable for agricultural production, both crops and livestock. It is one of the main resources in agriculture. The land under annual crops, such as cereals, other technical crops, potatoes, vegetables, and melons; also includes land left temporarily fallow; land under permanent crops (e.g., fruit plantations); areas for natural grasses and grazing of livestock.	213.64	14.43
Water body	Water body containing an area equals to or more than 0.25 acres excluding those of khal, irrigation canal and river will be treated as this category.	144.30	9.77
Circulation Network	It covers all the major roads within the structure plan areas.	201.95	13.74
Total		1476.87	100

Map 7-1: Structure Plan

7.1.3 Periferial Area

A small portion of land are within this category. A total of 102.12acres of area, which covers6.91% of Structure Plan area, is declared as Urban Peripheral Area which is located at the Ward no 6,8 and 9 in South-easttt and north-east corner of the Paurashava. This zone is developing areas that will take a longer time to reach the population densities of the urban core area. Low initial densities in these areas do not justify supply of a full range of services as they will initially be underused. However, it is essential that planning and reservation of rights of way, at least for primary networks, be undertaken soon to enable provision when justified by increased density levels and allowed by resources.

7.1.4 New Urban Area

Total 235.08 acres of land covering 15.86% of Structure Plan area is declared as New Urban Area. New urban area mainly proposed north-west corner of Ward no. 01, northern portion of Ward no. 08, vacant land between core area and urban fringe area. Most of the new urban lands will be use to meet the extra pressure of development trend for this reason. A large portion of land in Ward no. 09 will be used to establish industry and rest of the land will be used for future planned urban development as per population projection.

7.1.5 Agriculture

Total 213.64acres of land covering 14.43 % of Structure Plan area is declared as Agriculture Area. Northern portion of the Paurashava is mostly declared as agriculture area.

7.1.6 Waterbody

Total 144.30acres of land covering 9.77 % of Structure Plan area is declared as Agriculture Area. It includes ponds and ditches with an area equal to or more than 0.3 acres and river within the Paurashava.

7.1.7 Major Circulation Network

It contains Portion of Rajbari-Kushtia Highway passes over the paurashava area , road network with other neighboring urban centers and also includes the major road way network required for maintaining existing internal communication. Total 201.95acres of land which covers 13.74% of total structure plan area.

7.2 Strategies for optimum use of Urban Land Resources

7.2.1 Optimum use of Urban Land Resources

With a limited land mass, Bangladesh is the most densely populated country in the world. The land area of the country remains static amid continuously increasing population. Such a situation calls for strict regulation to utilize its scarce land resources for non-agricultural purposes. Increase in urban population means more demand for houses, roads, schools, hospitals, factories, bazars, shops, business centres, offices, other service facilities etc. Providing all these facilities require land and that is at the cost of valuable agricultural land, as the country has hardly any fallow land to accommodate all these land uses. Kumarkhali Paurashava is surrounded by valuable fertile agricultural land. Any

urban expansion will cost net deduction of agricultural land that will consequently affect local food and cash crop production. Practice of thriftiness on land utilization is, therefore, essentially needed in plans and development proposals. Such practice should start through adoption of conservative and rational standards of space use and their proper application in planning, designing and development.Table 8.2 shows the optimum use of urban land resources.

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

Policy	Justification	Means of Implementation	Implementing Agency
Policy UA/1: Optimization of Available Land Resources Growth within the established urban area is not compact inKumarkhali. There are still large amount of land lying vacant amid all categories of land uses within the Paurashava area and beyond. Infilling of these lands should be promoted and encouraged to optimize use of land.	Keeping large land areas vacant within the existing built up area, extension of physical boundary of the town is not logical. Such a tendency might cause valuable agricultural land out of use. There is a need to economize the use of land, which is a scarce resource against an expanding population in the country.	*Control:* Imposition of tax on the land remaining vacant for a long time can be tried to discourage peculation on the land use practices. Measures should be adopted to minimize the use of land by public sector agencies. Policies to discourage large scale land acquisition for development by the public sector can be tried. *Promotion*: The public sector should develop infrastructure facilities and services in deprived areas to enable the land owners for development.	-Kumarkhali Paurashava; -Ministry of Land
Policy UA/2: Utilisation of Khas Land for Urban Development	Khas lands are public land that should be made best use for community purpose. Instead of evicting people from their own land for implementing development proposals, khas land should be used as much as possible.	Taking over of khas land by Paurashava that falls under different development proposals under the current development plan. Paurashava can later on hand over the land to the concerned authority that will implement the particular development proposals.	-Kumarkhali Paurashava -Ministry of Land -DC, Dhaka

7.2.2 Plans for New Area Development

Table 8.3 shows policy to develop new urban area. It includes justification of new area development, means of implementation and agencies for implementation.

Table 7-3: Policy for new area development

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

7.2.3 Areas for Conservation and Protection

To ensure livable environment in the planning area, different areas are conserved in various forms, namely agricultural land, low land, pond and natural drainage, green belt, historic and heritage areas, etc. Details are given in Table 8.4.

Table 7-4: Area for conservation and protection

Type of Land	Means of Implementation	Implementing Agency
Loss of Productive Agricultural Land: The Master Plan area has a vast agricultural land in the northern side of this project. After implementation of the project, environment of agriculture will be converted into non-productive urban and semi-urban area.	The EIA Guidelines of DOE emphasized on the avoidance of productive agricultural land for any development project. Therefore, it will be wise to consider more economical use of land to avoid fertile lands. The town expansion and land acquisition should be based on the growth rate of population. According to population projection for the year 2031, the present residential land use area will grow with increasing density. So a large share of agricultural land can be spared at least for the time being.	-Kumarkhali Paurashava -DOE.
Low Land, Pond and DrainagePath: A total of 92 pond and ditches with an area equal to or more than 0.3 acres within the Paurashava are	This area is declared as water body in the Master Plan. As per the guideline of Wetland Conservation Act 2000, this area will be conserved as water	-Kumarkhali Paurashava

Type of Land	Means of Implementation	Implementing Agency
declared as retention area. In no way permission for filling up of these ponds should be given. Paurashava should acquire these ponds at suitable time to use them for retention and emergency use.	body. According to population projection for the year2031, the present residential land use area can be developed with increasing density up to this year. So a large share of water body can be spared.	-Water Development Board
Green Belt: The Bank of theGarai river is declared as green belt. This area will be used for aforestation and recreational purposes for conservation of environment and creation of opportunity for tourism development in this town.	This area is declared as green belt in the Master Plan.	-Kumarkhali Paurashava

7.3 Policies for Development

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

7.3.1 Policies for Socio-economic Sector

Population

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

Strategy:

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

Table 7-5: Policy for Population Sector

Policy	Executing Agency
<u>Popu/1:</u> Declaring population as one of the most critical sectors of national development Justification: Per capita national growth is being eaten up by constantly growing population. By controlling population, national benefits earned from economic growth can be shared in a better way, raising the level of	-Ministry of Planning -Ministry of Health and Family Planning

Policy	Executing Agency
living standard of the people.	
Popu/2: Putting more efforts and resources in raising the level of education. Justification: Education would not only create awareness among the masses about the benefits of small family size, it will also help secure better job with higher pay that would reduce poverty.	-Ministry of Education -Ministry of Planning -Ministry of Health and Family Planning
Popu/3: Creation of well paid and well trained grassroots level family planning workers for motivational work. Justification: Grassroots level workers can give door to door motivational services and distribute birth control materials in a better way. To get good services they must be efficient and well paid.	-Ministry of Planning -Ministry of Health and Family Planning

Economic Development and Employment Generation

Economic development of any place is associated with generation of employment. The generation of employment depends on the rate of investment in various sectors of an economy. An urban economy of any town starts building up with investment in the basic sector that leads to the building up of the non-basic sector. Investment in basic sector is very bright in Kumarkhalias it is very close to Dhaka City. Besides, it has good communication with other adjoining urban centers. However, the Paurashava must ensure that any foreseeable opportunity in economic development is given due attention for its own growth and economic benefits.

Strategy:

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

Table 7-6: Policy for Economic Development and Employment Generation

Policy	Executing Agency
Econ/1: Provision of bank loans on easy terms to attract prospective investors in the SME sector. Justification: Easy loans would encourage and attract prospective investors for investment in small scale industries.	-Ministry of Industries -Ministry of Commerce
Popu/2: Taking of measures to channelize remittance to value adding productive sectors. Justification: Larger amount of remittance is being diverted to land purchase, which is considered as the safest investment. This huge capital may be diverted to productive sectors to help create more employment.	-Ministry of Industries -Ministry of Commerce

Popul/3: Arranging entrepreneurship training programmes for prospective investors. Justification: There are many potential investors who are ignorant of the ways and means of investment and operation of an enterprise. The training can help them get educated in these lines.	-Ministry of Industries. -Ministry of Commerce.

Housing

Being very close to Dhaka city there is an extreme demand of housing for the commuter people. Housing policy and programmes are provided and executed by the national government. There is no local office of the National Housing Authority to execute housing programmes at Upazila level. As a local government, Paurashava can facilitate housing area development by means of providing road infrastructure, drainage, water supply, etc in designated housing zones. The consultant supports the prevailing national housing policy and advocates its execution at all levels, which at the moment is highly lacking.

No slums are observed in this small town, the way they are exposed in large cities. So no slum and squatter related problems are there in the town. This provides a better scope for planned housing development in the Paurashava.

Strategy:

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

Table 7-7: Housing and Slum Improvement

Policy	Executing Agency
Policy House/1: Provision of necessary services and facilities to promote housing at private sector. Justification: It is more difficult to provide housing on public sector initiatives, as it involves funding and land acquisition that takes a long time. By providing infrastructure and services, general people can be encouraged to build their own houses.	- National Housing Authority - Ministry of LGRD - Kumarkhali Paurashava
Policy House/2: Housing zone land owners can be involved in a participatory development approach, where Paurashava will provide infrastructure and the cost will be shared by land owners.	- National Housing Authority - Ministry of LGRD - Kumarkhali Paurashava

Social Amenities and Community Facilities

Social amenities and community facilities include, education facilities, health facilities, open space recreation facilities like, park and playground, amusement park and community centre. For comfortable and healthy urban living, these facilities are the fundamentals. Since these are social services, they must be provided by the public sector agencies as public good. For education and health facilities, the national government

haspolicies and there are separate ministries and their agencies to execute the policies through programmes and projects. There are also Upazila level offices of the concerned agencies to take care of the execution of national education and health policies and programmes. For providing amenities like, park and playground and community centre, the responsibility lies with the Paurashava. For park and playground, the Paurashava may secure local khas land. The open space recreation is difficult to provide as population expands and land price goes higher. Once time is lost, vacant lands are also lost. Amid soaring land price and absence of vacant land, it becomes extremely difficult to provide open space recreation. So, it is better to secure vacant lands for open space before density of population increases and land becomes scarce and pricier. For community center, intensive use of land should be made by making multiple use of the same space, for example, providing community center, ward councillor's office, clinic or any other use in the same building.

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

Table 7-8: Social Amenities and Community Facilities

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

7.3.2 Physical Infrastructure Sector

Transport

By far, transport is the most important means to revitalize an urban center. Intra and inter urban transportation facilities create economies of scale for prospective investors and enables easy and comfortable mobility of the residents. Easy and cheaper transportation of raw materials and finished goods create good investment climate for manufacturing enterprises that lead to development of the service sector firms. New employment generates and the non-basic sector expands leading to thriving urban center. To create transportation facilities, quality inter-Upazila and inter-District road network will have to be created that makes movement faster and easy. With good

transport infrastructure, economic development may become attractive. Besides, quality of local roads will have to be upgraded to encourage people live in the town. Once population starts increasing, it will expandlocal consumer market and will attract new investments in consumer goods production.

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

Table 7-9: Policy for Transport Sector

Policy	Executing Authority
Policy-Transport/1: Development of efficient inter-city road network with standard road. Justification: Increased inter-city mobility will increase business transactions and generate investment and employment.	- Roads and Highways Department (RHD)
Policy-Transport/2: Promotion of efficient road transport facilities between urban centers. Justification: Not only that communication is needed between urban centers, but to attract investment, emphasis must be laid on quality of roads built.	-Bangladesh Road Transport Authority (BRTA) -Dhaka District
Policy-Transport/3: Development of local road network through participatory approach. Justification: Development of roads will involve huge cost. Participatorydevelopment will enable cost sharing, which will reduce cost of road construction substantially.	- Kumarkhali Paurashava - Local Government Engineering Department (LGED)
Policy-Transport/4: Development of river based transport system. Justification: Develop river based transport system will increase easy and chippest water transport.	- Kumarkhali Paurashava - BIWTA

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

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

Table 7-10: Policy for Utility Services

Policy	Executing Agency
Policy-Utility/1: Exploration of alternative sources of water to ensure sustainable supply. Justification: Amid constant rise of urban population, it is time to explore alternative sources of water like, rain water harvesting and surface water supply.	- LGED - Kumarkhali Paurashava
Policy-Utility/2: Involvement of beneficiaries in solid waste management. Justification: Involvement of beneficiaries in solid wastemanagement will make the operation more effective and reducefinancial responsibility of the Paurashava.	- Kumarkhali Paurashava , - NGOs and CBOs
Policy-Utility/3: Exploring re-use and recycling of waste materials to extract resources. Justification: Re-use and recycling of waste materials will produce resources and reduce cost of waste management.	- Kumarkhali Paurashava , - NGOs and CBOs
Policy-Utility/4: Publicity on the benefits of hygienic sanitation to motivate people and enable people to have easy access to sanitary materials. Justification: Motivation will encourage people to adopt healthy sanitation and reduce health risks.	- LGED - Kumarkhali Paurashava - NGOs and CBOs
Policy-Utility/5: Protection of natural drainage system and preparation of hierarchical drainage network. Justification: Natural drainage systems are being grabbed and filled up, which increases the risk of water logging. Well planned hierarchical drainage network helps smooth drainage of storm and waste water.	- LGED - Kumarkhali Paurashava

7.3.3 Environmental Issues:

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

Natural Resources

The Paurashava is not endowed with many natural resources that can be conserved. Among the major natural resources that are available, 4 number of pondsand148 ditches and can be mentioned. As per **"Playfield, Open space, Park, Natural Water Reservoir Conservation Act, 2000"** guideline out of the total ponds and ditches with an area equal

to or more than 0.25 acres and the natural khals need to be protected and conserved to ensure sustainability in drainage and water supply of the Paurashava.

Strategy:
All khas land and canals should be vested with Paurashava for use in community interest.

Table 7-11: Policy for Natural Resources

Policy	Executing Agency
Policy-Nature /1: All khas lands within the Paurashava must be assessed and handed over to the Paurashava for use in community interest. Justification: This will prevent misuse of khas lands by political and powerful local people.	- Ministry of Land - Kumarkhali Paurashava
Policy-Nature/2: All natural canals within the Paurashava must be vested with the Paurashava for maintenance and proper use as drainage canal. Justification: This will help prevent unauthorized occupation and filling of natural drainage.	- Ministry of Land - Kumarkhali Paurashava - NGOs and CBOs

CHAPTER-8

IMPLEMENTATION ISSUES

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

8.1 Institutional Capacity Building of the Paurashava

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

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

It 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 Kumarkhali Paurashava for implementation. Paurashava will not only be the custodian of the plan, it will also directlyimplement much of the development projects. Besides, it will also be responsible for monitoring and implementation of the development projects by

other urban development and service giving agencies. This situation calls for strengthening of the existing capability of Paurashava.

8.1.1 Staffing and Training

As a traditional system of the Paurashava, engineer and secretary are appointed directly by the Ministry of Local Government and other staffs are appointed locally through the approval of the Ministry after the advertisement on the newspapers. The Paurashava is capable to collect the taxes and tolls prescribed by the government. But still they have lack of tax collection.There is no proper arrangement for staff training only few training are received by LGED which are not sufficient enough. 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.

8.1.2 Lack of Automation

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

8.1.3 Town Planning Capacity

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

8.1.3.1 Institutional Framework

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

Planning Division:

a) IT Section
b) Planning Section
c) Beautification and recreation Section

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

Figure 8-1: Scope of Work for Planning Division

TOWN PLANNING DIVISION

IT Section	Planning Section	Recreational Section
Activities of Information Technology Information and Technology Management. **Task to Execute Information and Technology Management** -Establishment of network system among all the divisions of the Pourashava . -Providing assistance and technical support (software and hardware support) for accounting, tax assessment, tax collection, preparing water supply bill etc. -Establishing, marinating and updating of Pourashava website. -Providing support for MIS. -Establishing GIS set up and database for practicing in Pourashava activities.	**Planning Functions** -Master Plan -Planning Development Projects -Land Development Projects -Building Control -Social Development Plan -Commercial Projects **Steps to execute the functions** **Master plan:** -Preparation of Master Plan,establishing legal basis of the Master Plan and execution of development control on the activities as per Master Plan-Review of Master Plan on aregular interval. -Controlling development projects in excess of land earmarked in the Master Plan. -Preparing and implementing phase-wise development projects, social development projects, commercial projects etc. -Undertaking development projects and controlling implementation of those projects in terms of transport network planning and drainage Master Plan and initiatiation of updating those projects on a regular basis each year. **Building Control** -Approval of design forconstruction/ reconstruction of buildings and collection of fees asper the rules. -Implementation of control systemrelated to inspection of buildingconstruction and completion andchange in building design.	**Functions Concerning Recreation** -Govt. wetland, govt. fishing grounds, pond and low lands; -Tree Plantation, Afforestation; -Park, Playground, open spaces; -Beautification (Landscaping) **Task to execute the works** **Water Bodies and Low Lands:** -Take initiatives to establish infrastructure and facilities for recreational purpose by using govt. wetland, fishing ground, pond and ditch within the Pourashava. -Hand over the responsibility to the appropriate private sector management and fix proper charge fee and ensure its collection which is require for maintaining and operational management of wetland facilities. **Landscaping** -Construction and maintaining aesthetic beautiful substance, sculpture, fountain etc in suitable place of the town which express the local heritage, art, culture, history and education. -Take beatification activities, implementation and maintenance of road side area, major intersection, open space, Pourashava office premise area, in front of important establishment and open space in front of different govt. organizations. -Initiate the activities for agreement with different private bank, insurance, mobile company and other different organizations for the beatification of the town. **Environmental Preservation, Park etc.** -Arrange tree plantation program each year within the Pourashava, afforestation, arrange tree exhibition and take initiatives and implementation for inspiration of tree plantation within Pourashava. -Take initiative and preserve park, playground and open space.

8.1.3.2 Lack of Paurashava Town Planning Capacity

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

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

Support forPlanned 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 Paura Bhaban.
- Citizen Report Card Survey by the Paurashava.
- Establishment of Grievance Redress Cell and make it functional with specific ToR
- Establishment of Mass Communication Cell (MCC) and make it functional
- Establishment of Urban Development Coordination Unit with inclusion of other departments for inclusive development

Urban Planning and Environmental Improvement

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

Urban Poverty Reduction

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

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

Income Generating Activities

The income generating activities include:

- Tax assessment software use and capacity development for staffs of assessment section.
- Continue reassessment activities regularly at 5 years interval.
- Continue interim assessment regularly in whole year.
- Introduction of computerized tax system and bill preparation.
- Increase collection by more than 5% annually (*up to 85% collection efficiency*).
- Increase non-tax own revenue source 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 Centre at Paurashava premises.
- Meet the Mass people of Paura-Parishad.

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

8.1.5 Good Governance in Legal Provisions

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

The Paurashava/Municipal Act/Ordinances prepared at different times since 1960's have iterated for the preparation of Master Plan by the Paurashava/Municipality for its planned development. So far urban local government Ordinances/Acts made in 1967, 1977, 2008 and 2009, all suggested for planned development. The Local Government (Paurashava)Act, 2009has made the provision of having a Master Plan prepared by a Paurashava within five years of its inception. The function of the Paurashava also includes that it ensures planned development following the rules of the Ordinance. But there is no provision for public participation in the Local Government (Paurashava)Act, 2009. In all these legal documents, people's role has been ignored which is the violation of the norms of good governance.

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

8.1.6 Financial Issues

Governance in Kumarkhali Paurashava

Financial governance refers to transparency and accountability of financial matters. All financial matters must be transparent to all. People must know about the policies and programs of the Paurashava, how much revenue is collected each year and the amount

of expenditure made on annual development. They must also be answerable to the people on how the public money is being spent and accounts being maintained.

The Ministry of LGRD and Cooperative has undertaken a number of projects in respect of establishing governance in upgrading Paurashava accounts system, like, UGIIP, STIFPP. Computer and accessories are supplied under these projects for automation of the accounts system. Besides, trainings are also offered to the Paurashava accounts staff for enabling introduction of automation in accounts system. But all these services have not yet reached Kumarkhali 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, Kumarkhali Paurashava will have to depend substantially on the government funding for implementing the development projects. But the government has limitations of its resources. In such a situation, if the Paurashava can not raise its own revenue adequately, it will not be able to execute much of the development projects under the Master Plan.

8.1.7 Monitoring, Evaluation and Updating

Monitoring and evaluation is a very important part of plan implementation. Monitoring helps check if the plan is being implemented properly. It also measures the level of implementation of the plan. If the plan implementation is not on track, corrective measures can be taken to put execution on the track. After expiry of any plan, evaluation is made about the errors and omissions. Such evaluation helps take corrective measures in the next plan. Such monitoring and evaluation must be carried out from within the Paurashava. But Kumarkhali Paurashava is not equipped with qualified manpower to make

such evaluation. Monitoring and evaluation of a plan is essentially, the responsibility of qualified and experienced planners. As there is no planner in the Paurashava, monitoring of plan implementation will be seriously affected. However, plan evaluation can be accomplished by means of out sourcing as and when it is required.

8.1.8 Periodic Review and Updating

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

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

8.2 Resource Mobilization

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

response to supply adequate fund. This situation calls for increasing revenue earning by generating new revenue sources.

8.3 Concluding Remarks

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

CHAPTER-9

URBAN AREA PLAN

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

9.1 Goals and Objectives of Urban Area Plan

Urban Area Plan is the first phase illustration of the Structure Plan intended to be implemented over a time span of 10 years. The Urban Area Plan has been prepared within the policy framework of the Structure Plan and aims to attain the overall project objectives. So there is a hierarchical relationship between the two. In fact, Urban Area Plan is the first phase detailed illustration of the policies and strategies of the structure plan.

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

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

9.2 Methodology and Approach to Planning

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

Urban Land Use Plan is aimed to guide the physical development of Kumarkhali town including its economic and social activities. This plan adheres to the policy directives

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

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

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

9.3 Delineation of Planning Areas

Delineation of planning area of the Paurashava has been decided with the assistance and advises received from Kumarkhali Paurashava Mayor, Councilors and other professional staffs. In order to delineate this boundary, there was a wide reconnaissance survey of the entire Paurashava area including those areas which have future potential growth. Though the Paurashava is one of the oldest Paurashava (established in 1869) in Bangladesh, it is still in rural character and population growth trend is very low, the development trend do not took much momentum as it required. The Paurashava composed of nine Wards where the adjoining areas are still rural in character; not having significant urban development trend. From physical feature survey data it is found that the present area of the Paurashava is 1301.39 acres. Around 174.48 acres of land has recommended for extension considering its potentiality of wiich 95.98 acre are in beween Paurashava and Rajbari-Kushtia Highway at north and 49.16 acre are in between Garai River and Paurashava area at south and another 30.53 acre area are for road extension and other purposes. Finally the structure plan stands 1476.87 acres of land. All the 9 wards of the Paurashava are covered by Structure Plan area. The area of structure plan should consider as planning area.

9.4 Content and Form of Urban Area Plan

The Urban Area Plan is presented in both map and textual format. The plan map is presented in 1:1980 or 1 inch to 165 feet scale, superimposed on latest cadastral/revenue map having plot boundaries within mouzas. The plan is accompanied by an explanatory report supported by necessary figures, maps and data. The report explains the various plan proposals and other components of the plan.

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

- Land Use Plan;
- Transportation and Traffic Management Plan;

- Drainage and Environmental Management Plan; and
- Proposals for Urban Services.

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.

The Landuse Plan is the first chapter of Part-B of this report. It 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.

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 part and environment part. 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. 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.

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.

CHAPTER-10

LANDUSE PLAN

The Landuse Plan is the first element of the KumarkhaliPaurashava Urban Area Plan. The Landuse Plan is being prepared for managing and promoting development over medium-term on the basis of the strategies set by the longer-term Structure Plan. Basically the Landuse Plan is an interpretation of the Urban Area Plan over the medium-term (10 years). The coverage of the Landuse Plan considers existing urban areas and their immediate surroundings with the purpose of providing development guidance in the areas where most of the urban development activities are expected to take place over the next 10 years. Delineation of the Landuse Plan area is based on the urban growth area identified as the Urban area Plan. It contains more details about specific programs and policies that require to be implemented over the medium-term.

10.1. Methodology and Approach

For the preparation of Landuse Plan, spatial information or 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.

Landuse map has prepared applying the appropriate systematic command through GIS. Landuse is transferred on CS Mouza map in a scale of RF 1:1980. Landuse is divided into different categories and subcategories approved by the LGED. Landuse colours and legend were also fixed by the PD (Project Director) of the UTIDP, LGED. Legend contains, necessary themes, features using different symbolize schemes. As per suggestion of the LGED for fixed legend and approved format for landuse, Consultants have prepared existing landuse map.

Based on the existing landuse map, the landuse plan is being 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.

10.2 Existing and Projected Landuse

10.2.1 Introduction

Details of landuse include structures and uses of land in multi-dimensions. Every individual structure and its details were surveyed during the survey period and find out the uses of land. Most of the landuse information was collected through physical feature survey. Later on, landuse map is prepared showing different use categories.

Connectivity with the arterial road system offers a great opportunity for the Paurashava to expand its trade and commerce. Fertile agricultural land and well developed textile and 'tat' industry are the major prospects for development of the area. Both capture and culture fishery has been identified as important features for the development in terms of employment and enhanced income of the inhabitants of the Paurashava. Existence of the River and quite a good number of water bodies in and around the Paurashava created opportunities for cultured fisheries in the Paurashava area. Good transportation linkage within the region and other parts of the country and potential for agriculture and fishery has created abundant scope for establishment of agrobased industries with adequate forward and backward linkages in the Paurashava.

10.2.2 Analysis and Projection on Existing and Proposed Landuses

The Paurashava is not an ideal township due to unplanned development. 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 will be controlled through the Compact Township Development concept with the encouragement of vertical development. In case of government services, specific building may accommodate different type of offices.

Future landuse has been calculated according to the development control for the masses and the standard supplied by the LGED. In case of public land, existing use and khas land have been emphasized. Willingness and participation of the people in development activities considers as a key factor for future landuse demarcation. Slow change of landuse emphasizes rather than rapid change. Let the people do whatever he likes on own land – such concept should not be considered for future projection of landuses. Three parts of the projection are landuse change, landuse control and landuse restriction is included in the Master Plan. In any case, river front areas should be restricted for human habitation. As a result, river water will safe from contamination.

There is 8842 nos. of structure in Kumarkhali Paurashava of which 84.92% are residential and 9.13% are commercial. So there is awide scope of new development. Due to the absence of airport and helipad, vertical expansion of the building will be easily encouraged in anywhere of the Paurashava. New innovation for increase the agriculture production may be encouraged easily. Business opportunities created by closer proximity of the Paurashava to Rajbari to Kushtia Road and existence of various urban facilities such as 9 health service facilities (e.g. clinic, health complex), 32 educational service facilities (e.g. school, college, madrasa) are the major accelerating the rate of urbanization in the Paurashava resulting land use changes in the Paurashava. Connectivity with the arterial road system offers a great opportunity for the Paurashava to expand its trade and commerce. Fertile agricultural land and well developed textile and 'tat' industry are the major prospects for development of the area.

The People of the Paurashava are not quite aware about the modern facilities available to their door step. It is easier to inject guiding principles, modern facilities and long run development control for the Paurashava as well as for the inhabitants.

10.2.3 An estimate on the Requirement of Land for Different Landuses

The Paurashava is not an ideal township due to the agriculture domination. Agriculture based township should be encouraged in the preparation of Master Plan. Growth of population is the natural trend and at the sametime, expansion of non-agricultural use on agriculture land is also natural tendency of the people. This will be controlled through the Compact Township concept with the encouragement of vertical development. In case of government services, specific building may accommodate different type of offices.

Future landuse have been calculated according to the development control for the masses and the standard supplied by the LGED. In case of public land, existing use and khas land may be emphasized. Willingness and participation of the people in development activities may be the key factor for future landuse demarcation. Slow change of landuse has emphasized rather than rapid change. Let the people do whatever he likes on own land – such concept should not be considered for future projection of landuses. Three parts of the projection are landuse change, landuse control and landuse restriction has been included in the Master Plan. In any case, river front areas should be restricted for human habitation. As a result, river water will safe from contamination.

Projection of landuse depends on the growth of population. After population projection it is found that, population of this Paurashava will be 24368 in the year 2021 and 27091 in the year 2031. Projection on landuse also depends on present trend of migration.

In case of landuse change, standard given by the LGED according to the projected population and area for the specific service is being calculated. Minimum use of agriculture land for physical development is emphasized in the plan. The vertical expansion will be emphasized rather than horizontal. In case of road network planning, missing links will get priority rather than new roads. For the development of pisciculture, most of the ponds and ditches may be preserved, in some exceptional cases; small number of ditches may be used for physical development activities. Landuse control and landuse restriction will be imposed by the Paurashava according to the prescribed plan.

The standards presented in the Table-1.1 are fairly generous and considered for the Paurashava (including extended areas). Adjustments have to be made in the core areas and a time line may be set to gradually achieve these standards over a five, ten and fifteen years period.

Commerce

In total, 26.25 acres commercial land is in the Paurashava.

Determination of Standard: According to the standard on Wholesale Market/bazar, 1 acre land is to be provided for every 10,000 populations and 1 acre land for every 1000 population for Retail sale market. Again, 0.25 acre of land is being standardized for per corner shop, 1 acre per neighbourhood market, 1.5 to 2.5 acre per super market and 1 acre per 25,000 populations for bank, hotel, garage and godown. The study team has considered 27097 populations for the study area up to the year 2031. For this population total number of required wholesale market/bazar stands at (27097/ 10,000), means 2.70 acres land is being needed up to the year 2031 and for retail sale market, 27.09 acres.

Recommendation / Forecast: In the planning area already has retail sale market including wholesale market/bazaar. The study team recommends a new wholesale market on earmarking land. Necessary planning permission and design criteria will be provided by the Paurashava. The lands may be allowed to use for other commercial purposes like bank, hotel and godown. No new area has proposed for commercial zone probable areas are earmarked as mixed use area so that they may use this land for residential/commercial purpose according to the demand.

Industry

In the Paurashava, 19.60 acres land is under industrial development.

Determination of Standard: According to the standard, land is being allocated as 1.5 acres for every 1000 populations in case of small-scale industry, 5 acres per 10000 populations for heavy industry and service industry and 1 acre per 1000 population for cottage/agro-based industry. The study team has estimated 27097 populations for the planning area up to the year 2031. For this population total required land for industry stands at (27097 / 1,000*1.5), means 68.16 acres land for small-scale industry and 40.65 acres for cottage / agro-based industry. Considering locational character (as agrobased area) no heavy industry has proposed for this area, up to the year 2031.

Recommendation / Forecast: The study team observed that all the industries are developed scatteredly. It is recommended to develop an industrial area at ward no 9 and along the west side of Rajbari-Kushtiahighway which recommend planned formation including grouping of industries on different locations. Necessary planning permission will be followed by the Paurashava. The lands, however, should not be allowed to use other than industry. The industries which are located dispersely should be accommodated within the prescribed industrial areas.

Map 10.1: Existing Landuse of Kumarkhali Paurashava

Map 10.2: Landuse Plan

Education and research

Primary School

Determination of Standard: According to the standard on primary school, 1 school with 2 acres of land is to be provided for every 5,000 population. The study team has estimated 27097 populations for the planning area up to the year 2031. For this population total number of required primary school stands at (27097 / 5,000), means 6 schools with 10 acres land will be needed up to the year 2031. The planning area already has 8 primary schools.

Recommendation / Forecast:According to the standard there is no need for new primary school but the existing area of school has proposed for extension. With increasing of enrollment, existing primary schools may be expanded vertically.

Secondary School

Determination of Standard:According to standard, 5 acres of land may be provided for every 20,000 population for one secondary school. The projected population of the planning area is 27097 up to the year 2031. Therefore, as per standard the planning area needs (27097/ 20,000) 2 secondary school with an area of 5 acres up to the year 2031. There are 4 secondary schools in the planning area. Number of schools already exceeds the requirement.

Forecast / Recommendation:As per above standard, no more secondary school is needed but the existing areas of the school may be expanded.

College / Higher Secondary School

Determination of Standard:The standard for college is 10 acres per 20000 populations. So there is a need of 2 colleges as per planning standard in 2031.

Recommendation / Forecast:The planning area already has two degree level college. So no additional college is needed for the planning area. But the planning team has proposed a collegiate high school considering the modern educatioanal facilities.

Vocational Training Centre

An important component for the rural masses is vocational training. Multi-dimensional training may be offered through the centre. People are being benefited directly and prepare him as a technical person enjoying training from vocational centre. At present, there is no vocational training centre in the Paurashava.

Determination of Standard:The prescribed standard for vocational training centre is 5 to 10 acres for Upazila.

Recommendation / Forecast:The study team recommends a vocational training for this Paurashava. The lands, however, should not be allowed to use other than vocational training centre.

Health Facilities

At present there is one Thana health complex and 8 private hospital/clinic in the Paurashava. The health facilities covered 7.50. acres of land.

Determination of Standard:The prescribed standard for health facilities are 10 to 15 acres for Upazila Hospital and 1 acre per 5000 population for Health centre/Maternity clinic. According to the standard, up to the year 2031, (27097 / 5000) means 5.42 acres of land will be needed for Health centre/Maternity clinic.

Recommendation / Forecast:The study team recommends an area for new health facilities where the land owners will develop such services. Necessary planning permission will be offered by the Paurashava. The lands, however, should not be allowed to use other than health services.

Open Space

At present there is 6.91acres of land under this category in the Paurashava.

Determination of Standard:The standard recommends 3 acres per 20000 populations for playground, 1 acre per 1000 population for park and 1 acre per 1000 population for Neighbourhood Park.

Recommendation / Forecast:The study team is not recommended play field. A central park cum stadium 4 neighborhood park are recommended with an area of 21.66 acres depending on availability of open land. Community forest and tourism development also prescribed without considering any standard. Amount of land for those components have been considered through discussion with the stakeholders.

Community Facilities

Community facilities include Community centre, Graveyard/Burial ground, Electric sub-station, Water supply pump, Post office, T&T office, Public library, Eidgah, Mosque/Church/Temple, Police station, Police box/outpost, Fire service station, Waste disposal site, club, etc. Existing land under community facilities is 5.65 acres.

Determination of Standard:The standard suggests 1 acre per 20000 for the community centre, Graveyard/ Burial ground and Eidgah. Again, 0.5 acre per 20,000 populations prescribed for Mosque/Church/Temple, Post office and T&T, 1 acre per 20,000 populations for Fire service station and 3–5 acres per Upazila Headquarters and police station.

Recommendation / Forecast:The study team recommends a new community centre in ward-6 with a area of 0.29acres. Areas for Mosque/Church/Temple, Post office, Fire service station and T&T remain with existing areas. The proposed total land under this category is 10.53 acres.

Administration

In the Paurashava, 15.11 acres land is under administrative use.

Determination of Standard: According to the standard for administrative land, 15 acres of land is to be provided for every Upazila, 3 to 5 acres per Paurashava office, 0.10 acres per Union and 10 acres for jail/sub-jail. Total required land for administration stands at 30 acres.

Recommendation / Forecast: The planning area already has one Upazila office, one Paurashava office and other govt. offices. Therefore, no recommendation for new

administrative area is prescribed but, vertical expansion of the existing administrative offices is required.

Residential

Existing residential areas of the Paurashava is 488.92 acres. All type of residential lands is included with such amount of land.

Determination of Standard:The standard recommends in Table-1.1 is 100-150 persons per acre. Again, it is recommended 200 persons per acre fore real estate or housing areas both for public and private. No standard is being recommended for low-income group.

Recommendation / Forecast:According to the standard (100 persons per acre), 243.68 acres land will be needed up to the year 2031. The consultant team assumed that within 2031 a major portion of land will be developed by the real estate developer. Considering 200 person/acre in planned residential area the exising residential land should meet the demand for future residential land.

Conservation and harvesting of rain water: Conservation and harvesting of rain water in Government Blocks, Commercial Buildings and Institutional Buildings. They should prove required facilities and infrastructure for conservation and harvesting of rain water available to them.

Following requirements are optional and should be provided in residences depending on site conditions and as per case to case basis.

Terrace Water Collection: The terrace shall be connected to a sump or well through filtering tank by PVC pipes. A valve system shall be incorporated to enable the first part of the rain water collected to be discharged to the soil if it is dirty and make arrangements to collect subsequent discharge.

Open Ground: Whenever there is open ground a portion of top soil should be removed and replaced with sand to allow percolation of rain water.

Table 10.1: Existing and proposed landuses including standard

Types of Land Uses	Recommended Standard Provision (unit)	Existing (acre)	Fuure Demand 2031 (acre)	Proposed Land (acre)	Percent (%)
Residential		**488.92**	**270.97**	**580.64**	**39.32**
General residential	*100-150 persons/1 acre*	-	270.97	513.77	
Real Estate-Public/Private	*200 population/1 acre*		-	66.87	
Roads		90.69	10-15% Of toal land	**202.95**	**13.74**
Paurashava primary roads	*150-100 feet*	-			
Paurashava secondary roads	*100-60 feet*	-			
Paurashava local roads	*40-20 feet*	-			
Education		**18.42**	**44.28**	**30.38**	**2.06**
Nursery	*0.50 acre/10,000 population*		1.35		
Primary School/	*2.00 acres/5000*		10.84		

Types of Land Uses	Recommended Standard Provision (unit)	Existing (acre)	Fuure Demand 2031 (acre)	Proposed Land (acre)	Percent (%)
kindergarten	*population*				
Secondary/High School	*5.00 acres/20,000 population*		6.77		
College	*10.00 acres/20,000 population*		13.55		
Vocational Training Centre	*5 - 10 acres/Upazila*		5.00		
Other	*5.00 acres/20,000 population*		6.77		
Open Space		**3.29**	**58.26**	**76.89**	**5.21**
Play field/ground	*3.00 acres/20,000 population*		4.06		
Park	*1.00 acre/1000 population*		27.10		
Neighborhood park	*1.00 acre/1000 population*		27.10		
Recreational		**3.62**	**6.35**	**0.11**	**0.01**
*Stadium/sports complex	*5-10 acres/Upazila HQ*		5.00		
Cinema/ Theatre	*1.00 acre/20,000 population*		1.35		
Health		**7.50**	**15.42**	**9.93**	**0.67**
Upazila health complex/ hospital	*10-20 acres/Upazila HQ*		10.00		
Health centre/Maternity clinic	*1.00 acre/5,000 population*		5.42		
Community Facilities		**5.65**	**14.76**	**15.39**	1.04
Mosque/Church/Temple	*0.50 acre /20,000 population*		0.68		
Eidgah	*1.00 acre/20,000 population*		1.35		
Graveyard	*1.00 acre/20,000 population*		1.35		
Community centre	*1.00 acre/20,000 population*		1.35		
Police Station	*3-5 acres/Upazila HQ*		5.00		
Police Box/outpost	*0.50 acre/per box*		3.00		
Fire Station	*1.00 acre/20,000 population*		1.35		
Post office	*0.50 acre/20,000 population*		0.68		
Utility Facilities		**not categorized**	**12.41**	**5.06**	**0.34**
Drianage	As per Requirement		**-**	-	
Water supply	1.00 acre /20,000 population		1.35	0.26	
Gas	1.00 acre /20,000 population		1.35	0	
Solid waste disposal site	4 – 10 acres/Upazila HQ		7.00	3.29	

Types of Land Uses	Recommended Standard Provision (unit)	Existing (acre)	Fuure Demand 2031 (acre)	Proposed Land (acre)	Percent (%)
Waste transfer station	0.25 acres/per waste transfer station		-	-	
Electric sub-station	1.00 acre/20,000 population		1.35	0	
Telephone exchange	0.5 acre/20,000 population		0.68	0	
Fuel Station	0.5 acre/20,000 population	0	0.68	0	
Slaughter House	As per requirement	-	-	0.25	
Others	-	-	-	1.26	
Commerce and Shopping		**28.25**	**29.81**	**34.83**	**2.36**
Wholesale market	*1.00 acre/10000 population*		2.71		
Retail sale market	*1.00 acre/1000 population*		27.10		
Corner shops	*0.25 acre/per Corner shop*		-		
Neighborhood market	*1.00 acre/per Neighborhood market*		-		
Super market	*1.50-2.50 acres/per Super market*		-		
Industry		**19.60**	**108.81**	**80.78**	**5.47**
Small scale	*1.50 acres/1000 population*		68.16		
Cottage/Agro-based	*1.00 acres/1000 population*		40.65		
Transportation		**0.66**	**3.38**	7.40	**0.50**
Bus terminal	*1.00 acre/20,000 population*		1.35		
Truck terminal	*0.50 acre/20,000 population*		0.68		
Launch/Steamer terminal	*1.00 acre/20,000 population*		1.35		
Baby Taxi/Tempo stand	*0.25 acre/one Baby Taxi/Tempo stand*		-		
Rickshaw/Van stand	*0.25 acre/one Rickshaw/Van stand*		-		
Passenger Shed	*0.25 acre/one Passenger Shed*		-		
Administration		**15.11**	**30.00**	**14.86**	**1.01**
Upazila complex	*10-15.00 acres*		15.00		
Paurashava office	*3-5 acres*		5.00		
Jail/Sub-Jail	*10 acres/Upazila HQ*		10.00		

** The area proposed for Stadium/sports complex combined with centralpark andcalculatedwithin the open space.*

10.3 Landuse Proposals

10.3.1 Introduction

Basically, landuse proposal involves with the existing conflicting landuses. Those conflicts may be raised due to different causes. Inhabitants of the Paurashava are not aware about the land level and slope direction of the Paurashava. Without knowing this information they are raising their land up to a mark and constructing permanent structure. As a result, water logging problem during rainy season is all over the residential areas.

Due to the absence of development control, the core area of the Paurashava is already developed as mixed-use area. Commercial, residential, administrative, educational uses are admixture in the core area. Zoning provision, landuse control should not be enforced in such type of the core area.

At present, the Paurashava is a natural developed area. Rearrangement of the existing use is not possible. Land acquisition for expansion of road (to increase the width of road) will create socio-political hazards. As a result, the roads in the core area remain same as today.

For water supply network, construction of sewerage facilities and removal of fire hazards, at least 24 feet width road is necessary. In the Paurashava, except National Highway, such type of road is absent. New road will form new township on agriculture land. These processes will washout agriculture domination from the Paurashava. Compact Township will be effective for new formation, not for the mixed-use areas where most of the roads are 8 to 10 feet width.

10.3.2 Designation of Future Landuse

- Identification and development of sites for government housing. After preparation and implementation of the master plan, different types of government activities will be increased. Residential accommodation will be needed for those government employees. A site for government housing should be reserved. National Housing Authority is appropriate for performing this responsibility.
- Encourage central government to decentralize industrial development from Dhaka. Those facilities may be relevant with specific agro-product such as jute for jute industry, cane and bamboo for handicrafts, poultry and horticulture farming, export-oriented vegetation, etc. Different authorities such as Agriculture Development Corporation, Small and Cottage Industries Corporation, Directorate of Livestock and Poultry may be the responsible authority.
- Provision of sites and services schemes for the low and lowest income groups. The Paurashava authority and Schedule Bank may be appropriate for performing these responsibilities. Housing for low-income group, distribution of khas land among the lowest-income group and loan with low-interest for house construction may be the appropriate schemes.
- Upgrading of slum and squatter settlements. Mostly, the vulnerable groups are affected by river erosion, form slum and squatters on public land. If possible, those formations should be upgraded providing basic utility services. It is better, in Paurashava context, the people are living in the slum and squatters, rehabilitate

them with the provisioning of housing for lowest-income group. The Paurashava and NGOs can perform such role.

- Location for new industrial development. The industrial area prescribed in the Landuse Plan will be developed provisioning all utility services. The authorities relevant with those utility services will perform the responsibilities. At first, the polluting industries (water and noise) from their original location should shift to the new location. Imposition of taxes, tax holiday and subsidized taxes may be imposed by the Paurashava for such rearrangement.
- Monitoring the principal aspects of community facility provision in the Paurashava. Wholesale or retail market, specialized clinic, etc. are under this community facility. When any difficulties will be encountered in case of suitable site selection considering demand of the inhabitants, the Paurashava will perform the lead role.

10.3.3 Landuse Zoning

Zoning is a classification of landuses that limits what activities can or cannot take place on a parcel of land by establishing a range of development options. Zoning has been defined as an action through legislation provided to a development authority / Paurashava to control a) heights to which buildings may be erected; b) the area of lots that must be left un-built upon; and c) the uses to which buildings may be constructed.

Area / Use Zoning

The objective of area zoning is to specify which types of landuse are considered appropriate for different areas or 'zones', and it therefore indicates the planning control objectives of the authority or municipality for its administrative area. The authority is obliged under the planning acts to designate in its development plan objectives for the use solely and primarily of particular areas for particular purposes.

According to the landuse table, area zoning is divided as agriculture, residential, commercial, industrial, administration and institutional. The zone has further segmented and detailed in the Ward Action Plan. A detailed scenario as plot-to-plot basis is also presented with the calculation of covered area in the landuse plan.

Density / Bulk Zoning

Aim of the density zoning is to provide an acceptable density which is related to the designed facilities and amenities especially for the residential areas. This will ensure a healthy community and enjoyable community life. In a particular area, how much number of buildings will be permitted and constructed, the decision is under the density zoning. Provisioning of setback rule and percent of land uses for different purposes is the prime consideration of density zoning. The proposed percentage mentioned in the landuse table is the only tool to control building density in the Paurashava.

Height Zoning

This 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.

For effective development control, in addition landuse zoning individual facility and the structures therein is complied certain regulations imposed to ensure desirable end. 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 among many other details, are controlled by Building Construction Rules, 1996. Besides, Bangladesh National Building Code focuses on the appropriate materials, construction method, building safety and associated issues. In absence of Paurashava Master Plan the above rules did not have scope for area specific rules and hence were common for the whole development process.

According to the Building Construction Rule, 1996, minimum permissible road width for obtaining plan permission is to shown, construction is allowed on plots connected by narrow roads provided the plot owner leaves formally half of the addition area needed to make the road 6m for widening the road to the permitted minimum. Perhaps the intension behind this was that gradually the whole road would rise up to 6m in short time and it is true for new areas. But congested unplanned area represents an alarming picture. In commercial area, most of the plots are occupied almost entirely by pucca structures covering the property line connected by the narrow pathways. Those owners did not bother for Paurashava's plan permission and a handful of those who obtained plan permission did not care to follow them. It is suggested that existing rules need to be modified to tackle the environmental problems created by illegal building construction.

10.3.4 Summary Showing Distribution of Land for Existing and Proposed Landuse

After a detailed consultation between the PMO and the consultants of the project, the land use classification for the Paurashava Master Plan has finalized. The followings are the finalized land use zone classification recommended by the PMO.The permitted use of land under different category of land has shown in the **Annex-1.**

- Urban Residential Zone
- Rural Settlement
- Commercial Zone
- Mixed Use Zone
- General Industrial Zone
- Government Office
- Education & Research Zone
- Agricultural Zone
- Waterbody
- Open Space
- Circulation Network
- Transportation Facilities
- Utility Services
- Health Services

- Community Facilities
- Urban Deferred
- Recreational Facilities
- Forest
- Beach
- Miscellaneous
- Heavy Industrial Zone
- Historical and Heritage Site
- Restricted Area
- Overlay Zone

First 16 land use zoning of the above list are available and proposed for Kumarkhali Paurashava Master Plan and the last 7 will not be applicable for Kumarkhali. In the sections below, the general definition of the use and description of associated permitted and conditionally permitted uses under each land use zone have been provided. The uses that are not listed here in any of the categories shall be treated as Restricted Usefor the corresponding land use category and shall not be permitted only except unanimously decided otherwise by the appropriate authority. In such situations the use shall get permission in the category of New Use.

Following is a short description recommended land use zones.

1) Urban Residential Zone

Urban residential zone refers to all categories of urban residential areas, including exiting ones and the residential land use proposed under the present master plan. This includes single family housing or multi-family residential. Zoning for residential use will permit some services. It will permit high density land use. In the year 2031, total population of the Paurashava will be 27097. If, standard of population considers 100 persons per acre total residential land will be needed 270.97acres. Existing residential area of the Paurashava is 488.92 acres. So, no additional land is needed up to the year 2031. But considering the development pattern a total of 580.64 acres of land has proposed under this category.

Table 10.2: Proposed new areas for residential development

Proposed Facilitiles	Ward Name	CS Mouza Name	Plot No.	Area in Acre
Residential				
Low Income Housing Area	Ward No. 06	Batikamara	501-511, 530-531, 534 part, 535-539, 1295-1300, 1303, 1304, 1526-1527, 1576-1586, 1823-1828, 1829 part, 1823-1838	13.122

Re-Settlement Residential Zone	Ward No. 05	Serkandi	1847-1850, 1852-1857, 1863, 1865	24.955
		Teparia	55	
	Extension Area-1			
Planned Residential Area-1	Ward No. 01	Uday Bishnupur	1-26, 53, 101-122, 124-126, 135, 144	22.441
Planned Residential Area-2	Ward No. 01	Uday Bishnupur	30-50, 54, 55-57	8.649
		Elangi	359-367	
Total				66.867

2) Rural Settlement

Rural settlement includes the low dense residential area which is scattered within Paurashava boundary and rural in nature. This use will have only low density uses and only up to double story building will be permitted aiming to control the growth in this zone. Less service and facilities will be provided. The zone of rural settlement is intended to provide locations, where rural settlement including agriculture can be set up and function. Without creating hazards and changes to surrounding land uses. A total of 6.11 acres of land under ward 9 has been proposed under this category.

3) Commercial Zone

The land used for commercial activities is considered as commercial land use. These activities include the buying and selling of goods and services in retail businesses, wholesale buying and selling, financial establishments, and wide variety of services that are broadly classified as "Business". Commercial land includes established markets and areas earmarked for markets. The commercial zone is intended to provide locations which can function without creating hazards to surrounding land uses. Existing commercial area of the Paurashava is 28.25 acres. If standard of area calculate according to the population for the year 2031, total 29.81 acres commercial land will be needed but in present situation pure commercial development may not possible that's way more mixed used land(residential-commercial land has proposed. A total 34.38 acres of land has proposed under this category including new area for whole sale maket Poura New Market and a Cattle Market.

Table 10.3: Proposed facilities for commercial development

Proposed Facilitiles	Ward Name	CS Mouza Name	Plot No.	Area in Acre
Commercial Facility				
Wholesale Market	Ward No. 08	Khayerchara	5, 6-7 part, 9 part, 17-18, 19 part, 43 part, 70-73 part, 74, 75-77 part, 84-85, 88, 89 part, 90, 91-92 part	4.494
Poura New Market	Ward No. 06	Serkandi	253-255, 256 part, 257-263	4.593
Cattle Market	Ward No.	Batikamara	2013 part, 2039 part, 204-2042	1.314

Proposed Facilitiles	Ward Name	CS Mouza Name	Plot No.	Area in Acre
	06			
Total				10.401

4) Mixed Use Zone

Mixed use zones have been recommended to allow some flexibility in development. In a small town like Kumarkhali, as the trend shows, an exclusive commercial land use is unlikely to function. Admixture of land uses will allow flexibility of development, instead of restricting development to any particular use. Existing land under this use is 3.49 acres. A total of such22.11 acres land has proposed underthis category. Mostly central area of the Paurashava is under mixed-use zone.

5) General Industrial Zone

General industries are the Green and Orange A categories of industries as per The Environment Conservation Rules, 1997. The general industrial zone is intended to provide locations, where general industrial establishments can be set up and function without creating hazards to surrounding land uses. In the Paurashava, industries occupied 19.60 acres land. For the year 2031 a total of 108.81 acres land should be provisioned according to the standard for industrial development. But considering the low potentiality for industial development total of 80.78 acres of land has proposed under his category including a proposed new industrial zone.

Table 10.4: Proposed newindustrial area development

Proposed Facilitiles	Ward Name	CS Mouza Name	Plot No.	Area in Acre
Industrial				
General Industrial Zone	Ward No. 09	Khayerchara	143, 144 part, 145-215, 218, 286-309, 324-326, 444-448, 470, 506-511, 513-570	54.320
	Extension Area 03			7.704
Total				62.024

6) Government Office

Government Office zone covers all kinds of government offices including existing and proposed (e.g. proposed neighbourhood center) in the town. The existing government offices are Upazila Tahsil Office, Upazila Agriculture Office, Upazila Livestock Hospital, PDB Office, Police Station, Post Office, Paurashava Office, Sub-registry Office, T & T Office and Upazila Parisad Office. Existing land under this use is 15.11 acres. For the year 2031, 30.00 acres land will be needed. The administration includes Paurashava office, Police station, Jail/sub-jail, Tahsil office and other utility offices. The standard prescribed for Upazila Complex is 10-15 acres but the present area is 2.5 acres. Again, standard for

Paurashava Office is prescribed 3 to 5 acres. The planning team has proposed that the existing land under this category will remain same.

7) Education & Research Zone

Educational & Research zone refers to mainly education & research and other social service facilities as listed in **Table-A.13, ANNEXURE-2,** and conditional uses as listed in **Table-A.14, ANNEX-A**. Mostly educational institutes such as primary school/kindergarten, secondary school, college and vocational training institute are in this group. Existing land under this use is 18.42 acre. For the year 2031, toal44.28acres land will be needed if standard considers for this purpose. Due to scarcity of land vertical expansion of educational institution has recommended. Including a proposed Vocational Institute and a collegiate school total of 30.38 acres of land has proposed under this category.

Table 10.5: Proposed new facilities for educational development

Proposed Facilitiles	Ward Name	CS Mouza Name	Plot No.	Area in Acre
Educational Institution				
Vocational Training Institution	Ward No. 07	Batikamara	4732, 4736, 4737 part,	3.129
		Khayerchara	25-26, 27-28 part	
	Ward No. 08	Batikamara	5054-5056 part	2.912
		Khayerchara	20-23, 24 part	
Pourashava Collegiate School	Ward No. 08	Batikamara	4457, 4460-4462 part, 4463, 4464 part, 4465, 4466-4467 part, 4468, 4469 part, 4470-4474, 4475 part, 4476-4478, 4737 part, 5054-5056 part	7.782
Total				13.823

8) Agricultural Zone

Agricultural land denotes the land suitable for agricultural production, both crops and livestock. It is one of the main resources in agriculture. It includes productive land (single, double and triple cropped), seed bed, fisheries, poultry farm, dairy farm, nursery, horticulture etc. The Paurashava has a vast area of agricultural land that demands formation of a separate zone like, agriculture zone. Agriculture zone is primarily meant for agriculture; land uses related to it and land uses that support it. Existing total area under agricultural use is 439.57 acres. After implementation of the Urban Area Plan up to the year 2031, it will be reduced. A total of 212.41acres of land has proposed under this category.

9) Waterbody

These will act as water retention areas which include ponds, water tanks, natural khals and irrigation canals. The plan suggests preserving most of these water bodies for two purposes, first, to serve as source of water, second to serve as water retention area during monsoon. The ponds with an area equal to or more than 0.3 acres will be preserved as the water retention ponds. In the Paurashava, total water body is 162.00 and up to the year 2031 it will be 143.38 acres.

10) Open Space

Open space includes play field/play ground, park, neighborhood park, community/reserve forest, tennis ground and open tourism components. At present, 3.29 acres land is under the open spaces. Up to the year 2031, 58.26 acres land under open spaces will be needed. A total of 77.89 acres of land has proposed under this category.

Table 10.6: proposed new facilities for open space development

Proposed Facilitiles	Ward Name	CS Mouza Name	Plot No.	Area in Acre
Open Spce				
Central Park	Ward No. 06	Batikamara	1255-1260, 1266, 1277-1279, 1282, 1286-1287, 1291-1293	3.17
Stadium	Ward No. 06	Batikamara	1311, 1312 part, 1318 part, 1320 part, 1399	5.00
Community Park-1	Ward No. 09	Agrakunda	215, 218-224, 225 part, 364	1.800
Community Park-2	Ward No. 07	Batikamara	4323	1.392
Community Park-3	Ward No. 03	Elangi	3321, 3323-3327 part	0.409
Community Park-4	Ward No. 05	Serkandi	1839-1841	1.710
Playground	Ward No. 09	Khayerchar	841, 844-862, 863 part, 871-872, 874 part	6.750
Poura Shisu Park	Ward No. 08	Batikamara	4429 part, 4436 part, 4459-4460 part, 5008-5017	4.685
Total				**24.481**

11) Recreation

Cinema / theatre and Stadium/sports complex are under the category of the recreation. At present, 3.62 acres land is under this category. He study team proposed the existing cinemahall will remain under this category with an area of 0.11 acres.The area proposed forStadium/sports complex combined with centralpark and calculated within the open space.

12) Circulation Network

Road network including primary, secondary, tertiary and local access road falls under this category. Following table shows the ward wise plot schedule for circulation network zone. In the Paurashava, 90.69(6.97%) acres land is under regional and local roads. More land will be needed for provisioning proposed roads up to the year 2031. About 10-15% of the total land may be considered for road network. A total of 201.95 acres (13.74%) of land has proposed under this category.

13) Transportation Facilities

Under transportation facilities, both transport and communication services are considered. This category includes, bus terminal/ stand, filling station, garage, passenger shed, ticket counter, transport office, etc. In the Paurashava, only 0.66 acres land is under

this use. For the year 2031, 3.38 acres land will be needed according to the standard. Transportation and Communication related services are Bus transport terminal, Railway station, Truck terminal, Rickshaw / Van / Auto stand, Launch/Boat ghat, Passenger shed, etc. Considering the real scenario with a proposed truk terminal and tempoo stand total of 7.80 acres of land has proposed under this category.

Table 10.7: proposed newtransportation facilities.

Proposed Facilitiles	Ward Name	CS Mouza Name	Plot No.	Area in Acre
Transportation				
Track Terminal & Loading & Unloading	Ward No. 07	Khayerchara	27 part, 51-55, 58-67	2.700
	Ward No. 08		24 part, 68-69, 71-72 part	3.720
Bus Terminal	Ward No. 06	Serkandi	112	0.43
Tempo Stand	Ward No. 01	Kumarkhali	256-257 part	0.377
Total				6.797

14) Utility Services

A number of utility establishments are required in a town to serve the people. Utility services include Overhead Tank, Power Office/Control Room, Public Toilet, Sewerage Office, Waste Disposal, Water Pump House, Water Reservoir, Water Treatment Plant, Waste transfer station etc. A dumping station, water sttation and a Slaughter house have proposed under this category with an area of4.37acre.

Table 10.8: proposed NewUtility Services

Proposed Facilitiles	Ward Name	CS Mouza Name	Plot No.	Area in Acre
Utility & service facility				
Dumping Site	Ward No. 09	Khayerchara	704-711, 712 part, 716-717	3.290
Public Toilet-1	Ward No. 08	Khayerchara	92 part, 93 part, 94 part	0.310
Public Toilet-2	Ward No. 06	Serkandi	112 part	0.112
Public Toilet-3	Ward No. 01	Kumarkhali	213	0.145
Water Pump Station	Ward No. 05	Serkandi	1774 part	0.257
Slaugther House	Ward No. 06	Batikamara	2013 part, 2038 part	0.254
Total				5.058

15) Health Services

The zone of health care facilities is intended to provide locations, where health facilities including upazila health complex and other maternity clinic can be set up and function. Existing land under this use 5.22acre. For the year 2031, 15.42 acres land will be needed if standard considers for this purpose of which 10 acre for Upazilla Health Complex and 5.42 acre for Health Center/Meternity Clinic .With a proposed hospital zone total of 9.93 acres of land has proposed under this category.

Table 10.9: proposed facilities for residential development

Proposed Facilitiles	Ward Name	CS Mouza Name	Plot No.	Area in Acre

Health Center	Ward No. 08	Batikamara	5018-5022, 5023 part, 5024-5031, 5036-5037, 5038-5039 part, 5040	4.71

16) Community Facilities

All community facilities, including funeral places (i.e. graveyards) and other religious uses denoted as community facilities. At present, 5.65 acres of land is under this category. There is no community center is in the Paurashava; planning team has proposed a community centre within the Paurashava building/office area, a central graveyard, nine ward centers and a slaughter house as community facilities in this area. One of the important philosophies of this plan is provisioning compact township development. Based on this concept, the Ward Councilor's Office building may be used including family planning clinic, Union Parishad Office and club. Land for such type of activities is not prescribed in the plan, land only allocated for Ward Councilor's Office building.A total of 15.39 acres of land has proposed under this category.

Table 10.10: proposed new community facilities.

Proposed Facilitiles	Ward Name	CS Mouza Name	Plot No.	Area in Acre
Community Facilities				
Community Center	Ward No. 06	Serkandi	307 part	0.289
Poura Central Mosque & Graveyard	Ward No. 06	Batikamara	1282-1285, 1289-1290 1330, 1519-1525, 1529-1530	5.426
Cremation	Ward No. 05	Serkandi	1407 part	0.460
Ward Center	Ward No. 01	Kumarkhali	225	0.154
	Ward No. 02	Elangi	514-515, 643 part, 647, 653-654	0.383
	Ward No. 03	Elangi	2870 part	0.153
	Ward No. 04	Kumarkhali	1100 part, 1101, 1102 part	0.144
	Ward No. 05	Serkandi	1622	0.151
	Ward No. 06	Serkandi	248 part, 249 part, 254 part	0.166
	Ward No. 07	Batikamara	3417-3418 part	0.171
	Ward No. 08	Batikamara	3965 part	0.222
	Ward No. 09	Tebaria	469 part, 471-472 part, 473, 491 part	0.187
Total				8.016

17) Urban Deferred

According to planning standard provided by LGED seeks about 10 percent of the total build up area. The total area under this use has been proposed as 33.63 acres of the

existing Paurashava area that include existing and proposed land uses.A portion of this zone may use for housing of the poor, disadvantages and refugee for climate change and other disasters to fulfil National Housing Policy, Disaster Policy and other policy prescriptions of the Government. The following are permitted Useswithin the Urban Deferred (UD) *Zone*:

- Agriculture, Livestock Based
- Agriculture, Vegetation Based (mushroom farms shall not be permitted)
- Existing facilities up to the date of gazette notification of the master plan. Condition is that, no further extension will be permitted.Table 10.2 proposed area for urban defferd.

Table 10.11: Proposed area for urban differed.

Proposed Facilitiles	Ward Name	CS Mouza Name	Plot No.	Area in Acre
Urban Deffard				
Urban Defferd	Ward No. 09	Khayerchara	222 part, 224, 227-228, 231-244, 246 part, 248 part, 251 part, 253-283, 317-325, 326-329 part, 330-334, 336-353, 365-366, 433-474, 448 part, 459 part, 460,	33.626

18) Overlay Zone

The overlay land uses refer to those uses that are not compatible to the surrounding land uses but, anyhow, they need to stay there and therefore will not be removed. These uses are only sites and not zones, actually. They have local, regional or national importance, though they don't conform to surrounding land uses. No other use except the use of overlay site is permitted in this zone. There is no scope for permitting or conditionally permitting the functions or uses as the zone itself is an overlay. The present and proposed use of the zone will continue until the next zoning regulation is imposed on those specific parcels of land.

There are a variety of overlay zones within the project area. Some of the important types of overlay sites are listed below including the purpose of retaining them are described below.

Environmental Protection Area

Environmental protection overlay areas refer to the areas that need to be preserved protected and manage for their natural resources. The purpose of this zone is to protect the areas of environmentally sensitive, areas critical to the ecosystems.

Graveyard Sites

The sites cover existing graveyards that imposes restriction on building or acquisition of such sites for their religious an emotional value.

Sports and Recreation Sites

Some existing open spaces, water bodies, etc. are delineated as overlay sites in order to protect them in consideration of their future need. These places are meant exclusively for sports and recreation.

Special Use Sites

There are some special use areas that need to be protected. Special and temporary events like, fair, hat etc. may be permitted in this zone. The purpose for delineating this zone is to preserve them and make them be able to render services to the present community and future generations.

Plot scheduling for development proposals of KumarkhaliPaurashava of different category of land useages are shown in the following table.

Table 10.12: Proposed landuse of the Kumarkhali Paurashava

Sl.No.	Landuse Type	Area (acre)	Area (Sq. Km)	%
1	Urban Residential Zone	580.64	2.35	39.32
2	Rural Settlement	6.11	0.02	0.41
3	Commercial Zone	34.83	0.14	2.36
4	Mixed Use Zone	22.11	0.09	1.50
5	General Industrial Zone	80.78	0.33	5.47
6	Governmental Services	14.86	0.06	1.01
7	Education and Research	30.38	0.12	2.06
8	Agriculture Zone	212.41	0.86	14.38
9	Water Body	143.38	0.58	9.71
10	Open Space	77.89	0.31	5.21
11	Recreational Facilities	0.11	0.00	0.01
12	Circulation Network	202.95	0.82	13.74
13	Transport & Communication	7.40	0.03	0.50
14	Utility Service	4.37	0.02	0.34
15	Health Services	9.93	0.04	0.67
16	Community Facilities	15.39	0.06	1.04
17	Urban Defferd	33.63	0.14	2.28
Total		1476.87	5.98	100.00

Source: Landuse Survey, 2009 and proposed by the Consultant.

10.4 Plan Implementation Strategy

10.4.1 Land Development Regulations to Implement the Landuse Plan

Effective implementation of a plan is the most important part of the planning process. The process of Implementation needs to be carried out with care and efficiency in order to produce best outcomes. This chapter highlights various measures needed to be taken in order to implement the landuse plan proposals.

Implementation of the Landuse 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 Landuse Plan and in fact any other form of development plans.

The factors that have been taken into account in deciding the priority include such things as – the importance of the issue that the policy addresses, its potential impact on the lives of the population, the ease with which it can be implemented, its urgency and its interdependence with other policies.

Prior to introduction of the regulations to implement the landuse plan, legislative involvement is recommended here.

1. 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 landuse component may be controlled with this Act.
2. Impose control on all type of buildings in the Paurashava according to the setback rule 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 landuse 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.
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).
2. 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.
3. 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.
4. 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.
5. 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.
6. The Paurashava will have to exercise strictly **"Playfield, Open space, Park, Natural Water Reservoir Conservation Act, 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.

7. 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 Paurashava 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.
8. 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.
9. 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.
10. 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. The Paurashava should raise its efforts on the imposition and realization of betterment fees to raise its income. In this case, East Bengal Betterment Fees Act, 1953 may be enforced.

10.4.2 Implementation, Monitoring and Evaluation of the Landuse Plan

Implementation through Multi-Sectoral Investment Programme: Major infrastructure development works such as primary roads, water supply, drainage, etc., will largely be controlled by Government. Public works requires efficient co-ordination through the Multi-Sectoral Investment Programme (MSIP).

Objective of a Multi-Sectoral Investment Programme (MSIP) will match a list of the development projects with the funding stream necessary to implement them. There are two basic activities that would determine the contents of MSIP. One activity would be to prioritize and schedule the investment projects of all public agencies so they will collectively help to achieve the development goals and objectives of the Landuse Plan. Second activity would be to analyze the source and availability of fund for the prioritized list of development projects.

Implementation through Action Plans and Projects: Action Plans and Projects will be the implementation plans to solve problems at the local level. Action plans will take a direct approach toward plan implementation with a minimum of research, reports or elaborate planning methods. These projects will be easily identifiable and will require minimum resource.

Implementation through Development Control: Landuse zoning is one of several methods of plan implementation to be considered. In all cases where some form of development, landuse control may be applied; careful consideration requires the following ideologies:

- the purpose to be achieved by the development controls;
- where controls should be applied;
- what aspect of development needs to be controlled;
- what type of development controls are required;
- what degree or level of development control is required;
- who will be affected by the required control;
- who will be affected by the controls and in what manner;
- when the controls should be applied;
- what will be the likely impact of the controls;
- how and by whom will the controls be administered and enforced.

Development control as an instrument of plan implementation may be selectively applied within the Landuse Plan. Development controls would also be varied in intensity and detail to suit the particular circumstances. It is important that they should be clear and easily understood by all parties concerned. Since the entire Paurashava Master Plan 'package' has become statutory, development controls associated with its component plans would also be statutory.

Implementation by Facilitating Private Investment: Another approach that would be taken by government toward plan implementation will be to guide and facilitate investments made by the private sector. Government can achieve this with relative ease and at very low cost by setting up a legal and operational framework, coupled with suitable incentives, to facilitate land consolidation, plot boundary readjustment, efficient lay out of plots and provision of local infrastructure by the private sector. The benefits of this approach would be:

- increased efficiently of the urban land market would make, more private land available to urban households;
- would pass much of the development costs for local infrastructure to the private sector and land market mechanisms;
- would increase in land for development without large cash outlays by government to purchase land for development schemes; and
- would keep provision of land for community facilities virtually no cost to government.

Plan Monitoring

The Landuse Plan would simply be tools for guiding and encouraging the growth and development of the Paurashava in a preferred manner. In a rapidly changing urban environment, the Landuse Plan would require to keep up to date. If this is not done, within a few years it will be obsolete. Therefore, it is imperative that the requirement for regular updating of the Landuse Plan be made a legal requirement.

For implementation of the various programme components of the Landuse Plan appropriate administrative measures will have to be undertaken. This will essentially include project preparation and monitoring of their execution and evaluation. For carrying out all these activities appropriate institutional measures are also be needed.

Evaluation

Monitoring and evaluation of on going and implemented projects is essential to keep the future course of action on the right track. An on going project should be regularly monitored and handicaps identified to enable taking appropriate measures at the right time.

Post implementation evaluation is also needed to take appropriate measures correcting past errors-from project preparation to implementation.

The top level supervision has to be done by a high level supervisory committee headed by Paurashava Mayor, LGED representative and Local Government Ministry. Other members of the committee will be local Ward Councilors, local community leader/social workers and the Town Planner of the Paurashava. The committee will supervise implementation works regularly and issue necessary instructions to expedite the works of implementation.

Co-ordination

A Planning Section of Paurashava should have close interaction with the citizen of Paurashava at large in order to make people aware of the benefits of a good plan and, therefore, their social responsibility to promote plan implementation in one hand and also resist contraventions on the other. A specific interactive cell is recommended to operate in this regard with following responsibilities:

- Provide pre-application advice to residents, consultants and developers about landuse management issues and application procedures for the submission of development applications.
- Enforce planning and landuse management related legislation and zoning scheme regulations.
- Issue of property zoning certificates.
- Investigate and resolve landuse management complaints, illegal landuse and prosecuting contraventions.

Such interactive windows may be opened in various convenient locations to ensure ease of the answers to commonly asked questions may be shown in the internet. Besides, those may be shown in the print and electronic media time to time.

In spontaneous areas, while all out people's co-operation is needed for project implementation; there will also be some elements of negotiation. Negotiation will be particularly needed in case of road widening projects. It will be a crucial task for Paurashava to convince the affected people to give up their land for road use. Efforts should be made to convince the land owners on the ground of enhancement of property value due to road widening. In case people refuse to offer land free of cost necessary arrangements may have to be made for payment of compensation. This process of negotiation will be very critical, cumbersome and time consuming, and therefore, has to be handled with utmost care and patience. The best results can be accrued only by wining people's confidence. In case the authority fails to get peoples co-operation they should exercise power of compulsory acquisition of land. Attempts may be made to engage NGOs / CBOs to work as catalysts in negotiation.

CHAPTER-11

TRANSPORTATION AND TRAFFIC MANAGEMENT PLAN

11.1 Introduction

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

The current chapter of the report is about Transportation and Traffic Management Plan covering its development plan proposals and traffic management up to the year 2031. Transportation and Traffic Management Plan is a part of the second stage of the current plan package. This planning component is based on the framework of the Structure Plan prepared in the earlier phase. The Plan is intended to address those areas of the Structure Plan that are likely to face urban growth during next 10 years, and obviously that includes the existing Paurashava area and its extension areas. The report also gives the objectives of the purpose and the role of Transportation and Traffic Management Plan and its relation with Structure Plan and Land Use Plan.

11.2 Approach and Methodology

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

Standard methodology was followed for traffic study in the project area as per the Terms of Reference. A nine hour traffic counting was conducted to assess the traffic volume at the most important traffic point. The Paurashava authority identified 2 different locations covering two entry/exit links of the Paurashava to conduct transport survey. These 2 locations include 2 intersections with 8 links and 16 directions. Detail description of survey stations are shown in Table-11.1. O-D survey was performed at all 2 entry/exit links simultaneously on different dates.

Table 11-1: Description of the survey stations

Intersection No	Intersection Name	Station/ Link No.	Link name (Survey station)	Traffic Direction
1	Busstand Moar	1	Norh-South	2
		2	South-North	2
		3	East-West	2
		4	West-East	2
2	Kazipara Moar	1	Norh-South	2
		2	South-North	2
		3	East-West	2
		4	West-East	2

Source: Field Survey, 2009.

Bus and tempo fleet data were collected from local transport owners' offices like, Bus Owners' Association, Tempo Owners' Association. They also provided information about routes, trips and movement data. Information about bus station and tempo station were collected from the respective owners' associations and the Paurashava/District Administration. Year wise data of non-motorized traffic were collected from the Kumarkhali Paurashava , where these vehicles are registered.

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

11.3 Existing Conditions of Transportation Facilities

11.3.1 Roadway Characteristics and Functional Classification

The planning area covers 5.27sq. km. (1301.39 acres) and road length is 65.48 km. The Rajbari-Kushtia Highway runs through the Paurashava and links a number of Connector Roads and Access Roads. National Highway is the major arterial road of the planning area. It provides connection with Kumarkhali Paurashava to the south Bengal and Dhaka. KumarkhaliBazar Intersection is the major inter section of the Paurashava and most of the traffic are generating from this area.

The roads of the Paurashava belonging to number of agencies named Roads and Highways Department (RHD) responsible for National Highway, Local Government Engineering Department (LGED) responsible for construction and maintenance of Upazila and Union roads and Kumarkhali Paurashavaresponsible for construction and maintenance of roads within the Paurashava area. Existing transportation system is dominated by road network catering to the passenger service and freight transport.

The road network provides access to various places within the study area and connects various parts of the country following bus routes. Major trips of vehicles are generated

from, within the Paurashava, Kumarkhali Bazaar and different wards within the Paurashava attracts the highest percentage of trips which is quite significant. Kumarkhali bazaar has the main agglomeration of different activities. Bazaar, Kumarkhali Police Station, Banks, Land Office and other administrative office are located near to Bazaar. People frequently travel to Rajbari, Faridpur, Jhenaidah and within the Upazilla for personal work or business purposes. People coming to the Paurashava area from long distances for different commercial or business purpose is also remarkable.

The field survey data reveals that within total amount of road 46.78 km is Pucca road, 5.91 km is brick soling Semipucca road, 46.78 km is Katcha road.

Table 11-2: Road network of Kumarkhali Paurashava

Road Type	Road Length (km)	Percentage
Katcha Road	12.79	19.53
Semipucca Road	5.91	9.03
Pucca Road	46.78	71.44
Total	65.48	100.00

Source: Physical Feature Survey 2009

Road network has not developed in a planned manner and has not any definite street pattern. All the local roads are of irregular street pattern, which are also narrow and crooked in nature. The secondary/distributor roads are 16-20 feet width and the collector roads are 8-10 feet width. Road side vegetation and street light system were not found in the Paurashava area.

Table 11-3: Hierarchy of roads in Kumarkhali Paurashava

Type of road	Width in feet	Surface type
Arterial or major thoroughfare	80	Pucca
Secondary/ distributor road	16 - 20	Pucca
Tertiary /Collector road	12 - 15	HBB & Katcha
Private road	8 - 10	Katcha
Pedestrian road	No	-

Source: Physical Feature Survey 2009

Rajbari to Kushtia Road intersects Kumarkhali Paurashava from West to East which is the main arterial Road; Kumarkhali to Tebaria Road is connected to Rajbari to Kushtia Road from East to West direction as well. Bazar Road and Akbar Hossain Mia Road are linked with the main Road and act as the major feeder road for project area. The hierarchical patterns of roads as exists in the Paurashava are principal roads which are linked by several secondary roads. These secondary roads are connected with tertiary /access roads as exist in the built-up sections of the Paurashava.

Motorized and non-motorized vehicles are operated in all the nodes of the planning area. The non-motorized vehicles are mainly operated within short distance and meet the local needs. The motorized vehicles are mostly intercity passenger buses and trucks, mainly carry agro product from the Old Bazar towards Madaripur and Dhaka. Locally modified motorized transport vehicle named *Nosimon* also uses for short distance passenger and goods transportation.

11.3.2 Mode of Transport

For inter-zonal/ regional movement, bus services are available from Kumarkhali to the following destinations:It is observed that among the generated trips purpose for home covers the most. Second comes trips for work/personal business. The trips originate mostly within the Paurashava and they end mostly at the same Paurashava. Therefore it is clear that attention should be given to make the trips within the Paurashava smooth enough so that people may communicate easily and with convenience. People prefer to shop in Kumarkhali Paurashava, as there are better and varied options. If adequate options for shopping can be created in Kumarkhali, inhabitants of the Paurashava along with its surrounding areas may be benefited with improved road network. Motorcycle and Bicycle are also found popular in the Paurashava. Hired Battery Powered Auto Rickshaw, Rickshaw and Motorcycle are also used to travel long and short distances. Three-wheeler auto rickshaws (Auto Bike) are used for long distance trips. Three-wheeler auto rickshaw is very useful for two types of trips on demand basis, regular trip and Irregular trip. Regular trips have some specific destinations and specific routes. These trips also have fixed fare. Rajbari to Kushtia Road and Kumarkhali to Tebaria Road are the frequently used road for the hired auto rickshaws. It is also observed that more people prefer to walk to complete their short distance trips. For short distance trip purposes, rickshaw is used dominantly for different purposes. People of all class use rickshaw as it is cheap. Personal motorcycle and bicycle use is observed to be significant in the Paurashava. Considerable numbers of trucks are also found using some of the local roads regularly for carrying goods for the destinations outside the Paurashava area. Locally manufactured motorized vehicles called Nocimon-Korimon and Small truck are found plying in the Paurashava roads for carrying the local goods. Three wheeler richshaw-vans are also found in the town for carrying local goods. For water transport only traller and local boats are used.

11.3.3 Intensity of Traffic Volume

Traffic flow helps in roadway transportation to understand vehicles on the roadways interact with each other and impact the overall movement of traffic at any given time. Traffic flow is regulated by vehicle-vehicle interactions and interactions between vehicles and the roadway.

Depending on the location and land use around that location, traffic flow varies over different periods of the day. In this context, the peak hour flow has a special meaning. Depending on the land use and socio-economic characteristics of the town, traffic flow of 13 hours (from 7 am to 8 pm) was divided in to 4 periods according to the peak and off peak period of traffic flow. The periods were 7 am to 8 am (off- peak); 9.00 am to 1.00 pm (Peak); 1.00 pm to 4.00 pm (peak) and 4.00 pm to 8 pm (Peak). There could be more peak periods in a day. Sometimes these peak periods could cover more than one hour.

The highest peak hour traffic is usually taken into account in determining the adequacy of the road section, i.e. to determine whether the road section gets congested at certain hours of the days. Traffic flow survey has been carried out in selected roads of the project area and has been discussed in the following paragraphs.

In order to formulate Transport Plan for Kumarkhali Paurashava, traffic movement and volume count of traffic have been conducted. To understand the volume of traffic in Kumarkhali Paurashava traffic count has been conducted at two major intersections viz., Bus Stand Mor and Kazipara Mor . Traffic volumes of this intersection with corresponding direction of flow are shown in the Table 11.4. The Table shows that in hat days Bus Stand Mor is busiest in the Kumarkhali Paurashava.

Table 11.4: Average Daily Traffic volume

Node	Directions	Motorized					Non-Motorized				Total Motorized	Total Non-Motorized	Grand Total
		Bus	Truck	Car/ Microbus	Baby taxi/ Motor-cycle	Nosimon	Rickshaw	Van	Animal Push Cart	Bicycle			
Bus Stand	North-South	0	0	0	784	300	1945	2202	25	1310	1084	5482	6566
	South-North	0	0	0	895	199	2066	2311	26	1491	1094	5894	6988
	East-West	189	235	176	1065	305	1919	2318	17	1232	1970	5486	7456
	West-East	189	235	176	1151	210	2094	2360	23	1370	1961	5847	7808
Sub Total		378	470	352	3895	1014	8024	9191	91	5403	6109	22709	28818
Percentage		1.31	1.63	1.22	13.52	3.52	27.84	31.89	0.32	18.75	21.20	78.80	100.00

Source:Traffic and Transport Survey by DDC, 2009-2010

Peak Hour total Discharging Traffic Volume and Corresponding PCUs

It is necessary to bring all types to a common unit and the normal practice to convert the flow into equivalent passenger car units (PCUs) is by using certain equivalence factors. The flow is then expressed as PCUs per hour or PCUs per day. PCU factor considered for the Project and the value recommended of other studies and practices have been mentioned in the survey report of Kumarkhali Paurashava.

From the traffic volume survey of Kumarkhali Paurashava it seems that in evening from 6pm to 7pm the major roads are jam-packed with traffic with the non-motorized vehicles and especially by rickshaw.

The individual Peak Hours of the Traffic Survey conducted for major link roads have been identified and then multiplied with the value of equivalence factors, as given in Table 11.5. It is noted that motorized traffic is much lesser than the Non-motorized traffic in all of the Roads of Kumarkhali Paurashava. The Peak Hour Traffic in terms of the PCUs is determined for all the Traffic survey locations

Table 11.5: Peak hour Traffic Volume at Kumarkhali Upazila Mor

Day	Links at Bus Satnd Mor	Time	Motorized					Non-Motorized				Total Motorized	Total Non-Motorized	Grand Total	PCU
			Bus	Truck	Car/ Microbus	Baby taxi/ Motor-cycle	Nosimon	Rickshaw	Van	Animal Push Cart	Bicycle				

Hatday	Bus Stand Mor to North-South	11.00 am-12.00 pm	0	0	0	72.75	21	434	518	24	81	93.75	1057	1150.75	1151
	Bus Stand Mor to South-North	11.00 am-12.00 pm	0	0	0	56.25	12	476	512	0	62.5	68.25	1050.5	1118.75	1119
	Bus Stand Mor to East-West	11.00 am-12.00 pm	45	72	18	82.5	21	434	518	0	71.5	238.5	1023.5	1262	1262
	Bus Stand Mor to West-East	06.00 pm-07.00 pm	45	60	16	81.75	26	474	502	0	65.5	228.75	1041.5	1270.25	1270
Non-Hatday	Bus Stand Mor to North-South	10.00 am-11.00 am	0	0	0	61.5	39	402	464	0	68	100.5	934	1034.5	1035
	Bus Stand Mor to South-North	06.00 pm-07.00 pm	0	0	0	68.25	21	492	508	0	75.5	89.25	1075.5	1164.75	1165
	Bus Stand Mor to East-West	06.00 pm-07.00 pm	48	63	16	78	29	416	492	0	60	234	968	1202	1202
	Bus Stand Mor to West-East	06.00 pm-07.00 pm	48	63	16	85.5	27	496	524	0	68	239.5	1088	1327.5	1328

Source:Traffic and Transport Survey by DDC, 2009-2010

11.3.4 Level of Service: Degree of Traffic Congestion and Delay

The service which a roadway offers to the road user can vary under different volumes of traffic. The Road capacity Manual has introduced the concept of "Level of Service" to denote the level of facility one can derive from a road under different operating characteristics and traffic volumes. The operating conditions for the six levels of service selected by the Manual are given below, Level 'A' representing the highest and Level 'F' representing the lowest:

Information of the vehicular volume using a road network is important for understanding the efficiency at which the system works at present and the general quality of service offered to the road users. Determination of the standard of performance of a particular road intersection, as well as, individual road section depends upon the Volume-Capacity Ratio (V/C Ratio). The V/C ratio is defined as the ratio of maximum actual volume of traffic in the peak hour in a road way, expressed in PCUs per hour to capacity of that roadway expressed in PCUs per hour.

Standard Level of Service

The service which a roadway offers to the road user can vary under different volumes of traffic. The Road capacity Manual has introduced the concept of "Level of Service" to denote the level of facility one can derive from a road under different operating characteristics and traffic volumes. The operating conditions for the six levels of service selected by the Manual are given below, Level 'A' representing the highest and Level 'F' representing the lowest:

Level of Service A:

Zone of Free flows, with low volumes and high speeds. Traffic density is low and little or no restriction in maneuverability. The V/C ratio for this level of Service should not exceed 0.33.

Level of Service B:
Zone of stable flow, with operating speeds beginning to be restricted some what by traffic conditions. The V/C ratio for this level of Service should not exceed 0.50.

Level of service C:
Still in the zone of stable flow, but speeds and maneuverability are more closely controlled by higher volumes. The V/C ratio for this level of Service should not exceed 0.65.

Level of Service D:
This service is related to unstable flow, with tolerable operating speeds being maintained though considerably affected by changes in operating conditions. The V/C ratio for this level of Service should not exceed 0.80.

Level of Service E:
Flow is unstable with volumes at or near the capacity of the road. The V/C ratio for this level of service should not exceed 1.0.

Level of Service F
Forced flow operations at low speeds, where volume is more than the capacity, speeds are reduced substantially and stoppages may occur for short or long period of time.

In the project area the consultants have performed traffic survey in major Road way links on the basis of that traffic survey; the consultants have evaluated the performance of those Roads sections. The only quantitative measure for the performance evaluation of sections that has been used in the study is volume to capacity ratio (V/C ratio). Traffic capacity is defined as the maximum hourly rate at which vehicles can reasonably be expected to traverse a roadway during a given period of time under prevailing roadway, traffic and control conditions and expressed as PCUs per hour. Peak Traffic Volume is defined as the actual peak hour traffic passing a particular roadway during a given time period and expressed as PCUs per hour.

Capacity of a roadway largely depends on number of lane, road width and roadway condition. However, capacity was calculated in PCUs per hour and the standard capacity of a lane is assumed as 1400 PCUs per hour. So, the capacity of the entire major link roads are calculated by applying 1400 PCUs per hour per lane and the peak hour Traffic volume is obtained from Traffic Survey data and the individual V/C ratio of all the those Roads sections is calculated and the corresponding level of service are evaluated and presented in Table 11.6.

Table 11.6: Evaluation of the Level of Service of Road Intersections

Name of the Major Link Roads	Number of Lanes	Peak Hour Traffic Volume (V) (PCU Per Hour)	Capacity (PCUs per Hour)	V/C Ratio	Level of Service
Rajbari to Kushtia Road	1	1262	1400	0.90	E
Bazar Road	1	1162	1400	0.83	E

** Based on 2-Day Traffic Survey by the Consultants*

*** PCUs= Passenger Car Units*

11.3.5 Facilities for Pedestrians

During field survey, it was observed that people move in both directions, going in and out of the both sides of the roads. It is noted that the study area is without any footpath for pedestrian movement. Pedestrian movements take place mostly on carriageway and right of way of the roads.

11.4 Analysis of Existing Deficiencies

11.4.1 Roadway Capacity Deficiencies

Primary Road : The Rajbari-Kushtia Highway is known as primary road, length is 5.36 km and average width pavement with 5.80 pavement width with average ROW 100 feet. Road standard (ROW) recommended in the is 100 feet to 150 feet, proves that the standard (ROW) of the existing primary road in the Paurashava is enough.

Secondary Road: Major secondary roads are Kumarkhali to Tebaria Road, Bazar Road and Akbar Hossain Mia Road.The width of these roads varies from 4.6-5.24 meters. Recommended Road standard (ROW) 60 feet to 100 feet, proves that the standard (ROW) of the existing secondary roads in the Paurashava is lower than the standard (ROW) recommended. Moreover, in hat day and non-hat day, highest volume of traffic flows on those secondary roads is about 300 PCU/hour. No deficiencies regarding the capacity of those secondary road exits.

Tertiary Road: In the Paurashava, Recommended standard (ROW) for tertiary road is 20 feet to 40 feet, proves that the standard (ROW) of the existing tertiary roads in the Paurashava is lower than the standard (ROW) recommended. No deficiencies regarding the capacity of those tertiary road exits.

Access road: Road standard (ROW) recommended for access road is 20 feet to 40 feet. in the Paurashava, all access roads are less than 12 feet and most of them are using as footway. Non-motorized vehicles named Van sometimes use those walkways. No deficiencies regarding the capacity of those access road exits.

Table 11.7: Major Local Roads of Kumarkhali Paurashava

Sl no.	Road Name	Direction	Type	Length(km)	Width (m)
1	Rajbari to Kushtia Road	Rajbari to Kushtia	Pucca	5.36	5.80
2	Kumarkhali to Tebaria Road	Kumarkhali to Tebaria	Pucca	2.31	5.24
3	Bazar Road	To Bazar	Pucca	0.85	4.86
4	Akbar Hossain Mia Road	-	Pucca	1.21	4.60

Source: Physical Feature Survey by DDC, 2009-2010

Rajbari to Kushtia Road intersects Kumarkhali Paurashava from West to East which is the main arterial Road; Kumarkhali to Tebaria Road is connected to Rajbari to Kushtia Road from East to West direction as well. Bazar Road and Akbar Hossain Mia Road are linked with the main Road and act as the major feeder road for project area. The hierarchical patterns of roads as exists in the Paurashava are principal roads which are linked by

several secondary roads. These secondary roads are connected with tertiary /access roads as exist in the built-up sections of the Paurashava.

11.4.2 Operational, Safety, Signal and other Deficiencies

- Traffic management system is absent in the Paurashava. No operational system yet being imposed on traffic movement.
- Due to the minimum PCU/hr. both in hat and non-hat day, availability of non-motorized vehicles and absent of available built-up area, road safety exists naturally in the Paurashava.
- Traffic signaling system is totally absent in the Paurashava. Generally, traffic signaling system will not be needed up to the limit of the planning period. On some specific point of primary and secondary roads, traffic signaling will be needed.

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

Existing Railway Network
3.54 km railway network is found in the Paurashava

Existing Waterway Network
There is a river named Garai within the Paurashava. the water way network quite developed by the river.

Existing Airport
No air way faculties in the Paurashava.

11.6 Future Projections

Road design standards are prescribed in the section 21 of the Public Roads Act, 2004. The regulations of the sections are:

The Government may declare design standards for roads by publication in the Official Gazette.

- The road design standards shall set out design requirements for roadways and road-related areas including structures located on roadways or road-related areas.
- A road authority shall comply with the road standards when carrying out works on a roadway, road-related area or when installing, modifying or maintaining a structure on a roadway or road-related area.
- Despite sub-section (3), a road authority is not required to comply with the road standards if:
    - the road authority is carrying out maintenance and, in the view of the road authority, it would not be practicable to comply with the road design standards.
    - the Government has, in writing, exempted the road authority from complying with the road design standards in relation to the works or structure.
- The Government may revoke or amend road design standards in the same manner as a declaration.
- The Urban Area Plan for Dhaka City has recommended road standards with the consideration of traffic volumes, which were not undertaken in conjunction with the Dhaka Integrated Transport Study (DITS). A wide range of standards was suggested

for various classes of roads, ranging from 4 meters to 24 meters, as mentioned below. The required right of way (ROW) is also indicated:

- Main Road 24.0 meter (78 ft) ROW
- Arterial Road 14.5 meter (47.5 ft) ROW
- Collector Road 13.0 meter (42.6 ft) ROW
- Access Road 9.0 meter (29.5 ft) ROW
- Access Road 6.0 meter (19.7 ft) ROW
- Non-motorized Road 4.0 meter (13.4 ft) ROW
- Footpath 2.5 meter (8.2 ft) ROW

In order to promote development of all roads in a systematic manner, new road standards were recommended for both built up areas, as well as for less built-up areas. These will replace the old standards, which were included in the Dhaka Metropolitan Development Plan (DMDP). The standards, when adopted will facilitate earmarking the right of way (ROW) for all major roads. The details of these standards used in this plan are indicated below.

Table 11.8: Road standards for future development of the network

Class of Roads	Standards recommended
Paurashava primary roads	150-100 ft.
Paurashava secondary roads	100-60 ft.
Paurashava local roads	40-20 ft.

Source: UTIDP, LGED, 2010.

11.6.1 Travel Demand Forecasting for Next 20 Years

Existing road network is quite enough for accommodating present volume of traffic. The study area is rural in nature. Katcha roads needs to be constructed as pucca or at least semi-pucca. Katcha roads become clayey in the rainy season and bring immense sufferings for the users. As a result, social, cultural and economic activities are disrupted significantly at that time. A very limited uses of small boats are found for transportation of goods within the short distance particularly on hat day. Due to the absence of effective alternatives, passengers and goods movement of the study area is largely dependent on road transportation. This dependency will be calculated according to the increase of accessibility, consideration of the missing links, volume of traffic movement, bulk density of the area and economic importance of the area. Growth direction is also a considerable component for the demand analysis of the road.

11.6.2 Transportation Network Considered

The physical feature survey has identified a number of problems constraining the development of the Paurashava, such as:

- Lack of a hierarchy of roads within the Paurashava with many of the roads unable to fulfill their intended functions adequately;
- Scarcity of reserves of land for future roads; and
- A tradition of encroachment in those areas where road reserves have been made.

To establish a rational hierarchy of roads in the Paurashava, it will be needed to use development control to ensure that reserves of land, once established are maintained.

In the Transportation Plan, north, south, east and west direction links with the Paurashava have been considered. To maintain an effective linkage, the plan proposes one primary road and others are secondary and tertiary roads.

11.6.3 Future Traffic Volume and Level of Service

The roads presented in the Table-11.7 are the important roads of the Kumarkhali Paurashava. Present population of the Paurashava is 21914(2011) and in the year 2031 it will be 27091. Highest PCU/hr. at hat day is 1270 and non-hat day is 1380. The scenario proves that traffic congestion is not alarming. At the sametime, highest secondary road width at present is 24 feet (ROW) and it will be saturated with the traffic if the PCU/hr. increases above 800.

At present about 66.47% of the total surveyed household is in the income level BDT 3501-8000 which is the highest share of percentage. The income level BDT 8001-13000 comprises second highest percentage (15.59%) of the households in the Paurashava. On the other hand main primary occupation is Business (34.67%) followed by Regular Employment (19.59%), Handloom (8.57%).The scenario proves that the Paurashava dwellers have no capability to increase traffic volume provisioning motorized vehicles. They will increase non-motorized vehicles and Nosimon.

With the expansion of administrative services, motorized public vehicles will be increased and at the sametime, traffic volume also.

At present, about 90% traffic is under the private sector and 88% enjoying by the non-motorized vehicles. It is expecting that the scenario will change next 20 years and the percentage of motorized vehicle will increase.

11.7 Transportation Development Plan

11.7.1 Plan for Road Network Development

For an efficient road network development, implementation of some of the recommendations made by the Roads and Highways Department in 2008 would be essential. In order to serve the Paurashava, as well as the local traffic around Paurashava, an analysis will present in the proposals. It is found that many of the road links are not recommended by the Roads and Highways Department. Further analysis under the Transportation Plan will be revealed that most of the links suggested by this study are infect required to be developed in a phased manner. Under the Transportation Plan, an attempt is being made to promote existing major link roads in the Paurashava which are Kumarkhali to Tebaria Road Bazar Road and Akbar Hossain Mia Road. At present, from west to eastern part and from south to northern part, all vehicles movement is through the link road with Kumarkhali Bus Stand. There is a need of east-west link road. A100 feet wide link road has prosed from Rajbari-Kushtia highway to Garai river ghat.Besides that there is a need of link road and some new road development.

11.7.2 Road Network Plan

The primary road will act as through-route, taking traffic from Paurashava to other centres in the region or the country and avoiding the need for this through-traffic to

enter the internal road network of the Paurashava. The route is intended to be high capacity and fast flowing. In the case of existing roads in Paurashava (designated as secondary and tertiary roads), this may require the introduction of side collector roads which restrict entry onto the main carriageways from roadside development. Without this, the road may not be able to fulfill the function.

Improvement of other local roads

Improvement of other local roads which deserve priority attention and could contribute a lot in reducing pressure on the existing focal points of the Paurashava all tertiary road is essential.All tertiary roads consisting have been identified and proposed for widening. An initiative should be taken to develop an effective and efficient arterial road network, which could provide a gridiron system with lots of alternative links for movement in different directions.

11.7.3 Proposal for Improvement of the Existing Road Networks

Use of road reserve is the initial stage for improvement of existing **primary road**. The maximum recommended reserve width for a primary road that will be adopted and maintained is 48 meters; with an initial basis the extremities of the reserve being 24 meters on either side of the road centre line. This may vary, especially on existing roads, due to localized circumstances.

Map 11-1: Important Roads of KumarkhaliPaurashava

Alternative cross-sections for the primary road is –

- a primary road with no collector roads (22 meters);
- a primary road with a collector road on one side only (32 or 35 meter);
- a primary road with collector roads on both sides (42, 45 or 48 meters).

Regardless of which option is required, initially the full 48 meter reserve will be applied, although not necessarily purchased in the first instance, until such time as more detailed site investigations have been undertaken.

For new road, the 48 meter reserve will be adopted in the short-term to prevent development encroaching in to it before construction of the road.

Within the established reserve, no further non-road related development will be permitted, with the exception of utility networks. The utilities should not fall under the main carriageways due to the disruption to traffic flows when the system requires repair or maintenance. Localized drainage channels should, where possible, also fall within the road reserve, preferably under the footpath or hard shoulder to reduce land requirements. If, however, this is not possible an additional reserve to cover the drainage channel will be required, increasing the overall width of the reserve.

Permanent structures that currently fall within the reserve should be permitted to remain until such time as they are redeveloped. Redevelopment of existing properties should fall wholly outside the reserve. Temporary structures should not be permitted even on a short-term basis. Existing structures should be removed as and when feasible.

For new roads, where reserves have been identified but implementation is unlikely to commence for a number of years, agricultural use of the land within the reserve should be permitted until such time as the land is required for construction. No structures, of whatever materials, will be permitted within the road reserve.

No direct access should be allowed onto the main carriageways (of primary road). Access should be gained only at controlled junctions–roundabouts or traffic-lights. The number of junctions or intersections should be minimized with desired spacing being not less than 500 meters.

Primary road with secondary roads should be provided in areas where there is considerable roadside development. These should generally be two-way service roads and will be used by non-motorized vehicles like rickshaw, van, pushcart and bullock carts including pedestrians. Controlled parking will be permitted where necessary.

Where secondary roads will not be required either immediately or in the long-term, the full reserve should be maintained (for utilities, etc.) unless there is clear reason why these reserves should be decreased.

Functions of the **secondary roads** is to act as –

- links between the Paurashava and primary roads;
- links between various important nodes of activity within the Paurashava.

The secondary roads are also intended to be high capacity routes, although their design speed will be significantly less than primary roads due to their being a far higher percentage local, inter-Paurashava traffic movements rather than intra-Paurashava. On many occasions within the Paurashava, existing routes will require the provision of tertiary roads to provide access to shop frontages and on-street parking for those shops. The tertiary roads also serve to collect traffic which currently enters at random from side streets.

The maximum recommended reserve that will be adopted and maintained for secondary road is 48 meters, preferably with the extremities of the reserve being 24 meters either side of the road centre line, although this may vary especially on existing roads due to localized circumstances.

Regardless of which option is required ultimately, initially the full 48 meter reserve should be applied until such time as a more detailed site investigation has been undertaken and the actual reserve required has been defined.

No non-road related development will be permitted within the road reserve. For new roads which will not be constructed in the foreseeable future, agricultural use of the reserve will be permitted until such times as the road is constructed. No permanent or temporary structure will be permitted.

In general, no direct access will be permitted onto the main carriageways (of secondary roads) with access gained only at controlled junctions. Occasionally, due to existing situations, access from a side road may be entertained. The number of junctions should be minimized with desired spacing being at 200 meter intervals. Again, this may vary according to necessity but where deviation from this desired spacing is necessary, the deviation should be small. Junctions will be in the form of roundabouts or traffic lights.

Limited direct access will be allowed from major traffic generators such as Paurashava Office complexes, factories and shopping centres where no other alternative access arrangement is feasible. Car parking arrangements for those large landuses must be provided on off-street.

Functions of the **tertiary road** are:

- collect and distribute traffic to and from access roads from predominantly residential areas to other parts of the hierarch;
- provide direct access to roadside landuses.

The recommended reserve for tertiary road is 18 meters, 9 meters either side of the centre line. On-street parking may be permitted.

No development will be permitted within the 18 meter reserve.

Direct access will be permitted although major generators should be required to have off-street parking areas. Junctions should be a minimum of 150 meters apart.

Access roads provide access to residential areas and properties therein. On-street parking is permitted providing that this will not block the access road.

Recommended reserve for access is 10 meter, although in existing situations, a minimum reserve of 6 meter will be entertained.

Junctions and access roads should be a minimum of 50 meters apart, although deviation to this will need to be accommodated in existing areas.

Direct access from residential properties will be permitted.

11.8 List of Proposed New Roads

A number of new roads including improvement of existing roads are presented in the following table. In the Paurashava, one primary road named National Highway lying with length 5.21 km under the Paurashava jurisdiction.

All the roads may be constructed under the road development scheme approved by the government for the authorities named RHD, LGED and Paurashava. In total, 65.48km roads existing in the Paurashava and 60.16 km roads have been proposed for efficient accessibility of the Paurashava of which some are fully new road and others are road widening. Details of roads proposal and phasing are given in **Annexure-2.**

The process that the Paurashava/RHD can undertake to establish new road reserves for each of the proposed roads shown on the Transportation and Traffic Management Plan is described below:

- Initial step will be to determine two points between which the new road will be required. In certain instances, the precise intersection or connection point will be obvious, whilst in other cases only a generalized location is identifiable in the first instance. Determination of the exact connection points can only be made once further steps in the process have been undertaken.
- Having identified two connection points (either known or vague), next step will be to conduct a search of a wide area to identify a number of alternative routes. Width of the area subjected to this search will vary according to individual circumstances, with the area being relatively narrow in dense Paurashava locations (say 80 to 100 meters), but wider in more rural settings (say 200 to 300 meters).
- The number of alternative alignments to be identified will also vary, but as a general rule, a maximum of five alignments will be chosen. When identifying each of the different alignments, care will be taken to ensure that they are realistic and capable of accommodating the width of reserve required for the standard of road envisaged.

Table 11.9: Proposed roads accourding to width

SerialNo	Road Width(Feet)	Length(Km)	Percentage	Type
1	100	7.05	11.72	Primary
2	60	2.79	4.64	Secondary
4	40	20.28	33.76	
5	30	16.98	28.21	Tertiary
6	20	13.01	21.69	Access
Total		60.16	100.00	

During this stage of the process, number of buildings, other structures or natural environment affected by the proposal should be seen as a constraint, but not yet as a major constraint. That being said, following the rule for realism stated above, the alignments will need to respect as much existing permanent development as possible, aiming instead, in dense situations, to target gaps between developments rather than through them. Only where the avoidance of specific buildings or groups of buildings is unavoidable, to produce a worthwhile alignment, should their removal be seen as part of that alternative's cost.

Similarly, in rural locations or in areas of high natural environmental quality, extreme care should be exercised when choosing the alternatives to respect the natural environment and choose options that are going to minimize the visual impact of a new road or avoid destruction of areas of the highest environmental quality.

Having established the alternative alignments, these will now be assessed, against set criteria to enable the Paurashava to choose a preferred option. The criteria that must be taken into account during this exercise include:

The impact of the alternative on existing properties: whether these are permanent or temporary and the type of development that is being affected. This, in part, will identify the general scale of compensation that will accrue with each of the alignments and therefore the viability of a route to be chosen as the preferred option.

The impact that each alignment will have on the general and natural environment: routes which have a high visual impact in an area of natural beauty will, for example, score badly on this criteria.

Amount of vacant public land available along each route: more land the government owns, the easier the project will be to implement and equally the lower the cost of an option, as the need to compensate landowners will be reduced.

The ease of construction: each alignment will need to be considered with again easier solutions not requiring major development items – bridges – for example, being preferred to more difficult proposals which will increase the cost of construction.

The severance of landuses and communities: need to be assessed, with preference been given to those routes that minimize severance.

Other more localized criteria may be included at the time of assessment.

- The result of this assessment exercise will identify for the Paurashava the route that should be considered as its preferred alignment. The reserve for this alignment will then become the area within which no development, other than for agricultural use, will be permitted.

11.9 Plan for Transportation Facilities

11.9.1 Transportation Facilities Plan

Transportation facilities and services include Bus Terminal, Bus Stoppage with Shade, Ticket Counter, Waiting Place for Travelers, Parking Space for Motorized and Non-

motorized Vehicles, Service Centre and Washing / Toilet Facilities. At present, no formal transportation facilities and services are available in the Paurashava.

There is no proposal for bus terminal as there is a newly constructed bus terminal. But a truck terminal has proposed along with national highway at ward ward 7& 8 with an area of 6.48 acre.**(Mouza schedule of for transport facilities are shown in table 10.6 of chapter -10).**

11.9.2 Parking and Terminal Facilities

Bus stand and intersections are using as bus stops including loading and unloading of man and materials. Those intersections are also using for parking both motorized and non-motorized vehicles. Informal economic activities also often encroaches road space. All those factors are together resulted in traffic congestions and also for a cause of accident. The new bus terminal and proposed truck terminal will include the parking area and loading and unloading facilities.

11.9.3 Development of Facilities for Pedestrian, Bicycle and Rickshaw

People of the Paurashava move using both sides of the roads. It is noted that the Paurashava is without any footpath for pedestrian movement. Pedestrian movements take place mostly on carriageway and right of way of the roads.

According to the standard for provisioning of footpath, 2.5 meter is necessary and it will be demarcated on both the sides of the road. Development of facilities for pedestrians, bicycles and rickshaws is relevant with the design criteria of the road.

11.9.4 Other Transportation Facilities

A tempo stand has also proposed in ward no-1 with aarea of 0.38 acres.

11.10 Waterway Development / Improvement Options

One boat ghat is found in the Paurashava. The boat ghat is under the jurisdiction of Paurashava authority. Construction materials such as sand brick and timber are carrying by boat from small growth centres adjacent to the Kumarkhali Paurashava to the Paurashava. There is a need of river ghat development on the bank of Garai River.

11.11 Proposal for Improvement of the Existing Waterway

Existing water way may develop with a ghat a the western side of Proposed Garai bridge in thePaurashava with loadind unloading facilities of construction materials..

11.12 Proposal for New Waterway Development

- Encourage private sector to involve with the construction of water ways. BOT (Build Operate and Transfer to the Government) system for private sector will appropriate.
- The Paurashava may, in collaboration with the Inland Water Transport Authority (IWTA), develop the water ways using the Garai River.

11.13 Railway Development Options

Existing railway station should develop with proper sitting arrangement and oter stationfacilities and sufficient commuter and inter city train sould link with the Kumarkhali PaurashavaRailway Station.

11.14 Transportation System Management Strategy (TSMS)

11.14.1 Strategies for Facility Operations

Following strategies will be adopted to operate the facilities related with the provisioning of suitable transportation system.

- An improved traffic management system should be imposed. All facilities involved with this system should be provisioned.
- The land uses at the intersections should be controlled with the provisioning of passenger shade, public toilet, ticket counter, tea stall and other necessary facilities.
- Parking facilities for motorized and non-motorized vehicles should be provisioned during construction of roads.

11.14.2 Strategies for Traffic Flow and Safety

Following strategies will be adopted to implement circulation network in the planning area:

- A comprehensive road network plan has been prepared for the Paurashava using a hierarchy of road network. Implementation will also be followed following this hierarchy.
- In case of local roads a participatory approach will be developed to realize at least a part of the development cost bears by the beneficiaries. This will also help to reduce delay and cost involved in land acquisition for road construction.

Map 11-2: Proposed Circulation Network for KumarkhaliPaurashava

Map 11-3: Proposed Transport Infrastructure of KumarkhaliPaurashava

- Incremental Road Construction Approach will be adopted to get rid of unnecessary construction costs, where roads remain underutilized.
- Service roads will be constructed along with the major roads to allow free flow of long distance traffic.
- A restricted buffer zone will be created along primary roads passing through agriculture to discourage roadside development.

11.14.3Strategies for Traffic Management

- Linking the missing links of primary, secondary and tertiary roads on priority, and widen some tertiary roads to make networks for efficient circulation.
- Provide adequate pedestrian facilities and off-street parking wherever needed.
- Not to allow any development within the right of way (ROW).
- Separate lane for non-motorized vehicles should be provisioned on the primary and secondary roads.

11.15 Plan Implementation Strategies

11.15.1Regulations to Implement the Transportation Plan

Following regulations will be needed for implementation of the plan.

Public Roads Act, 2004: Objectives of the Public Roads Act, 2004 is prescribed in the section 2. Those objectives are to:

a) establish ownership and responsibilities for roads;
(b) establish the framework for managing the road network;
(c) establish general principles for road management;
(d) provide for general design and planning principles for roads;
(e) confer powers and responsibilities on road authorities;
(f) commit road authorities to provide and maintain safe roads, and to do so using resources efficiently;
(g) provide for the establishment and classification of public roads;
(h) provide for data bases of public roads, and public access to them;
(i) set out rights and duties of road users;
(j) control activities on roads;
(k) make special provision for restriction on access to roads;
(l) identify characteristics of new road types;
(m) provide a legal framework for private sector participation in road construction, operation and maintenance, including tolling of roads;
(n) establish defenses for civil liabilities; and
(o) create offences and provide for penalties.

Section 5 has defined public roads as-

(1) The Government may declare a public road.
(2) The declaration may be made in relation to land, whether or not it is currently used for passage by members of the public.
(3) In the declaration, the Government shall classify the public road as:

(a) a national road; (b) a regional road; (c) a Zila road; (d) an urban road; (e) an Upazila road; (f) a union road; (g) a village road.

Motor Vehicles Ordinance, 1983 (Ordinance No. LV of 1983) was enacted in 22nd September, 1983. The Ordinance will be needed mostly for the registration of motor vehicles and issuing of driving license.

Stage Carriages Act, 1861 (Act No. XVI of 1861) was enacted in 7th July 1861. Section 1 of the Act has defined the term Stage Carriage and said, "every carriage drawn by one or more horses which shall ordinarily be used for the purpose of conveying passengers for hire to or from any place in Bangladesh shall, without regard to the form or construction of such carriage, be deemed to be a Stage Carriages within the meaning of this Act." Again, according to the section 2, no carriage shall be used as a Stage Carriage unless licensed by a Magistrate.

The Paurashava may, in communication with the RHD and LGED and with the prime approval from the Government may enforce the regulations as mentioned above. Again, some of the relevant regulations of developed countries may be enforced by the appropriate authority for the betterment of accessibility, road safety and road management. In connection with this concept, **Highways Act of England and Wales** may be followed.

According to the section 70(1*a*) of the **Highways Act of England and Wales**, the owner or occupier of any structure and the owner or occupier of any land on which a structure is situated shall take all reasonable steps to ensure that the structure or the use of the structure is not a hazard or potential hazard to persons using a public road and that it does not obstruct or interfere with the safe use of a public road or the maintenance of a public road.

(b) Where a structure or the use of a structure is a hazard or potential hazard to persons using a public road or where it obstructs or interferes with the safe use of a public road or with the maintenance of a public road, a road authority may serve a notice in writing on the owner or occupier of the structure or on the owner or occupier of any land on which the structure is situated to remove, modify or carry out specified works in relation to the structure within the period stated in the notice.

(2 a) The owner or occupier of land shall take all reasonable steps to ensure that a tree, shrub, hedge or other vegetation on the land is not a hazard or potential hazard to persons using a public road and that it does not obstruct or interfere with the safe use of a public road or the maintenance of a public road.

(b) Where a tree, shrub, hedge or other vegetation is a hazard or potential hazard to persons using a public road or where it obstructs or interferes with the safe use of a public road or with the maintenance of a public road, a road authority may serve a notice in writing on the owner or occupier of the land on which such tree, shrub, hedge or other vegetation is situated requiring the preservation, felling, cutting, lopping, trimming or removal of such tree, shrub, hedge or other vegetation within the period stated in the notice.

Again, section 71(1*a*) said that, any person who, without lawful authority or the consent of a road authority-

(i) erects, places or retains a sign on a public road, or

(ii) erects, places or retains on a public road any caravan, vehicle or other structure or thing (whether on wheels or not) used for the purposes of advertising, the sale of goods, the provision of services or other similar purpose, shall be guilty of an offence.

Section 76(1) of the **Highways Act of England and Wales** have provisioned regulations for a road authority and said, a road authority may-

a) construct and maintain drains in, on, under, through or to any land for the purpose of draining water from, or preventing water flowing onto, a public road,

b) use any land for the temporary storage or the preparation of any gravel, stone, sand, earth or other material required for the construction or maintenance of a public road.

11.15.2 Implementation, Monitoring, Evaluation and Coordination ofthe Plan

Implementation through Multi-Sectoral Investment Programme: Major infrastructure development works such as primary roads, secondary roads, transportation facilities etc., will largely be controlled by Government. Public works requires efficient co-ordination through the Multi-Sectoral Investment Programme (MSIP).

Objective of a Multi-Sectoral Investment Programme (MSIP) will match a list of the development projects with the funding stream necessary to implement them. There are two basic activities that would determine the contents of MSIP. One activity would be to prioritize and schedule the investment projects of all public agencies so they will collectively help to achieve the development goals and objectives of the Transportation and Traffic Management Plan. Second activity would be to analyze the source and availability of fund for the prioritized list of development projects.

Implementation through Action Plans and Projects: Action Plans and Projects will be the implementation plans to solve problems at the local level. Action plans will take a direct approach toward plan implementation with a minimum of research, reports or elaborate planning methods. These projects will be easily identifiable and will require minimum resource.

Implementation through Development Control: Landuse zoning is one of several methods of plan implementation to be considered. In all cases where some form of development, landuse control may be applied; careful consideration requires the following ideologies:

- the purpose to be achieved by the development controls;
- where controls should be applied;
- what aspect of development needs to be controlled;
- what type of development controls are required;
- what degree or level of development control is required;
- who will be affected by the required control;

- who will be affected by the controls and in what manner;
- when the controls should be applied;
- what will be the likely impact of the controls;
- how and by whom will the controls be administered and enforced.

Development control as an instrument of plan implementation may be selectively applied within the Urban Area Plans. Development controls would also be varied in intensity and detail to suit the particular circumstances. It is important that they should be clear and easily understood by all parties concerned. Since the entire Paurashava Master Plan 'package' has become statutory, development controls associated with its component plans would also be statutory.

Implementation by Facilitating Private Investment: Another approach that would be taken by government toward plan implementation will be to guide and facilitate investments made by the private sector. Government can achieve this with relative ease and at very low cost by setting up a legal and operational framework, coupled with suitable incentives, to facilitate land consolidation, plot boundary readjustment, efficient lay out of plots and provision of local infrastructure by the private sector. The benefits of this approach would be:

- increased efficiently of the urban land market would make, more private land available to urban households;
- would pass much of the development costs for local infrastructure to the private sector and land market mechanisms;
- would increase in land for development without large cash outlays by government to purchase land for development schemes; and
- would keep provision of land for community facilities virtually no cost to government.

Plan Monitoring

The Transportation and Traffic Management Plan would simply be tools for guiding and encouraging the growth and development of an urban area in a preferred manner. In a rapidly changing urban environment, the Transportation and Traffic Management Plan would require to keep up to date. If this is not done, within a few years it will be obsolete. Therefore, it is imperative that the requirement for regular updating of the Transportation and Traffic Management Plan be made a legal requirement.

For implementation of the various programme components of the Transportation and Traffic Management Plan appropriate administrative measures will have to be undertaken. This will essentially include project preparation and monitoring of their execution and evaluation. For carrying out all these activities appropriate institutional measures are also be needed.

Evaluation

Monitoring and evaluation of on going and implemented projects is essential to keep the future course of action on the right track. An on going project should be regularly monitored and handicaps identified to enable taking appropriate measures at the right time.

Post implementation evaluation is also needed to take appropriate measures correcting past errors-from project preparation to implementation.

The top level supervision has to be done by a high level supervisory committee headed by the Paurashava Mayor, LGED representative, RHD and Local Government Ministry. Other members of the committee will be local Ward Councilors, local community leader/social workers and the Town Planner of the Paurashava. The committee will supervise implementation works regularly and issue necessary instructions to expedite the works of implementation.

Co-ordination

A Planning Section of Paurashava should have close interaction with the citizen of Paurashava at large in order to make people aware of the benefits of a good plan and, therefore, their social responsibility to promote plan implementation in one hand and also resist contraventions on the other. A specific interactive cell is recommended to operate in this regard with following responsibilities:

- Provide pre-application advice to residents, consultants and developers about landuse management issues and application procedures for the submission of development applications.
- Enforce planning and landuse management related legislation and zoning scheme regulations.
- Issue of property zoning certificates.
- Investigate and resolve landuse management complaints, illegal landuse and prosecuting contraventions.

Such interactive windows may be opened in various convenient locations to ensure ease of the answers to commonly asked questions may be shown in the internet. Besides, those may be shown in the print and electronic media time to time.

In spontaneous areas, while all out people's co-operation is needed for project implementation; there will also be some elements of negotiation. Negotiation will be particularly needed in case of road widening projects. It will be a crucial task for Paurashava to convince the affected people to give up their land for road use. Efforts should be made to convince the land owners on the ground of enhancement of property value due to road widening. In case people refuse to offer land free of cost necessary arrangements may have to be made for payment of compensation. This process of negotiation will be very critical, cumbersome and time consuming, and therefore, has to be handled with utmost care and patience. The best results can be accrued only by wining people's confidence. In case the authority fails to get peoples co-operation they should exercise power of compulsory acquisition of land through Acquisition of Requisition of Immovable Property Ordinance, 1982. Attempts may be made to engage NGOs / CBOs / RHD / LGED to work as catalysts in negotiation.

CHAPTER-12

DRAINAGE AND ENVIRONMENTAL MANAGEMENT PLAN

12.1 Introduction

The consultant has made an extensive drainage network study in Kumarkhali Paurashava to improve the living standard of urban dwellers. Major activities of drainage study include:

- Survey for the alignment of drains / drainage channels by using DGPS, Data Logger and Path Finder software;
- Survey for the cross sections of drains by using optical level;
- Survey for the bottom level and area of local depressions;
- Identification of outfalls and drainage structures with their conditions;
- Development of Maps showing drains (with drainage direction).

The study has conducted with the concern of Paurashava Mayor, Councilors and other Paurashava representatives as well as PMO, LGED as per ToR in concentrating on following major issues:

- Information regarding type of man-made drains.
- Alignment and crest level of embankments, dykes and other drainage divides.
- Identification of missing links.
- Direction, depth of flow, maximum and minimum tidal level of river, flooding condition, condition of river side settlements during high tide and flood.
- Location, number and condition of pump station, sluice gates, drainage structures.
- Location and area of outfalls, ponds, tanks, ditches; condition in dry and wet season.

12.1.1 Goals and Objectives

The objective of Drainage Plan is to find out the present functions of main and secondary drains and natural streams within the Kumarkhali Paurashava . Secondly, to find out level of encroachment over drainage reservations responsible for flooding, water logging of neighborhoods during heavy rains. Thirdly, to find out, the existing roadside drainage pattern including capacities and collected gradients. Since planned development of Paurashava is very much desirable, Drainage Master Plan is necessary to ensure operation and maintenance of the present facilities including new proposal for future. For this, both short and long term project improvement plan involving area based drainage master plan is necessary to ensure proper drainage of the Paurashava.

12.1.2 Methodology and Approach to Planning

In implementing various infrastructural developments, drainage is generally given less priority and is normally considered to be the last or final steps for development. Such scenario is particularly true for Bangladesh; although different types of drainage infrastructures are among others by far the heaviest impact on physical infrastructure

network. As a result, physical environment, health, hygiene and standard of living suffer seriously. In development projects, Government, Semi-government and Public sector allocated funds are mostly spend on buildings, roads and other more visible infrastructures and drainage comes as the last item of development. By the time, drainage development begins to start, there appears shortage of fund, consequently as a matter of policy-do little or do-nothing situation appears and as eyewash very little is done for drainage development. In case of urban development, if drainage is not given priority, sufferings of the inhabitants will continuously increase with the passage of time.

Drainage development for urbanization should start with drains. Drains can be classified as Plot drains, Block drains, Tertiary drains, Secondary drains and Primary drains. Other natural drainage infrastructure is lowland, outfall areas, khals and rivers. Man-made drains are Plot, Block, Tertiary, Secondary and Primary drains and others are natural drainage infrastructures. In planning for drainage network, care has given on road network in terms of conflict of drainage and waterways with roads. Drainage and environmental survey was followed the proto-type questionnaire supplied and suggested by the LGED.

Method Used

Storm and used water: 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 run off of a particular area. The modified rational method shall be used for calculation of peak runoff for a definite frequency and duration from particular drainage basin. One limitation of this method is that it cannot be used for catchment area greater than 320 acres. The Natural Resources Conservation Service (NRCS) method formerly the US Soil Conservation Service (SCS) method shall be used.

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. The design flow rate by Modified Rational Formula is –

$$\mathbf{Q = C_s C_r IA}$$

Where:

Q	=	Design runoff flow rate (cfs)
I	=	Rainfall intensity (in/hr)
C_s	=	Storage coefficient
C_r	=	Runoff coefficient
A	=	Drainage area (acres)

Rainfall Intensity (I): The rainfall intensity is the average rainfall rate for a particular drainage basin or sub-basin. The intensity is selected on the basis of the design rainfall duration and return period. The return period is established by design standards as a design parameter. Rainfall intensity with 5 years return period is generally employed for

design of primary drains and canal improvement. Rainfall intensity with 3 years return period is employed for design of secondary drains. The design duration is equal to the time of concentration for the drainage area under consideration. Time of concentration is a critical parameter both for the Modified Rational Equation and SCS method. Time of concentration is generally defined as the longest runoff travel time for contributing flow to reach the outlet or design point, or other point of interest. It is frequently calculated along the longest flow path physically.

Estimating the time of concentration involves identification of an appropriate flow path or paths and estimating runoff travel times along the flow paths. Where post-development conditions include significant pervious surfaces, the time of concentration for just impervious portions of the basin may be required to calculate and compare peak flow response for the basin as a whole against that of the more rapidly-draining impervious surfaces alone. The Time of Concentration composed of the Initial Time of Concentration, sometimes referred to as the Inlet Time or Time of Entry and the Travel Time. Initial Time of Concentration is that time required for runoff to travel from the most remote point in the drainage area to the first point of concentration. This can be determined using the Kirpitch equation. The Initial Time of Concentration must be five minutes or longer. In instances where Initial Times of Concentration are estimated to be shorter than five minutes, five minutes shall be applied.

The second part of the Time of Concentration is the Travel Time that takes the flow to travel along the drain. Channel flow occurs in channels carrying integrated flows, pipes (flowing partially full), and streams. Where storage is not significant, Travel Times can be estimated by applying Manning's Equation, and using estimates of channel characteristics and appropriate roughness values for pipe, channel, or stream features as tabulated in Table-12.1

$V=[1.49/n] [R^{2/3}] [S^{1/2}]$

Where

V = Velocity of flow, feet/second
N = Manning's roughness coefficient for channel flow
S = Slope, feet/foot
R = Hydraulic radius, feet

And

$T_t = V / (60L)$

Where

T_t = Travel time, minutes
V = Velocity, feet/second
L = Length, feet

Manning's roughness coefficient for channel flow is listed in Table-3.1.

Table 12-1: Manning's "N" Values for Channel Flow

Conduit Material	Manning's "n"	Conduit Material	Manning's "n"
Closed conduits		Pipes	0.011-0.015
Asbestos-cement pipe	0.011-0.015	Liner plates	0.013-0.017
Brick	0.013-0.017	Open Channels	
Cement-lined & seal coated	0.011-0.015	Lined channels	
Concrete pipe	0.011-0.015	a. Asphalt	0.013-0.017
Helically corrugated metal pipe (12'' – 48'')	0.013-0.023	b. Brick	0.012-0.018
Plain annular	0.022-0.027	c. Concrete	0.011-0.020
Plan helical	0.011-0.023	d. Rubble or riprap	0.020-0.035
Paved invert	0.018-0.022	e. Vegetation	0.030-0.400
Spun asphalt lined	0.011-0.015	Earth, straight and uniform	0.020-0.030
Spiral metal pipe (smooth)	0.012-0.015	Earth, winding, fairly uniform	0.025-0.040
3 – 8 in. diameter	0.014-0.016	Rock	0.030-0.045
10 – 12 in. diameter	0.016-0.018	Un maintained	0.050-0.140
Larger than 12 in. diameter	0.019-0.021	Fairly regular section	0.030-0.070
Plastic pipe (smooth interior)	0.01.-0.015	Irregular section with pools	0.040-0.100

Source: Municipality of Anchorage. Drainage Design Guideline, March 2007 ver.4.08 pp-62.

Storage Coefficient (Cs): Due to very flat topography of Bangladesh, the runoff is significantly slow. The rainfall after evaporation and infiltration accumulates first in the depressions, until these have been reached their capacity and then runoff. To take these effects a storage coefficient is used. The value of the storage coefficient is based on average ground slope and the nature of the ground surface. Some of the storage coefficients are listed in Table-12.2.

Table 12-2: Storage Coefficients for flat land

Characteristics of surface	Storage Coefficient		
	Slope < 1: 1000	Slope < 1: 500	Slope < 1: 500
Residential urban	0.70	0.80	0.90
Commercial	0.80	0.90	1.00
Industrial	0.70	0.80	0.90
Residential Rural nature	0.60	0.70	0.80
Agricultural	0.50	0.60	0.70
Forest/woodland	0.30	0.40	0.50
Aquatic land	0.30	0.40	0.50
Paved area/road	0.80	0.90	1.00

Source: Countywide Comprehensive Plan (Master Drainage Plan) Exhibit-VIII.

Runoff Coefficient (Cr): The runoff coefficient (C_r) values shall be assigned to the various land use zoning classifications. The runoff coefficient values are based on the slope of the land surface, degree of imperviousness and the infiltration capacity of the land surface. The type of land use can greatly affect the amount of runoff. The quantity of runoff and peak flow rates are increased when the land is developed because the impervious surface area increases with the addition of roads, driveways, roofs, etc. The values of the runoff coefficient (C_r) for each land use classification are listed in Table-12.3.

Table 12-3: Modified Rational Method Runoff Coefficients

Land use designation	Runoff Coefficient C_r
Residential rural	0.30
Residential semi urban	0.40
Residential urban	0.50~0.60
Apartment professional	0.70
Neighborhood Commercial	0.85
Community Commercial	0.85
Industrial	0.70~0.75
Slum area	0.50~0.55
Agricultural exclusive	0.25
Forest and watershed	0.20~0.25
Public facilities	0.3~0.60
Forest/ woodland	0.25
Paved area/road	0.99

Source: Countywide Comprehensive Plan (Master Drainage Plan) Exhibit-VIII.

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

a. The peak rate of runoff at any point is a direct function of the average rainfall for the time of concentration to that point.
b. The recurrence interval of the peak discharge is same as the recurrence interval of the average rainfall intensity.
c. 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.

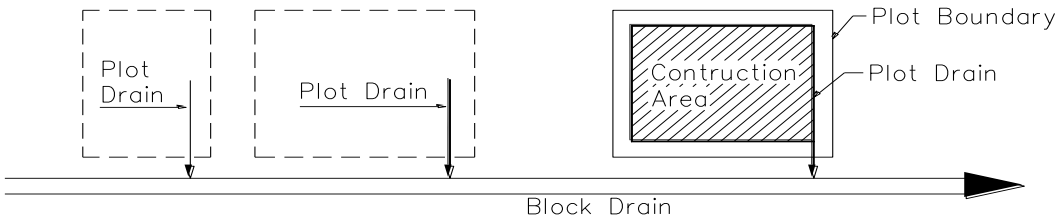
Projection

In implementing various infrastructures for development, drainage is generally given less priority and is normally considered to be the last or final steps for development. Such scenario is particularly true for Bangladesh; although different types of drainage infrastructures are among others by far the heaviest impact on physical infrastructure network. As a result, physical environment, health, hygiene and standard of living suffer seriously. In development projects, Government, Semi-government and Public sector allocated funds are mostly spent on buildings, roads and other more visible infrastructures and drainage comes as the last item of development. By the time, drainage development begins to start, there appears shortage of fund, consequently as a matter of policy-do little or do-nothing situation appears and as eyewash very little is done for drainage development. In case of urban development, if drainage is not given priority, sufferings of the inhabitants will continuously increase with the passage of time.

Drainage development for urbanization should start with drains. Drains can be classified as Plot drains, Block drains, Tertiary drains, Secondary drains and Primary drains. Other natural drainage infrastructure is lowland, outfall areas, khals and rivers. Man-made drains are Plot, Block, Tertiary, Secondary and Primary drains and others are natural drainage infrastructures. In planning for drainage network, care will be given on road network in terms of conflict of drainage and waterways with roads. In the following and

subsequent sections major element, their principle, purpose and function of drainage infrastructures are discussed and presented in lower to higher order which will be considered as a method for drainage plan.

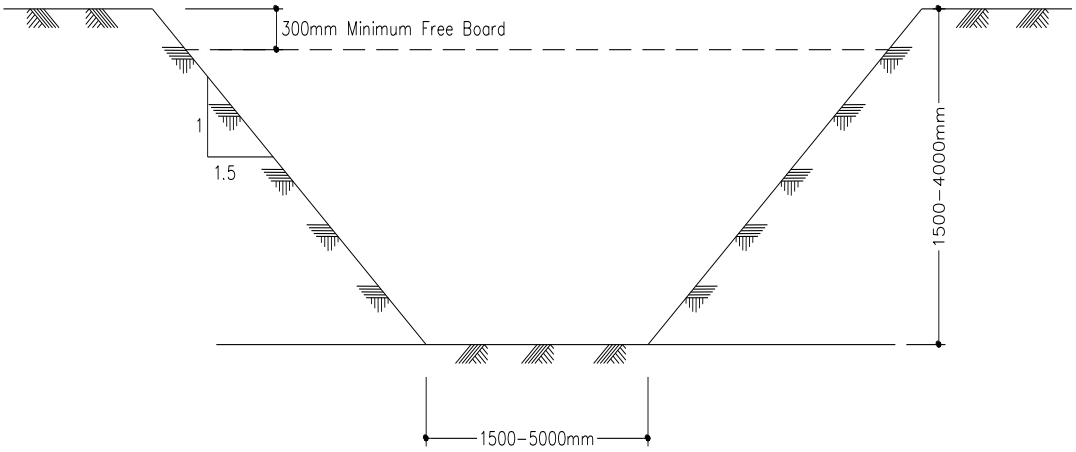
Plot Drains: Plot drains are provided around a building on a plot. In most cases, the drain is made of bricks and is rectangular in shape that can carry storm water generated in the plot and from the building. Plot drain is connected to the Block or Mohallah drain. The sketch below gives an impression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



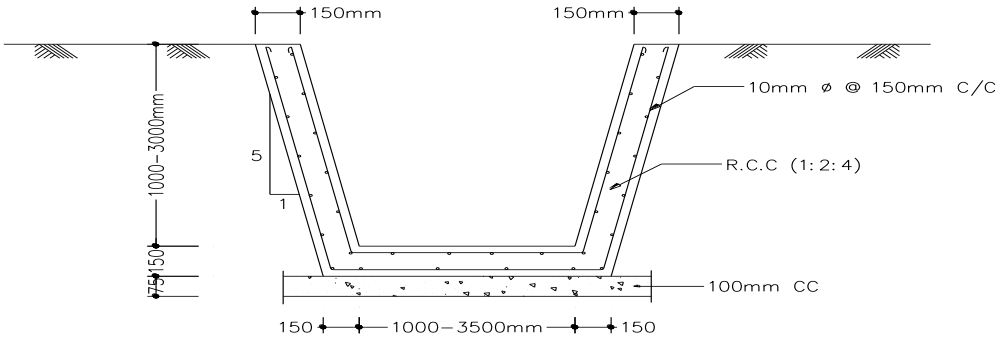
A Sketch Showing Plot Drain and Block Drain

Block Drain: Block drain is provided at the outside of a block that accommodates several buildings of the block. The block drains are made of bricks like plot drains but bigger in size so that it can serve the storm water generated within the block and the buildings and open areas within the block. Sometimes the block drain may serve few neighboring blocks or Mohallahs. Block drains carry storm water coming from the plot drains. Shape of the block drain is also rectangular, bigger than plot drains and its bottom is lower than plot drain. Sketch of the plot drain also shows the block or Mohallah drain under plot drain.

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

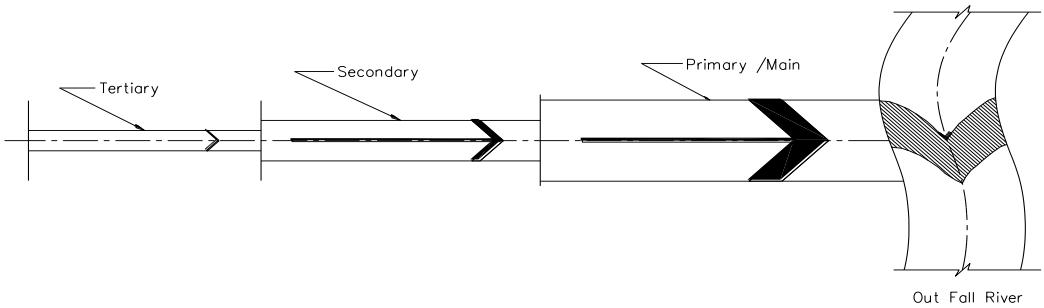


Typical Earthen Primary Drain



Typical R.C.C Primary Drain

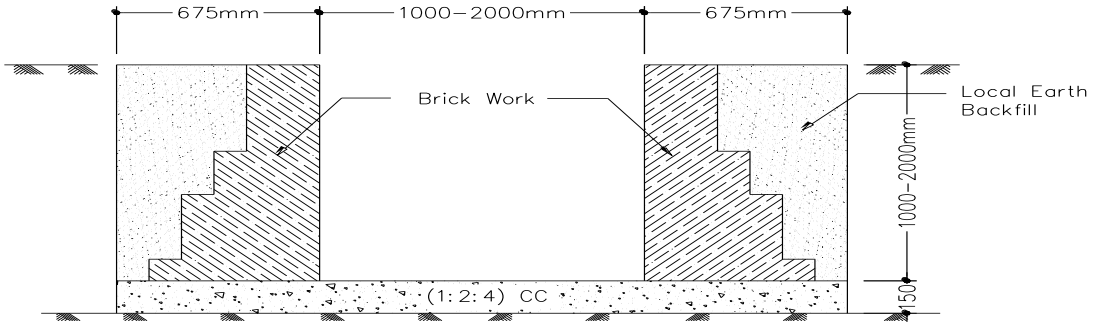
A schematic diagram showing the origin of Tertiary, Secondary and Primary drains and their destinations to the outfall river, presented above, are also presented here.



Schematic diagram of Tertiary, Secondary and Primary drains

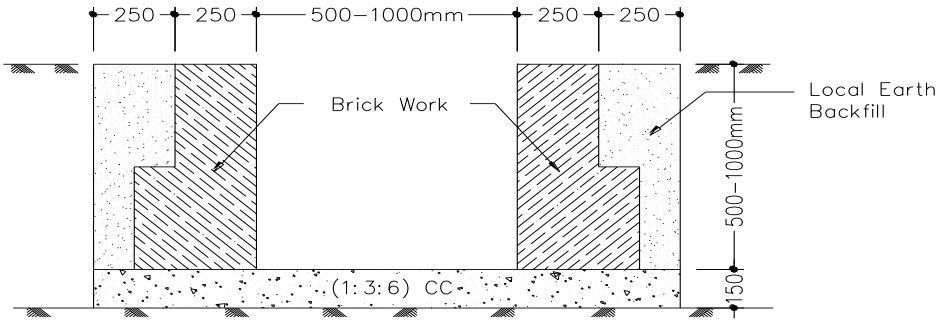
Secondary Drain: Secondary drains collect discharge from tertiary drains. One secondary drain may receive drainage discharges from several tertiary drains in its course. Size and

capacity of secondary drain is much bigger than tertiary drains; its catchment area is much bigger than tertiary drain. Like tertiary drain, it may run parallel to bigger roads. Secondary drains may run along and through the middle of its storm water contributing area. The typical cross-section, size and shape, and its construction material are shown below.



Typical Secondary Drain (Dimensions in mm)

Tertiary Drain: Tertiary drain carry run-off or storm water received from the above mentioned plot drains and block or Mohallah drains. Their catchment area or storm water contributing area is bigger than Mohallah drains. In most Paurashava areas it is difficult to find such naming or classifications. However, such classifications can be seen in references. Tertiary drains generally are the under jurisdiction of Paurashava. Those drains or drainage networks are constructed and maintained directly by the Paurashava. These drains are constructed by bricks, cement concrete and sometimes by excavating earth in their alignments. These drains may run parallel to road or across the catchments area. Sometimes borrow pits of the road serves as drains provided borrow pits are uniformly and continuously excavated. Borrow pits that serve as drains may be lined or channeled by brick works. Tertiary drains deliver its discharge usually to secondary drains. A typical tertiary drain is shown below.

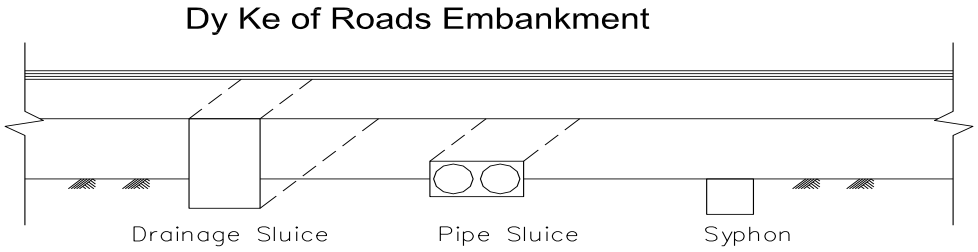


Typical Tertiary Drain (Dimensions in mm)

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

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

schematic view of drainage sluice, pipe sluice and siphon on embankment, which relieve drainage congestion presents below.



Rainfall is the source of storm drainage water irrespective of urban or rural catchments. Average annual rainfall in Kumarkhaliis about 2000mm. After infiltration, deep percolation and evaporation is about 50% of this rainfall water takes the form of drainage water for semi-urban and urban areas.

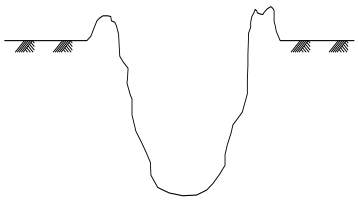
Sluice gates, Regulators and Navigation locks: These types of structures are provided on the flood control embankments. Sluice gates are functioning to vent out water from the countryside to the river. Flap gates are generally installed in the riverside so that river water cannot enter into the main land. On the other hand whenever the river water level becomes low and countryside water level is high, countryside water drains out through sluice.

Regulators also serve the similar purpose as sluice gates; however the size of regulators is much bigger than sluice gates. Regulators may have control gates in the countryside and in the riverside. Drainage of water to the river or flashing of water into countryside are possible by operating simultaneously countryside and riverside mechanical gates. Navigation lock sometimes is provided on the flood embankment to allow boat and ferry passages from the river and from the countryside. It is a simple structure with bigger chamber and large lift gates both at riverside and countryside. By operating these gates, boats and river crafts can be transferred from the river to countryside and vice versa.

Reservoirs: Large tanks, ponds, Dighis, lakes, etc. serve as immediate detention areas for storm water. Those structures are man-made and also natural; may be privately owned or government-owned or khas land. These structures function as drainage relief and source of water for emergency use, fisheries, duckeries, environment and nature preservation. For every mouza such reservoir is available. Physical feature survey maps and field survey maps (tank, pond and reservoir) show the existence of reservoirs and database shows their dimensions. Those structures should not be disturbed or removed by physical interventions by fillings or other means rather should be properly maintained and preserved.

Drainage Khals and Waterways: Khals and waterways are natural channels and act as drainage elements. In every mouza more or less such natural channel, khals and waterways carry the excess storm water to the connecting river lying further in the down

stream. Sometimes old and silted-up khals are re-excavated to improve drainage efficiency. Most of the natural khals carry the local storm water particularly runoff from the Mouza / Mouzas those it passes through. Khals are narrow and deep in cross-sections; on the other hand waterways are shallow and wider. Physical feature survey maps, field survey maps (river, khal / drainage) show the drainage khals and waterways and their database shows the dimensions. The sketches below show the sectional view of khals and waterways.



X-Sectional Sketch of Khal

X-Sectional Sketch of Waterways

12.2 Existing Drainage Network

12.2.1 Introduction

Existing drains in the Paurashava have not formed any network. Existing river, pond and ditches are trying to manage the drainage requirements. Lack of drainage network is causing water logging in the Paurashava area when it rains. All drainage networks require to be developed with primary, secondary and tertiary drains to mitigate the current water logging problem.

Further development of drain should follow the bulk density and construction is being proposed in the Drainage Plan. Length, width and depth of the drain have considered according to the density of population, road width and out falls. Slope of the drain should be maintained according to the slope of the area and the level of river water according to the seasons.

12.2.2 Existing Drainage System / Network

Drainage system of Kumarkhali Paurashava is being managed by a natural drainage system (composed mainly by a River. The river flows beside the Paurashava from the Western part. There are also numerous ponds in the Paurashava. Total length of that natural drainage network of the Paurashava is 4.77 km.

Drains

In Kumarkhali Paurashava total length of constructed pucca drain is 14.58 km. These drains are similar in terms of width, and depth. The existing drainage system of the project area has three distinct features and these are:

Road side pucca drainage network in the core part of Paurashava

Residential katcha drains

Natural drainage by rivers and khals

Primary Drain

Primary drains are mainly carry out the total water of a large area (it may be a single large neighborhood or a combination of neighborhoods) collected from secondary and tertiary drains to a large water body or beyond the Paurashava through an outlet. In Kumarkhali Paurashava a River mainly plays the role as the Primary drainage network. The River flows beside the Paurashava from the Western part. The total length of the river is 4.77 km within the Paurashava area. This river situated along Ward Nos. 3, 4, 5 and 9 with 198.37 acres of land.

Secondary Drain

No secondary drains found in Kumarkhali Paurashava.

Tertiary Drain

Tertiary drains are the smallest category of drains which mainly connect individual household/ unit to the secondary drains. In Kumarkhali Paurashava the core part of the Paurashava possesses some tertiary drains which mainly drain out water from the Bazaar area, Upazilla area and the core area. The other areas of the Paurashava have to depend upon the natural canals for storm or waste water to be drained out.

Coverage and length of different types of drains have been shown in the Table 12.4.

Table 12-4: Coverage of Different Types of Drain

Type of Drains	Categories (Man made/ Natural)	Network Coverage to the Paurashava	Total Length of the Drains	Average Width of the Drains (m)
Primary Drains	Natural	Ward Nos. 3, 4, 5 & 9	4.77 km	Greater than 12.00
Secondary Drains	-	-	-	-
Tertiary Drains	Man Made	Ward Nos. 1-9	14.58 km	0.30-0.60

Source: Physical Feature Survey by DDC, 2009-2010

Drainage network of Kumarkhali Paurashava has been shown in the Map 12.1.

Outfalls of the Drain

The River flowing along the western side of the Paurashava (Ward Nos. 3, 4, 5 and 9) is the main outfall of the drains for the Paurashava. After travelling through some path rain water and other waste water of the Paurashava outfalls into the River directly.

Ponds, Ditches, Beels, etc.

There is no major beels found in the project area. There are 198 ditches and 269 ponds found in the Paurashava covering an area of 157.38 acres which serve as retention ponds of excess runoff and household discharges.

Other Water Bodies

The project area is connected to the National River system through the Garai River. There is no canal in the Paurashava area. Other than these natural river and ponds various artificial/ constructed short depth water bodies are found in the Paurashava which are mainly used as pisciculture.

Map 12-1: Existing Drainage Network of Kumarkhali Paurashava

12.2.3 Analysis on Land Level Topographic Contour

The study area of Kumarkhali Paurashava has been surveyed with RTK-GPS/ DGPS and Total Station as per specification for spot interval given in the TOR. For this purpose, a total of 2343 spot values were collected for the study area. A contour line/contour joins points of equal elevation (height) above mean sea level. A contour map is a map illustrated with contour lines which shows 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 7.4 mPWD and the highest spot height is 13.99 mPWD. Around 42.1% of the spot heights are between 12.01-13.00 m and average height of land of the surveyed area is 12.40 m PWD. Details of Land Levels and spot value, maximum, minimum and average height of the study areaare shown in the Table 12.5 and Table 12.6 below:

Table 12-5: Spot Value and their Unit (Number of Spot (z) Value and their Statistics)

No.	Spot Unit	Value (meter)
1	Total Spot Number	2343
2	Average Spot Height	12.40
3	Maximum Height	13.99
4	Minimum Height	7.4
5	Standard Deviation	1.01

Source: Topographic Survey by DDC, 2009

Table 12-6: Spot Interval and Frequency

No.	Spot Interval	Spot Number (Frequency)	Percentage (%)
1	7.00 – 9.00	45	1.9
2	9.01 – 11.00	92	3.9
3	11.01 – 12.00	517	22.1
4	12.01 –13.00	986	42.1
5	>13.00	703	30.0
Total		2343	100.0

Source: Topographic Survey by DDC, 2009

A contour map for Kumarkhali Paurashava at 0.30m vertical interval was drawn using the spot levels surveyed roughly at 50m interval. Total conture number is 774 and average conture value is 12.14. A detail Contour Map of Kumarkhali Paurashava area is presented as Map 12.2. The detail of the summary of contour in Kumarkhali Paurashava is presented in the Table 12.7.

Table 12-7: Contour Derived from Spot Elevation

No.	Spot Unit	Value
1	Total Contour Number	774
2	Average Contour Value	12.14
3	Maximum Contour Height	13.8
4	Minimum Contour Height	7.8
5	Standard Deviation	1.02

Source: Topographic Survey by DDC, 2009

Map 12- 2**: Land Level of Kumarkhali Paurashava**

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

The Kumarkhali Paurashava has an average normal rainfall of 397.2 mm in the month of July which is highest among all other months. In September, it falls to 327.1 mm; again falling little bit to 229 mm in August. From November to March, this rainfall varies between 28.1 mm to 19.3 mm.

No peak hour run off storm water discharge is found. During rainy season, rain water is being drained through the man-made drains. All pucca drains are linked with the natural water bodies as an outfall. As a result, waters of the river and other water bodies are polluting through those discharging elements. The Garai Rivers is the outfall of all natural and man-made drained water.

12.3 Plan for Drainage Management and Flood Control

12.3.1 Plan for Drain Network Development

Drainage network in the Paurashava is mostly under govt. initiative. There is no well organized, well constructed drainage pattern / network encompassing all the Wards of the Paurashava. Whatever drainage network that exists is mostly constructed by the Paurashava authority. Drainage aspects plays a vital role in clearing waste water but the survey finds most of the drainage network unable to function due to poor maintenance, design, debris accumulations and faulty gradients. Drainage must receive image priority in Ward Action Plan as water logging within selected places of Paurashava is saver, therefore, planning options for drainage of the future Paurashava area including Water Development and Flood Control Projects, should be seriously pursued. The present inefficient drainage needs to be well designed encompassing all the Wards right from household level to main road. There is no drain for household storm waste. Existing open drains are being obstructed with rubbish and reduce the discharge facilities, creating health hazards.

12.3.1.1 Drain Network Plan

There is no natural canal in the Paurashava, So, there is a need to developa planned drainage network.The activity for the relevant authority will be assisted by the preparation of the drainage master plan for the Paurashava which details the necessary corridors, sizes and generalized locations for:

- Primary Drain
- Secondary and tertiary drain
- Storage ponds
- Silt traps
- River embankment

Initially, the Paurashava will encourage implementation of the first phase recommendation of the drainage master plan. A brief summary of the proposals to be undertaken in Phase-1 is given below. Reference should be made to the Map for identification of the drainage areas referred in the text.

Phase-1 (Storm water drainage)

- Improvements and the removal of obstacles from existing drainage areas and link up of the missing link of existing drainage. As per guideline of the **"Playfield, Open space, Park, Natural Water Reservoir Conservation Act, 2000"** conservation of all ditches and ponds above 0.25 acres for retaining the storm water**(Annexure-F).**
- Construction of new secondary and tertiary canals in drainage areas marked as in ward 2,3,4&7. The provision of flood control regulators in drainage areas marked as in the map.

Phase-2 (Rain water and household drainage)

- Construction of surface drain linked with the residences, may be covered or uncovered.
- Provide linkages with secondary and tertiary drains.
- Out-fall of such drains may be nearby low-lands and river.
- For discharging of rainwater from commercial areas, covered surface drain may be constructed and they will be linked with the secondary and tertiary canals.

12.3.1.2Proposal for Improvement of the Existing Drain Networks

A wider scope for construction of a drainage system may be provisioned in the Paurashava. At least central areas are open for such development immediately and other areas may be followed for projected period as designed in the plan. Except the core area the Paurashava has wide scope for imposing drainage system. The principles required for drainage plan are available in the area. Land slope, nearness of the natural drainage, sparse population density and soil condition are in favour of drainage construction.

Map 12-3: Proposed Drainage and Flood Control Components

Drainage corridors: If a drainage network has to be installed, the drainage originating throughout the Paurashava would be carried by means of surface drains and culverts. These should be accommodated within road reserves.

General location required: For sewerage treatment plant, large plot will be needed, preferably on outskirts of the Paurashava. For sewerage pumping station, small plots throughout the Paurashava will be needed and a system should be introduced.

Maintaining of land slope: Important component of the drainage network is land slope, which was not maintained during the construction of existing drains. The slope of the Paurashava is found towards north-west to south-east. Slope of all drains should maintain this direction.

12.3.1.3 List of Proposed New Drains

For the removal of existing drainage congestion and provisioning of effective drainage system, a planned drainage network has been proposed. which are shown in the map 12.3 shows. A number of new primary and secondary drains have been prescribed. In the Paurashava, existing length of the drain is 4.8 km. and about 69.63km drain is being added as a proposal of which 20.88km are primary drain,18.79km are secondary drain and 29.95 km are tertiary drain. All wards have been considered and in some places emphasize has given providing on missing links rather than new.he details of drainage proposal are shown in **Annexure-3.**

Table 12-8: List of proposed new drains

Type	Length (km)
Primary	20.88
Secondary	18.79
Tertiary	29.95
Total	69.63

12.3.1.4 List of Infrastructure Measures for Drainage and Flood Control Network

There are altogether1 bridges (RCC) and 39 culverts (RCC) in the Paurashava. Maximum numbers of bridges and culverts are found in the Ward Nos. 2, 5, 6, 7 & 8. Those bridges and culverts are located on the canals and drainage channels. The study area is flood prone area. Water logging is common, dyke is an important issue for this Paurashava, but there is no dyke or embankment in the Paurashava. No proposal for bridge and culvert has made it will proposed during preparing detail designing of drains and roads.

Table 12-9: List of existing and proposed infrastructures for drainage and flood control

Name of infrastructure	Existing (No.)	Proposed (No.)
Bridge	1	0
Culvert	39	0
Sluice Gate	0	0
Flood Wall	0	0
Road cum Embankment	0	0
Flood Embankment	0	0

12.4 Plan Implementation Strategies

12..4.1 Regulations to Implement the Drainage and Flood Plan

The regulations which will be needed for the implement of drainage and flood plan are:

1. Section 3 of the Acquisition and Requisition of Immovable Property Ordinance, 1982 is needed for acquisition of land in view to construct drainage and flood control components. The Water Development Board, according to the demand, will apply to the Deputy Commissioner for such acquisition.
2. Water Development Board Ordinance, 1976 delegate power to the Water Development Board for construction of embankment. To control intrusion of flood water and improvement of drainage facilities, the Board is empowered to take necessary actions according to the regulations prescribed in the Ordinance.
3. Irrigation Act, 1876 has prescribed regulations for the improvement of irrigation facilities through the improvement of drainage facilities in view to increase agriculture production. Deputy Commissioner may enforce any regulations prescribed in the Act necessary for irrigation facilities.
4. Canal and Drainage Act, 1872 has enacted for excavation of canal and removal of drainage congestion from agriculture land. The Deputy Commissioner may authorize any person, through a written approval, for excavation of canal in view to improve irrigation facilities for agriculture practices.
5. Public Health (Emergency Provision) Ordinance, 1944 has enacted for the improvement of drainage and sanitation facilities. Department of Public Health Engineering (DPHE) is authorized to enforce the regulations prescribed in the Ordinance. The government approves project for DPHE mostly for the improvement of drainage and sanitation facilities in urban areas.

12.4.2 Implementation, Monitoring, Evaluation and Coordination of the Plan

Implementation through Multi-Sectoral Investment Programme: Major infrastructure development works such as primary roads, water supply, drainage, etc., will largely be controlled by Government. Public works requires efficient co-ordination through the Multi-Sectoral Investment Programme (MSIP).

Objective of a Multi-Sectoral Investment Programme (MSIP) will match a list of the development projects with the funding stream necessary to implement them. There are two basic activities that would determine the contents of MSIP. One activity would be to prioritize and schedule the investment projects of all public agencies so they will collectively help to achieve the development goals and objectives of the Urban Area Plan. Second activity would be to analyze the source and availability of fund for the prioritized list of development projects.

Implementation through Action Plans and Projects: Action Plans and Projects will be the implementation plans to solve problems at the local level. Action plans will take a direct approach toward plan implementation with a minimum of research, reports or elaborate planning methods. These projects will be easily identifiable and will require minimum resource.

Implementation through Development Control: Landuse zoning is one of several methods of plan implementation to be considered. In all cases where some form of

development, landuse control may be applied; careful consideration requires the following ideologies:

- the purpose to be achieved by the development controls;
- where controls should be applied;
- what aspect of development needs to be controlled;
- what type of development controls are required;
- what degree or level of development control is required;
- who will be affected by the required control;
- who will be affected by the controls and in what manner;
- when the controls should be applied;
- what will be the likely impact of the controls;
- how and by whom will the controls be administered and enforced.

Development control as an instrument of plan implementation may be selectively applied within the Urban Area Plans. Development controls would also be varied in intensity and detail to suit the particular circumstances. It is important that they should be clear and easily understood by all parties concerned. Since the entire Paurashava Master Plan 'package' has become statutory, development controls associated with its component plans would also be statutory.

Implementation by Facilitating Private Investment: Another approach that would be taken by government toward plan implementation will be to guide and facilitate investments made by the private sector. Government can achieve this with relative ease and at very low cost by setting up a legal and operational framework, coupled with suitable incentives, to facilitate land consolidation, plot boundary readjustment, efficient lay out of plots and provision of local infrastructure by the private sector. The benefits of this approach would be:

- increased efficiently of the urban land market would make, more private land available to urban households;
- would pass much of the development costs for local infrastructure to the private sector and land market mechanisms;
- would increase in land for development without large cash outlays by government to purchase land for development schemes; and
- would keep provision of land for community facilities virtually no cost to government.

Plan Monitoring

The Urban Area Plan would simply be tools for guiding and encouraging the growth and development of an urban area in a preferred manner. In a rapidly changing urban environment, the Urban Area Plan would require to keep up to date. If this is not done, within a few years it will be obsolete. Therefore, it is imperative that the requirement for regular updating of the Urban Area Plan be made a legal requirement.

For implementation of the various programme components of the Urban Area Plan appropriate administrative measures will have to be undertaken. This will essentially

include project preparation and monitoring of their execution and evaluation. For carrying out all these activities appropriate institutional measures are also be needed.

Evaluation

Monitoring and evaluation of on going and implemented projects is essential to keep the future course of action on the right track. An on going project should be regularly monitored and handicaps identified to enable taking appropriate measures at the right time.

Post implementation evaluation is also needed to take appropriate measures correcting past errors-from project preparation to implementation.

The top level supervision has to be done by a high level supervisory committee headed by Paurashava Mayor, LGED representative and Local Government Ministry. Other members of the committee will be local Ward Councilors, local community leader/social workers and the Town Planner of the Paurashava. The committee will supervise implementation works regularly and issue necessary instructions to expedite the works of implementation.

Co-ordination

A Planning Section of Paurashava should have close interaction with the citizen of Paurashava at large in order to make people aware of the benefits of a good plan and, therefore, their social responsibility to promote plan implementation in one hand and also resist contraventions on the other. A specific interactive cell is recommended to operate in this regard with following responsibilities:

- Provide pre-application advice to residents, consultants and developers about landuse management issues and application procedures for the submission of development applications.
- Enforce planning and landuse management related legislation and zoning scheme regulations.
- Issue of property zoning certificates.
- Investigate and resolve landuse management complaints, illegal landuse and prosecuting contraventions.

Such interactive windows may be opened in various convenient locations to ensure ease of the answers to commonly asked questions may be shown in the internet. Besides, those may be shown in the print and electronic media time to time.

In spontaneous areas, while all out people's co-operation is needed for project implementation; there will also be some elements of negotiation. Negotiation will be particularly needed in case of road widening projects. It will be a crucial task for Paurashava to convince the affected people to give up their land for road use. Efforts should be made to convince the land owners on the ground of enhancement of property value due to road widening. In case people refuse to offer land free of cost necessary arrangements may have to be made for payment of compensation. This process of negotiation will be very critical, cumbersome and time consuming, and therefore, has to be handled with utmost care and patience. The best results can be accrued only by

wining people's confidence. In case the authority fails to get peoples co-operation they should exercise power of compulsory acquisition of land. Attempts may be made to engage NGOs / CBOs to work as catalysts in negotiation.

12.5 Environmental Management Plan

12.5.1 Introduction

The plan has documented Kumarkhali Paurashava area's environmental conditions, determines potentiality for present and past site contamination (e.g., hazardous substances, petroleum products and derivatives) and identifies potential vulnerabilities (to include occupational and environmental health risks).

12.5.2 Goals and Objectives

Based on the information and data on the air, water, noise, soil, drainage congestion, river erosion, garbage disposal and industrial and clinical wastes an effective and action oriented plan is required as prescribed in the ToR. Preparation of environmental management plan is the ultimate goal of this study.

12.5.3 Methodology and Approach to Planning

Environmental survey has conducted following the standard methods and procedures to determine environmental pollutions. Elements of pollutions of environment are air, water, land and noise for the development of urban areas. The Consultants have taken necessary assistance and information from the Paurashava Mayor, Councilors, Engineers and other concerned officials as well as the general inhabitants to determine pollution in air, water, land and noise. Based on the information and data collected from the field and secondary sources, detailed report has been prepared. Data collection format and questionnaire was approved by the PD of UTIDP, LGED. The data collection procedure incorporates discussion meeting with the Paurashava Mayor, Councilors and other Paurashava representatives. Discussions were also made with other GOs like DPHE, BADC, etc. and NGOs representatives working in the Paurashava.

12.6 Existing Environmental Condition

12.6.1 Introduction

The Paurashava is a part of greater Kushtia district. Some information has collected from secondary materials and they are on geology, soil and sub-soil condition, climate, temperature, humidity, rainfall, wind direction and hydrology. Other relevant information is being collected from field survey and they are mostly on the environment pollution. Those information presents sequentially in the following paragraphs.

12.6.2 Geo-morphology

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

In the Paurashava, sub-soils are being eroded naturally and the soil varies from place to place and composed of clay to fine sand from 0-40 ft depth, fine sand to very fine sand 40-160 ft, fine sand to medium sand 160-260 ft. Medium sand to coarse sand is available from 260 ft to 380 ft depth and in rest of the depth are hard clay, fine sand and coarse sand formed entirely by the deltaic action of the Ganges, which brought mud and limestone from Himalayas.

To a great extent, soil of the Paurashava is uniform in character. Only variation observed is in greater or smaller admixture of sand, silt and clay in grayish and dark gray colours. Along the riversides, it is found that the percentage of sand is higher and in the areas where deltaic action has ceased is lower. The load bearing capacity of this soil is very poor.

Soil types, strength and density characteristics based on Standard Penetration Test Values (N) have been mentioned for the different types of deposits at various depths.

Cohesive silt and clay layers having N-values less than 4 are very soft to soft and are not considered suitable to support any civil engineering structures without ground improvement. There are only a few areas near the waterfronts (of Garai Rivers) with such low N-values in the surface underlain by comparatively strong clay and sand soil strata. Sand layers with variable quantities of silt/clay having N-values less than 10 are considered very loose to loose. In a few locations such weak sandy layers occurred. They occurred usually in the surface layers.

The natural clay soils of investigated area can be divided into two major groups distinguished by their colours as under:

Red clay : Light brown to brick red and massive, containing ferruginous and calcareous nodules.

Mottled clay : Earthy grey with patches of orange, brown colour, massive and contains ferruginous and calcareous nodules.

Again, in the filled up areas (along the regional Highway, from Rajbari to Kushtia) there are mixtures of many coloured soils carried from different borrowing areas. Consistency of cohesive soil deposits (plastic silts and clays) and relative density of cohesion less soil deposits (non-plastic silts and sands) have been described in accordance with internationally accepted terms, which give approximate indication of strengths of the soil strata encountered at different depths.

Table 12-10: SPT N-Values

Consistency	SPT N-value	Allowable bearing Capacity (kPa)
Very soft	0–2	< 25
Soft	2–4	25–50
Medium	4–8	50–100
Stiff	4–15	100–200
Very stiff	15–30	200–400
Hard	> 30	> 400

For plastic silts and clays consistency terms like very soft, soft, medium stiff, stiff, very stiff and hard indicate the following approximate allowable bearing capacity of the different soil strata estimated on the basis of SPT N-values.

For cohesion less soil deposits (non-plastic silts and sands) relative density has been described with terms like very loose, loose, medium dense, dense and very dense on the basis of SPT N-values measured in the different cohesion less soils strata encountered within the explored depth of 15m. These relative density terms give the following approximate strength characteristics based on SPT N-values.

Table 12-11: Strength Characteristics

Relative Density	SPT N-Value	Estimated Shearing Angles	Strength Characteristics
Very loose	> 4	28°	Very poor
Loose	4–10	30°	Poor to fair
Medium dense	10–30	32°	Fair to good
Dense and Very dense	> 30	34°	Good to excellent

Climate
The Paurashava belongs to a sub-tropical monsoon climate region. There are six seasons out of which Summer, Winter and Monsoon are the prominent season. Winter starts at November and ends in February. Monsoon period is between July to October.

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

Humidity
The least humid months in the North- eastern areas of Bangladesh are January to March (approx. 60 % relative humidity). In Kumarkhali Paurashava the rate of humidity is less during January to March compare to other months of a year (According to Meteorological Department). Thereafter from June through October the hot and wet monsoon season prevails with southwestern winds that bring heavy rainfall, very high relative humidity (> 80 %).

Rainfall
The Kumarkhali Paurashava has an average normal rainfall of 397.2 mm in the month of July which is highest among all other months. In September, it falls to 327.1 mm; again falling little bit to 229 mm in August. From November to March, this rainfall varies between 28.1 mm to 19.3 mm.

Wind Directions
A cool dry, almost cloudless season from November through February with north-eastern monsoon winds is followed by a transition period, namely the pre-monsoon hot season

that comes along with changing wind directions, thunderstorms, and increasing cloud cover from March through May in Kumarkhali of Jessore District. Single rain events in March, April and May might be the characteristic thunderstorms of the hot dry season. The Monsoon season started at the end of May and lasted until end of October.

Hydrology

The physiographic situation of the Paurashava is characterized by high land all over the Paurashava. There is a river and two khals situated on Northern and Southern side respectively functioning as main drains in the Paurashava. These are two natural drainage systems in the Paurashava. Important features affecting hydrology of the Paurashava are the great amount of rainfall which resulted in water logging and flooding during monsoon period in most of the wards in the Paurashava.

12.6.3 Solid Waste and Garbage disposal

Household Waste

There is no solid waste management system found in Kumarkhali Paurashava. The people of this Paurashava are not habituated in dumping their garbage and kitchen waste in dustbins. Instead they dump their waste in road side drains, opens space or roads adjacent to their houses. The Paurashava has no solid waste disposal site of its own. It normally dumps the solid waste into low lying areas and canals. Total population of Kumarkhali Paurashava will be 27097 (projected) during the year 2031. Total daily generation of solid waste from Kumarkhali Paurashava is estimated to be 6.77 Metric Tones (considering a generation rate of 0.25 kg/person/day) (Source: WasteConcern, 2008). So several Waste Transfer Stations and one proper Waste Disposal site have to provided for ensuring proper management of solid wastes in the Paurashava area.

Industrial Waste

There are many textile industries and few tobacco industries found in the Kumarkhali Paurashava. Except, Textile mill, Saw mill, Rice mill and Handloom factories which are mostly run by private sector, there is no large scale industries like Sugar, Sericulture, etc. Also, Paurashava has a designated basic industrial estate which is Textile mill. Kumarkhali is an important center of the Bangladesh Handloom Board. About one hundred automated textile manufacturing units are located here. The Upazila is rich in cottage industries especially in handloom, weaving and pottery.It is found that those establishments have problems and potentialities. Careful consideration will help to resolve those problems and adoption of necessary policy initiatives will help to flourish the existing units and draw more investors and entrepreneurs to set up new manufacturing industries, which will be based mainly on local agro-products.No industrial waste available in the Paurashava.

Kitchen Market Waste

Kitchen market waste is being dumped on the low lands available around the market.

Clinical / Hospital Waste

There is no arrangement for clinical waste management in the Paurashava. The clinics and hospital used to dump solid wastes here and there or nearby ditches. This activity may bring serious health hazard to the inhabitants specially the nearby dwellers.

Waste Management System

Kumarkhali Paurashava has a conservancy department to manage the solid waste management system like many other Paurashavas of Bangladesh, but there is few dustbin found in this Paurashava. It was reported and proved that, the authority did not maintain formal dumping system. Wastes are dumped where it is generated. The Paurashava authority could not ensure the prohibition of waste dumping station. People are used to manage their household generated solid wastes either with their own efforts or through out here and there.

The conservancy department of Kumarkhali Paurashava has only 3 garbage truck and few vans for solid waste management which is too poor to manage the whole system properly. The municipal authority could not take any measures to prohibit its inhabitant from indiscriminate dumping of solid wastes into the canals which results in blocking of drainage system.

Solid waste from the point of generation to the final disposal can be grouped into three functioned elements -

- Waste generation and storage
- Collection
- Final disposal

Waste Generation and storage: Households within the area are producing 1.00 tons of domestic solid wastes per day.

Collection: The waste collection is done in the following three stages:

- The residents themselves take domestic refuses from households to the intermediate dumping points.
- Street and drain wastes are collected and dumped at intermediate disposal points by the municipal sweepers and cleaners.
- Final collection from the intermediate points and its disposal to the dumping yard by the conservancy worker.

Final disposal: The authority used to dump in low lands on the basis of land owner's interest or nearest ditches.

Latrine

Toilet system of the study area is mostly categorized as pucca and katcha. In spite of this, Paurashava has a modest development of pucca toilets in government zones. Sewerage system has not been introduced on a trial basis as to their popularity and acceptance. Ownership of toilets varies widely in most of the Wards. Most of the households have their own toilets and at the same time there is joint toilets found in slum areas. Sanitary

toilets or pucca toilets are comparatively good in all the Wards. Only 9% katcha toilet is found in the Paurashava and owner of those toilets are poor people.

12.6.4 Brick Field

No brickfield is in the Paurashava premises.

12.6.5 Fertilizer and Other Chemical Use

The fertilizer and chemical uses in the agriculture field for increasing agriculture production are Urea, Potash, Gypsum and Nitrogen Sulphate, Bashudin, Diazinon, Sumithion and Padan. Those chemicals are being contaminated with the surface water and create water pollution. Those chemicals and insecticides are creating water pollution of the Gorai Rivers. For more details Chapter-8 of the Structure Plan (Environmental Issues in Agriculture Practice).

12.6.6 Pollutions

Pollution situation prevailing in Kumarkhali Paurashava has been discussed below:

AIR

The main sources of air pollution in this Paurashava are emission of harmful gaseous matters from vehicles. Dumping of garbage to open land and ditches make objectionable odor. Besides, industrial operations of flour mills, oil mill, engineering workshop, saw mills, husking mills in Paurashava area are the sources of air pollution to some extent.

Any types of pollution are harmful for human health depending on the nature of pollutant, concentration, duration of exposure and the state of health and age group of the recipient. Polluted air may cause respiratory problem, asthma, bronchitis, headache and dizziness, nasal congestion, renal damage etc.

WATER

Water borne diseases spread out due to the use of polluted water. Water pollution is also another threat of environment of Kumarkhali Paurashava. Surface water is being contaminated from improper sanitation, indiscriminate dumping of domestic solid waste disposal and clinical wastes into the water bodies, and use of chemicals (fertilizers and insecticides) etc. Most of the respondents identified presence of iron beyond acceptable limit is the reason for ground water pollution in Kumarkhali Paurashava. Ground water is mainly used as drinking water and if it is treated for iron removal may lead chronic intestinal diseases of the inhabitants of the Paurashva leading to increase in their health care expenditure.

Hospitals in Kumarkhali Paurashava are producing bacteriological contaminated wastes. A portion of the wastes are dumped into the open drains and canals beside roads which is one of reasons of surface water pollution. Farmers use fertilizers and pesticides in agricultural land. During rainy season it comes in contact with water and as a result pollutes natural water system. No quantified information regarding ground pollution is yet available for Kumarkhali Paurashava.

Land

Land pollution in Kumarkhali Paurashava is significantly low at present situation. Significant number of the respondents claimed to have minimal land pollution in the Paurashava. Most of the respondents said that majority of the existing land pollution occurs due to improper management of domestic wastes disposal. Discharge of industrial wastes and use of chemical fertilizers and pesticides do not have any significant contribution to land pollution of the study area.

Noise

Major concern regarding noise pollution in Kumarkhali Paurashava is due to movement of thousands of vehicular traffics through the regional road passing through the Paurashava area. Areas adjacent to both sides of Rajbari to Kushtia Road and Bazar Road are affected by vehicular noise pollution. Moreover, high concentration of commercial activities in the main bazaar area is also responsible for noise pollution.

12.6.7 Natural Calamities and Localized Hazards

12.6.7.1Cyclone

A disaster is the tragedy of a natural or human-made hazard (a hazard is a situation which poses a level of threat to life, health, property or environment) that negatively affects society or environment. Disaster can be classified into two categories: natural disaster and man-made disaster. A natural disaster is the effect of a natural hazard (e.g. flood, volcanic eruption, earthquake or landslide) that affects the environment and leads to financial, environmental or human losses. Man-made disasters are disasters resulting from an element of human intent, negligence, or error, or involving a failure of a man-made system.

The Paurashava area including the KumarkhaliUpazila has affected by the several major natural disasters ranging from Cyclone, Flood to Water-logging and Draughts, etc. The periods of those disasters are 1998, 2000, 2004 and 2008. Very scanty attempt has been made by government to rehabilitate people after the natural disaster.

Urbanization is taking the lands of other uses to residential use. For this purpose agricultural lands and water bodies are being chosen most frequently and the lands are being converted into urban settlement. In Kumarkhali Paurashava, wet lands are filled up and agricultural lands are converted. This has been identified as the major man-made disaster accelerating the degree of conversion year to year. Use of poisonous insecticides on the agricultural land is another man made disaster which will affect in the long run.

River Erosion

Paurashava has a river of secondary importance and a natural khal which has silted up a lot. The River do not function well due to large siltation problem.

Flood

Inundation has been measured within Paurashava on plinth and above plinth level. Two level of inundation creates following types of damages. When flood reaches plinth level

and above plinth level the crop loss occurs in most of the Wards. The Paurashava was not affected by recent flood.

Earth Quake
The Paurashava is not in earth quake zone.

Water-Logging
Water logging occurs in the Paurashava during the Rainy season (June-September). Mainly encroachment to natural canal is responsible for this problem. The natural canal is mostly encroached, canal bed filled up or lack of maintenance, is the causes of water logging.

Fire Hazard
No fire hazard record is found in the Kumarkhali Paurashava. With the increase of population, chances of fire incidence may increase for offices, institutions, market places and industries. Electric short-circuit is mainly responsible for fire hazards in urban area. Human error may also cause incidence of fire hazard sometimes.

Other Hazards
Urbanization is taking the lands of other uses to residential use. For this purpose agricultural lands and water bodies are being chosen most frequently and the lands are being converted into urban settlement. In Kumarkhali Paurashava, wet lands are filled up and agricultural lands are converted. This has been identified as the major man-made disaster accelerating the degree of conversion year to year. Use of poisonous insecticides on the agricultural land is another man made disaster which will affect in the long run.

12.7 Plan for Environmental Management and Pollution Control

12.7.1 Proposals for Environmental Issues

In Kumarkhali Paurashava, noise pollution is occurring from saw mills and rice husking mills.. Air pollution is caused by dust emitted from saw mill, rice hushing mills and furniture shops. Also flood water and water-logging are creating health hazards. Dysentery, diarrhea, etc. diseases occurs due to Water logging. These above varies are extremely important uses of concern for the Paurashava. Pragmatic planning / solution and proper Drainage Master Plan are very pertinent issues which will be of utmost importance in planning the Kumarkhali Paurashava.

However, implementation of activities like roads, drainage, bridge / culverts, housing and industrial establishments and bazars will radically change the natural topography and landuse pattern. The agricultural land will be converted into urban and semi-urban area. Existing scenic beauty will disappear; water bodies will lost and general slope will be diminished for earth filling due to urbanization. Therefore, in the process of preparation of Master Plan, Structure Plan and Ward Action Plan, consideration of those factors will be made for keeping the natural environment.

For a better living environment above environmental phenomenon should be considered with the systematic planning principles and regulatory measures. With these views, people's awareness should be increased about the fair living environment through

different public activities. Arrangement of landuses should be provisioned for all the public and private organizations as their necessities.

12.7.1.1 Solid Waste Management Plan

Solid waste management is a crucial problem for the Paurashava. The Kumarkhali Paurashava does not have the sufficient capability to handle the huge waste generated by the residents due to narrowness of roads, lack of local collection sites stand as impediments to waste management. Particularly in informal/spontaneous areas due to existence of narrow roads the garbage trucks can not enter for removal and transshipment of the garbage. In most places there is no road side open space for locating garbage bins. Garbage is often found to be disposed off on low lands. As a result rotten garbage spoils the local environment of the area posing health hazard of the local residents. No dustbin is in the Paurashava whereas the daily waste produced is about 1.00 tons and most of those garbages throw to the nearby low lands.A 1.64 acre dumping site was proposed near Rajbari-Kushtia Highway at ward no 9 of the Paurashava.

For an efficient solid waste management system, it is recommended to engage, CBOs, NGOs and micro enterprises on contract basis for collection and disposal of solid waste and street sweeping.

12.7.1.2Open space, Wet-land and Relevant Features Protection Plan

- One central park cum stadium at 8.17 acres, 4 neighbourhood parks has been proposed for this area. Stadium and the areas for tourism development are prescribed in the extended areas.
- The authority named Bangladesh Sports Council in collaboration with the Paurashava authority may construct the stadium. The stadium should use regularly with various programs.
- The land prescribed for tourism development, Bangladesh Parjatan Corporation should be the responsible authority to implement those tourism components. Domestic tourists should be emphasized rather than international in considering establishment of tourism components. Rainwater harvesting will be the major component of this tourism site. This sector can improve economic capability of the Paurashava dwellers rapidly.

12.7.1.3 Pollution Protection Proposals

Industrial / Brickfield

Industries are located in nine Wards and those are of different types like Brickfield, Saw mill, Husking mill and Oil mill. It is found that those establishments have problems and potentialities. Careful consideration will help to resolve those problems and adoption of necessary policy initiatives will help to flourish the existing units and draw more investors and entrepreneurs to set up new manufacturing industries, which will be based mainly on local agro-products.

- All the industries are in mixed-use areas. Some of them will be re-arranged and shifted to the proposed industrial site.

- A green buffer will create around the proposed industrial site; it will separate the area from adjacent landuses and at the same time, environment will be livable.
- In future, the proposed industrial site will also be identified as a site for polluting industry (as identified by the Directorate of Environment). In that, provision of recycling plant should be attached with the individual industry.
- Any brickfield should not be allowed in the Paurashava jurisdiction.

Air / Water / Land / Sound

For a better living environment above environmental phenomenon should be considered with the systematic planning principles and regulatory measures. With these views, people's awareness should be increased about the fair living environment through different public activities. Arrangement of landuses should be provisioned for all the public and private organizations as their necessities.

The Paurashava is rural based urban area. River and ponds and other water bodies still below the danger level of pollution. Let it should not be increased. Still people awareness is possible for reducing contamination of ground water. People may aware about the use of pesticides in agriculture field, solid waste disposal in a systematic manner and improved sanitation facilities.

Other Pollution

At present, control of urbanization and dumping of clinical wastes are the major concern of environment pollution of the Paurashava. Controlled urbanization according to this plan may remove the pollution through urbanization. Control on area / use density, height density and bulk density are the means of pollution protection through urbanization. A specific site within the compound of health services should be provisioned, thus pollution through clinical wastes will be controlled.

12.8 Natural Calamities and Regular Hazard Mitigation Proposals

12.8.1 Protection Plans Addressing Natural Calamities

Change in Topography and Mitigation: The main ground slope of the study area is northeast to southwest direction. Natural topography of the Paurashava has already been changed for urbanization. Implementation of Master Plan activities like roads, drainage, bridge/ culvert, housing and industrial estates, bazars and growth centers will radically change the natural topography and landuse pattern of the study area. Agricultural area will be converted into urban and semi-urban area. Present green scenic beauty will disappear, water bodies will be lost and general slope will be diminished for earth filling due to urbanization.

1. Careful planning will be needed to minimize the change of topography.
2. Avoid water bodies during planning of roads, housing and industrial estates.
3. Practice good architectural/engineering design during planning of housing estates, buildings and the intersections of main roads.
4. Enhancement of plantation and gardening to increase the scenic beauty of the Paurashava.
5. Preserve the Beels with demarking buffer distance.

Landuse Change and Mitigation: Major portion of the study area is rural setup, with predominance of agricultural landuse. However, urban and semi-urban landuses are observed in the Paurashava and its surrounding areas. With implementation of the Master Plan, rural setup and agricultural landuse pattern will be changed radically into urban landuse type.

1. Keep water bodies and productive agricultural land free from urban development as long as possible. Vertical development may be encouraged rather than horizontal.
2. Careful planning is necessary to reduce change of agricultural landuse and rural setup.
3. Economic use of land should be emphasized.

Drainage Congestion and Mitigation: Drainage congestion may increase further with urban sprawl development. Faulty design, solid waste and rubbish dumping, encroachment and un-authorized structures, siltation, lack of renovation and re-excavation are the main causes of drainage congestion. Drainage system that exists in the study area is not well enough to carry the surface run-off properly. The outlets of these drainage networks are mostly connected with nearest water body. These water body is filling up, as a result, drainage congestion generates. And thus many areas are subjected to water logging during the heavy rainfall causing inconvenience to the people of the area.

1. Make proper drainage network in new area considering the slope and local topographical condition.
2. Remove all unauthorized structures, which developed on drainage structures.
3. Prohibit the people in dumping of rubbish and solid waste in drain.
4. Regular cleaning and maintenance by the concerned authorities.
5. Demarcation of water bodies, which can act as retention pond to avoid water logging from heavy rainfall.

Groundwater Table Declination and Mitigation: Fall of groundwater table is a common phenomenon in the study area during dry period (February-May). With expansion of urbanization and industrialization through the Ward Action Plan, the groundwater table may further fall if present tradition of using groundwater is continued.

1. Introduce rainwater harvesting system and use in the study area.
2. Stop land filling of ponds and water bodies to maintain the groundwater level through recharge and leaching process.

Groundwater Pollution and Mitigation: Groundwater pollution due to manganese, iron and hardness is a major problem of the study area. With expansion of urban area, more dependency on groundwater sources may increase the pollution level of sub-surface water.

1. Use surface water of Gorai Rivers for supply water.
2. Introduce rainwater-harvesting system.
3. Reduce dependency on groundwater.
4. Preserve surface water in ponds, khals, Beels, ditches and rivers for irrigation.

Noise Pollution and Mitigation: Although there is no data available on noise pollution of the study area, however, it seems that present noise level does not exceed the Bangladesh Standard. More noisy area may be the Bus Terminal area and Industrial and Market area. Hydraulic horn of buses and rickshaw bells are the main noise sources in the study area. However, some noises also generate during piling and construction works. Besides, welding workshops saw mills, musical instruments and blacksmiths are also common sources of noise pollution in urban areas. With expansion of urban area, the noise pollution will be increased for increasing number of motor vehicles, market places, industries, etc.

1. Stop using hydraulic horn in buses, trucks and other motor vehicles.
2. Declare some areas like hospitals, schools, parks, etc. as silent zone.
3. Control abnormally high noise from saw mill, old machines should be repaired or replaced.
4. Foundation of machines should be specially prepared to reduce noise.
5. Special type of silencer may be attached with the machines to reduce noise.
6. Welding and blacksmith workshops can be fenced with glasses to protect the passersby from possible pollution effects.
7. People constantly working in welding and blacksmith workshops should wear earplugs and glasses. Regular medical checkups can be carried out to identify possible health problems.

Air Pollution and Mitigation: Present climatic condition of the study area is sub-tropical monsoon. With the implementation of Master Plan this climatic condition is expected to continue if further global climatic change does not occur. However, rainfall may slightly decrease in the study area for cutting of trees and diminishing of green vegetation for urban development. Trees and green vegetation keep environment cool and enhance precipitation and rainfall. Temperature may remain same as present. Urban development keeping vegetation, plants, water bodies and new social forestation in homesteads, educational organizations, roads, embankment and parks will help maintain the climatic condition same as present.

Air-pollution is not a serious problem in the study area. Vehicular emission is also insignificant in the area. Industries are the main sources of air pollution. However, the air pollution will be increased in near future with increase of motor vehicles and industries. With the implementation of Master Plan more industrial zones will be developed which will also induce air pollution in the study area.

1. Use catalytic converter in buses, trucks, taxis and tempos.
2. Use CNG instead of petrol and diesel.
3. Impose ban on movement of sand carrying trucks and conservancy vehicles during office period.

Loss of Biodiversity and Mitigation: Urbanization like roads, infrastructure development, housing, commercial places, industrialization, etc. will replace the existing natural green environment to man made environment. Trees will be cut down, water bodies will be

filled up and polluted; sugarcane, paddy, banana, papaya and vegetable production will be reduced and mango garden and bush will disappear for urban expansion in new area. Wild animals, birds and fishes will lose their habitats and as a result a big loss of biodiversity will happen for urban expansion.

1. Avoid critical ecological area and refugee sites from development activities.
2. Aware people for keeping some trees and bushes around the homesteads.
3. Increase tree plantation in roadsides and homesteads.
4. Preserve the Beels for aquatic birds and fishes and some bush areas as wildlife preservation sites.

Parasitic Diseases and Mitigation: Parasitic diseases like dengue, malaria and filaria are not common in the project area. However, with the expansion of urban area, the prevalence of these diseases may increase in the project area. During last 3 to 4 years, the country faces dengue problem although this problem was negligible. This problem may happen also in the Paurashava for increasing urbanization and industrialization.

1. Regular mosquito eradication program in the project area.
2. Dengue carrying mosquitoes live in fresh water of tire, cans, bottles and flower tubs. Segregation of old tires; cans and bottles are required before dumping.
3. Remove additional water of flower-tubs and refrigerator cans regularly.
4. Improve drainage system and remove waterlogged areas in the project.
5. Regular cleaning of drain and removal of water hyacinth and other aquatic plants are required from ponds, ditches, khals and Beels.
6. Use mosquito net during sleeping at both night and daytime.
7. Increase people's awareness on parasitic diseases and mosquito control.

12.8.2 Protection Plan Addressing Regular Hazards

- Most of the natural canals and water courses will be preserved and maintained. The ponds larger than 0.25 acres should be preserved as a water reservoir.
- To protect northern and southern part from annual flood, a road cum embankment including two sluice gates will be needed and these will be controlled by the Water Development Board.
- For the removal of drainage congestion, sufficient number of bridges and culverts should be provisioned during construction of roads.
- Indiscriminate land filling for expansion and construction of residential areas and buildings should be controlled with the imposition of agriculture policy.

12.8.3 Protection Plan Addressing Encroachment and Other relevant issues

- As a measure of protection from encroachment restrictive buffer zone will be created on both sides of natural canals, rivers and other watercourses (if necessary). Walkways and plantation will be needed for the protection of those buffer zones.
- Formation of appropriate legislation on solid waste management will be necessary. People encroaches canal and river through dumping of solid wastes. Encroachment on road, canal and river should be removed as early as possible with the formation of

joined collaboration committee. This committee may be formed with the members from Paurashava, LGED, RHD and WDB.

- Using of waste as an unutilized resource and assisting in recycling of waste for conservation of resources and protection of environment.
- Introduces environmental education especially sanitary habits in school curriculum.

12.9 Plan Implementation Strategies

12.9.1 Regulations to Implement the Drainage and Flood Plan

The regulations which will be needed for the implement of drainage and flood plan are:

1. Section 3 of the **Acquisition and Requisition of Immovable Property Ordinance, 1982** is needed for acquisition of land in view to construct environmental components. The authority, according to the demand, will apply to the Deputy Commissioner for such acquisition.
2. Section 4 of the **Conservation of Environment Act, 1995**have prescribed duties and responsibilities of the Director. Most of those responsibilities are on the control of pollution.
3. Section 5 of the **Playfield, Open space, Garden and Natural Tank in Urban Areas Preservation Act, 2000** will be needed for the preservation of playfield, garden, open space and natural tank of the Paurashava.
4. Section 28 (1, 2 and 3) of the **Forest Act, 1927** has prescribed regulations on village forest, which is necessary for the formation of village / Paurashava forest.
5. **Water Hyacinth Act, 1936** was enacted for preventing the spread of water hyacinth in Bangladesh and for its destruction. It is said in the section 5 that, no person shall grow or cultivate water hyacinth in any garden or in any ornamental water or receptacle. Again, according to the section 8(1) said, with a view to facilitating the discovery or destruction of water hyacinth, an Authorized Officer may, subject to any rules made under this Act, by a notice served in the prescribed manner, direct an occupier of any land, premises or water within a notified area to cause-

(a) any branches of trees or shrubs on any such land or premises which overhang the edge of any river, stream, waterway, ditch, marsh, bil, lake, tank, pond, pool or pit to be cut back and any undergrowth or jungle thereon to be removed from such edge, within a distance specified in the notice, or

(b) any vegetation appearing above the surface of any such water to be removed from the water, within such period as may be specified in the notice.

6. Section 7 of the **Water Resources Planning Ordinance, 1992** will be needed for the development of water resources available in the Paurashava.

12.9.2 Implementation, Monitoring, Evaluation and Coordination of the Plan

Implementation through Multi-Sectoral Investment Programme: Major infrastructure development works such as primary roads, water supply, drainage, etc., will largely be controlled by the Government. Public works requires efficient co-ordination through the Multi-Sectoral Investment Programme (MSIP).

Objective of a Multi-Sectoral Investment Programme (MSIP) will match a list of the development projects with the funding stream necessary to implement them. There are

two basic activities that would determine the contents of MSIP. One activity would be to prioritize and schedule the investment projects of all public agencies so they will collectively help to achieve the development goals and objectives of the Urban Area Plan. Second activity would be to analyze the source and availability of fund for the prioritized list of development projects.

Implementation through Action Plans and Projects: Action Plans and Projects will be the implementation plans to solve problems at the local level. Action plans will take a direct approach toward plan implementation with a minimum of research, reports or elaborate planning methods. These projects will be easily identifiable and will require minimum resource.

Implementation through Development Control: Landuse zoning is one of several methods of plan implementation to be considered. In all cases where some form of development, landuse control may be applied; careful consideration requires the following ideologies:

- the purpose to be achieved by the development controls;
- where controls should be applied;
- what aspect of development needs to be controlled;
- what type of development controls are required;
- what degree or level of development control is required;
- who will be affected by the required control;
- who will be affected by the controls and in what manner;
- when the controls should be applied;
- what will be the likely impact of the controls;
- how and by whom will the controls be administered and enforced.

Development control as an instrument of plan implementation may be selectively applied within the Urban Area Plans. Development controls would also be varied in intensity and detail to suit the particular circumstances. It is important that they should be clear and easily understood by all parties concerned. Since the entire Paurashava Master Plan 'package' has become statutory, development controls associated with its component plans would also be statutory.

Implementation by Facilitating Private Investment: Another approach that would be taken by government toward plan implementation will be to guide and facilitate investments made by the private sector. Government can achieve this with relative ease and at very low cost by setting up a legal and operational framework, coupled with suitable incentives, to facilitate land consolidation, plot boundary readjustment, efficient lay out of plots and provision of local infrastructure by the private sector. The benefits of this approach would be:

- increased efficiently of the urban land market would make, more private land available to urban households;

- would pass much of the development costs for local infrastructure to the private sector and land market mechanisms;
- would increase in land for development without large cash outlays by government to purchase land for development schemes; and
- would keep provision of land for community facilities virtually no cost to government.

Plan Monitoring

The Urban Area Plan would simply be tools for guiding and encouraging the growth and development of an urban area in a preferred manner. In a rapidly changing urban environment, the Urban Area Plan would require to keep up to date. If this is not done, within a few years it will be obsolete. Therefore, it is imperative that the requirement for regular updating of the Urban Area Plan be made a legal requirement.

For implementation of the various programme components of the Urban Area Plan appropriate administrative measures will have to be undertaken. This will essentially include project preparation and monitoring of their execution and evaluation. For carrying out all these activities appropriate institutional measures are also be needed.

Evaluation

Monitoring and evaluation of on going and implemented projects is essential to keep the future course of action on the right track. An on going project should be regularly monitored and handicaps identified to enable taking appropriate measures at the right time.

Post implementation evaluation is also needed to take appropriate measures correcting past errors-from project preparation to implementation.

The top level supervision has to be done by a high level supervisory committee headed by Paurashava Mayor, LGED representative and Local Government Ministry. Other members of the committee will be local Ward Councilors, local community leader/social workers and the Town Planner of the Paurashava. The committee will supervise implementation works regularly and issue necessary instructions to expedite the works of implementation.

Co-ordination

A Planning Section of Paurashava should have close interaction with the citizen of Paurashava at large in order to make people aware of the benefits of a good plan and, therefore, their social responsibility to promote plan implementation in one hand and also resist contraventions on the other. A specific interactive cell is recommended to operate in this regard with following responsibilities:

- Provide pre-application advice to residents, consultants and developers about landuse management issues and application procedures for the submission of development applications.
- Enforce planning and landuse management related legislation and zoning scheme regulations.
- Issue of property zoning certificates.

- Investigate and resolve landuse management complaints, illegal landuse and prosecuting contraventions.

Such interactive windows may be opened in various convenient locations to ensure ease of the answers to commonly asked questions may be shown in the internet. Besides, those may be shown in the print and electronic media time to time.

In spontaneous areas, while all out people's co-operation is needed for project implementation; there will also be some elements of negotiation. Negotiation will be particularly needed in case of road widening projects. It will be a crucial task for Paurashava to convince the affected people to give up their land for road use. Efforts should be made to convince the land owners on the ground of enhancement of property value due to road widening. In case people refuse to offer land free of cost necessary arrangements may have to be made for payment of compensation. This process of negotiation will be very critical, cumbersome and time consuming, and therefore, has to be handled with utmost care and patience. The best results can be accrued only by wining people's confidence. In case the authority fails to get peoples co-operation they should exercise power of compulsory acquisition of land. Attempts may be made to engage NGOs / CBOs to work as catalysts in negotiation.

CHAPTER-13

PLAN FOR URBAN SERVICES

13.1 Introduction

13.1.1 Introduction

Sensible urban planning is critical to the healthy growth of cities. Unplanned growth leads a number of problems, creating misery for urban dwellers and making remedying of those difficulties. Yet flawed urban planning is little better, or perhaps worse, than no urban planning at all. It is thus important, when taking on such an enormous task as the drafting of an Urban Area Plan for a Paurashava, to ensure that the plan is well considered and likely to be conducive to good health and well-being of the urban dwellers.

During the year 1984 to 2003, Urban Development Directorate (UDD) was prepared a series of Landuse / Master Plans for Upazila and Zila Shahars of Bangladesh as a part of decentralization effort of the government. Under that project, the KumarkhaliUpazila Shahar was planned but the project area considered in the plan was far away from the planning area considered in the Paurashava Town Infrastructure Development Project.

No strategies were included in that plan. Objectives of the Landuse / Master Plan was -

- To support local and sectoral agencies plan making effort.
- To rearrange existing population within the Upazila premises.
- To provide basic urban services to the Upazila Shahar.
- To provide administrative services to the doorsteps of the Upazila people.

Components of the plan were –

- Preparation of Landuse / Master Plan for the Upazila Shahar based on certain approaches, concepts and principles.
- Preparation of road and urban services development plan
- Preparation of a drainage plan.
- Proposal for future educational, social and other service facilities.
- Reservation of land as urban deferred for future requirements.
- Phasing and implementation procedure of the plan.

However, none of the plans prepared by the UDD was implemented. This is because UDD was responsible only for preparation of the plan. Absence of Gazette Notification in favour of those plans and no understanding of the concerned Upazila about the plan were the major problems of non-implementation of those plans.

The UDD was undertaken the tasks without well thought pre-project thinking about how and who will implement the plan prepared by the UDD. Quality of the plan was not pragmatic and directly implementable. In most Upazilas, no local government authorities

to become the custodian of the plan and take care of the implementation and follow-up actions. There was no resource mobilization effort for implementation. The funding proposal made in the plan was not practical in nature.

After completion of the Urban Area Plan under Paurashava Town Infrastructure Development Project, development of the Paurashava will be enhanced following some guiding principles.

13.1.2 Range and Content of the Urban Services

The Plan for Urban Services covers planning area of Kumarkhali Paurashava for a ten years time-frame (from 2011 to 2021). It also comprises a report and maps.

The Plan concern where services will be located (expected development). It also indicates how the Structure Plan policies will govern the areas and the standard for services calculated (based on the population forecast).

Outline of the Plan gives guidance to the Paurashava how the urban services will be developed and be promoted, maintained with a coordinated manner.

The Plan has been divided into five main parts i.e. existing condition and demand of the services, implementation strategies, proposal, regulations needed for establishment and management of the services, monitoring and evaluation of the plan. Water supply, sewerage facility, electricity, telephone and gas supply are the major concern of this plan.

13.2 Analysis of Existing Condition and Demand of the Services

13.2.1 Introduction

The Paurashava is too poor in development of urban services. With the development of physical condition of the Paurashava, substantial development will be needed for those services. Drinking water supply, sewerage and sanitation facilities and dumping of solid wastes should be emphasized as primary consideration. All the people (except 0.3%) are dependent on hand tubewell for drinking water. Absence of solid waste dumping ground creates health hazards. Absence of covered drain and sewerage system creates sanitation problem in the Paurashava. Those problems should be removed through the proper planning and design.

Map 13-1: Existing Urban Services

13.2.2 Analysis and Projection on Existing and Proposed Urban Services

Water Supply: The water requirement for Upazilla towns is generally estimated to be about 100 lpcd considering 20% technical loss and 20% demand of Industrial and commercial purpose.

Based on this general rule water requirement per day for the Paurashava at present is about 2191400 Liters and it will be 2709700 liters for the projected year 2031.

Electricity:
In Kumarkhali Paurashava, electricity is provided only in all Wards by the Rural Electrification Board (REB). With the increase of households and also with the increase of commercial activities in future, the coverage of electricity has to be extended over the entire Paurashava area to meet the growing demand.

Telephone:
Demand for land phone connections in the Paurashava has substantially reduced in recent years due to increased number of cell phone subscription.

Gas supply:
Gas supply is not available in the Paurashava area.

Other urban services:

Waste transfer station, dumping site, slaughter house should considered as urban services.

Projection
The projection of utility service depends on the population growth and need assessment of the Paurashava inhabitants. After completion of population projection it is found that, population of the planning area will be 27091 in the year 2031. Projection on utility services also depends on present condition of urban services and future demand of those services.

Demand analysis:Existing utility facilities of the Paurashava are not sufficient and established without following any standard. Therefore, Team Leaders of all packages and urban planners from Project Management Office (PMO) have worked out and prepared different standards for projection of future facilities as per the requirement of Paurashava. Following of those standards have considered for the future demand with ensuring the quality and quantity of utility facilities.

Table 13-1: Standard of utility facilities and future need

Facility	Standard	Existing Facility (acre)	Requirement (acre)	Proposed Facility including Existing (acre, 2031)
Drianage	As per Requirement	-	-	-
Water supply	1.00 acre /20,000 population	0	1.35	0.26
Gas	1.00 acre /20,000 population	0	1.35	0
Solid waste	4 – 10 acres/Upazila HQ	0	7.00	3.29

disposal site				
Waste transfer station	0.25 acres/per waste transfer station	0	-	0
Electric sub-station	1.00 acre/20,000 population	0	1.35	0
Telephone exchange	0.5 acre/20,000 population	0	0.68	0
Fuel Station	0.5 acre/20,000 population	0	0.68	0
Slaughter House	As per requirement	-	-	0.25
Others	-	-	-	1.26
Total		**Not Ctegorized**	**12.41**	**5.06**

Note: Estimated from Planning Standard provided by PMO and Projected Population of Project area.

13.3 Proposals for Addressing Urban Services and Implementation Strategies

13.3.1 Introduction

Following strategies will be followed for implementation urban services in the planning area:

- Cost for service development will be promoted in phases, based on comprehensive plan for the demarcated entire Paurashava areas. This process will reduce cost.
- Some areas will be targeted as new urban areas where urbanization is likely to be rapid and imminent.
- Except waste disposal all other services (Water Supply, Sewerage, Electricity, telephone and Gas) will be provided by the concerned service giving agencies.

Water supply: Location of **water treatment plant** may be on a large plot (on 0.30 acres of land) with good access, close to source of water. It should be located upstream of any polluting development. **Water reservation tanks** may be constructed on medium size plot in key locations throughout the Paurashava, preferably in an elevated positioning relation to the area it is intended to serve, so as to maintain / increase pressure.

Sewerage facilities: Location of **sewerage treatment plant** may be on large plot (on 0.30 acres of land), preferably on outskirts of the Paurashava. Sewerage pumping station may be located on small plots throughout the Paurashava and a system should be introduced.

Electricity: Existing **Electricity power station** may be developed into **132/33KV switching station.** These can be accommodated on the plots they serve (industries) or in road corridors.

Telephone: There is no telephone exchange withinthe area of the Paurashava.Right now no proposal for this service if needed, it will need a medium size plot (on 0.19 acres of land), unless it also has to accommodate a transmission / reception tower, in which case it will require a fairly large plot. Medium sized plot will be needed for **local exchange**, central to its catchment area. **Street exchange** may be located on small plot in road corridor.

Gas supply: Existing The standard for **gas manifold station**, may be located on small to medium sized plot (on 0.30 acres of land) on the main ring. **Upazila regulator station** may be located on small plots throughout the Paurashava. These will be located at the break-off point on the main line, where smaller diameter spurs extend into the area that the gas will serve.

13.3.2 Proposals for Urban Services

For existing urban services, the Paurashava will need to establish a communication with each of the appropriate implementing agencies the following:

- Which of the existing services run, not currently in road corridors, could or should be relocated into road corridors to facilitate planned development bearing in mind the cost implications of doing this?
- The corridor reservations that should be applied to the service networks that cannot be moved.
- The means of establishing and maintaining these reservations, free from other development.
- For future expansions of the networks (in case of sewerage, possibly a new network), the Paurashava will need to establish with the appropriate implementing agency what the future requirements are, so that reservations can be applied and maintained. The Paurashava will need as part of this process:
- Try to ensure that secondary, tertiary and where possible primary networks are located within existing or proposed road corridors to minimize the requirement for separate land reservations. In most cases, it is known that this can be achieved. The likely exception will be primary electricity networks. The scale of this will demand separate land reservations.
- Where this cannot be achieved, agree with the relevant agency about the size of the reservation required, its alignment and approximate time-scale of implementation.
- To adopt the agreed reservation and ensure that it is maintained. When development applications are received which impinge upon this reservation, the Paurashava should not permit the development within the reservation, but ensure that it will be made to setback to the limit of the reservation.

Types of urban services that will need to be considered within the Paurashava are indicated below:

Electricity:Primary networks; principally 132KV, pylon supported power lines from the existing power stations which will enter the Paurashava at purpose built switching stations. The switching stations will usually be located at the fringe of the Paurashava. **Secondary networks**; 33KV or 11KV pole mounted power lines, although in cases the 33KV lines can also be pylon mounted. The 33KV lines will originate at the above mentioned switching station and supply power around the Paurashava to smaller switching stations at key locations around the Paurashava where they will be down-sized to 11KV. These, in turn, will supply power to more localized electricity sub-stations. The pole mounted lines can be located within principle road corridors (primary and district distributors). Pylon mounted lines should be allocated their own reserve. **Tertiary**

networks; at the localized sub-stations, the 11KV power will be down-sized for distribution to individual premises. Power leaving these sub-stations is usually carried by 415V pole mounted lines. These can be accommodated within road corridors.

Water supply: Within all road area there should be provision of installation of water supply network and about 0.25 acres of land has earmarked for office or relevant activity.

Sewerage facilities: If a sewerage network were to be installed, the sewerage originating throughout the Paurashava would be carried by means of underground pipes and culverts. These should be accommodated within road reserves.

Telephone: Telephone exchange lines can be either overhead, pole mounted or underground using newer Optical Fiber Cables. Both of these are carried to localized exchanges and then onto small roadside exchanges. From these connections are carried on poles to individual premises. All networks can be accommodated within road reserves.

Gas supply: All gas line will be supplied by varying diameter underground pipes. These can be accommodated in road reserves.

Other urban services: Waste transfer station, dumping site, slaughter house should considered as urban services.

13.3.3 Regulations to Address the Proposals

According to Local Government (Paurashava) Act, 2009the 2nd Schedule, Sl. No. 10, the Paurashava may provide supply of wholesome water sufficient for public and private purposes. Frame and execute water supply scheme for the construction and maintenance of such works for storage and distribution of water. In case of private sources of water supply, it is said that, all private sources of water supply within the Paurashava shall be subject to control, regulation and inspection by the Paurashava. No new well, water pump or any other source of water for drinking purposes shall be dug, constructed or provided except with the sanction of the Paurashava.

The regulations, as discussed above, will be needed for provisioning of drinking water supply both Paurashava and private sources in the Paurashava.

The sewerage facilities may be provided by the Paurashava and Directorate of Public Health Engineering (DPHE). According to the 2nd Schedule, Sl. No. 12, of the Local Government (Paurashava) Act, 2009, Paurashava may provide an adequate system of public drains and all such drains shall be constructed, maintained, kept, cleared and emptied with due regard to the heal and convenience of the public. All private drains shall be subject to control, regulation and inspection by the Paurashava.

Public Health (Emergency Provisions) Ordinance, 1944 (Ordinance No. XXI of 1944)was enacted in 20th May 1944.According to the **s**ection 2(e) “public health services” and “public health establishment” include respectively sanitary, water-supply, vaccination, sewage disposal, drainage and conservancy services and establishment maintained for the purposes of such services, and any other service or establishment of a local authority which the Government may by notification in the Official Gazette declare to be a public health service or public health establishment for any purpose of this Ordinance.

Based on the regulation, the Directorate of Public Health Engineering (DPHE) is performing activities for drinking water supply. If DPHE likes to render their service according to the water supply network as presented in this plan, the regulation will be the safeguard for them.

East Pakistan Water and Power Development Authority Rules, 1965 (No. 4-1(E) was prepared and notified in 12th July 1965. The Power Development Board (PDB) is empowered for power generation under the guidance of Electricity Act, 1910. At present, PDB and Rural Electrification Board (under the Rural Electrification Board Ordinance, 1977) is performing the role relevant with the electrification of the Paurashava. The existing authorities will be needed for electrification of the Paurashava according to the guidelines presented in the plan.

Telegraph and Telephone Board Ordinance, 1975 (Ordinance No. XLVII of 1975) was enacted in 30th August 1975. A Telegraph and Telephone Board (T&T Board) was composed through this Ordinance. Section 6(1) of the Ordinance has prescribed the functions of the Board and said, it shall be the function of the Board to provide efficient telegraph and telephone services and to do all acts and things necessary for the development of telegraphs and telephones. In the Paurashava, at present, a T & T Board is performing the functions prescribed in the section 6(1). T & T Board is the sole authority for performing the same and it will be continued in future also. But, the Mobile telephone system generates a revolution in the society. Most of the people are depended on the Mobile phone system. The plan does not consider this system.

13.3.4 Implementation, Monitoring and Evaluation of the Urban Services Plan

Implementation through Multi-Sectoral Investment Programme: Major infrastructure development works such as primary roads, water supply, drainage, etc., will largely be controlled by Government. Public works requires efficient co-ordination through the Multi-Sectoral Investment Programme (MSIP).

Objective of a Multi-Sectoral Investment Programme (MSIP) will match a list of the development projects with the funding stream necessary to implement them. There are two basic activities that would determine the contents of MSIP. One activity would be to prioritize and schedule the investment projects of all public agencies so they will collectively help to achieve the development goals and objectives of the Urban Services Plan. Second activity would be to analyze the source and availability of fund for the prioritized list of development projects.

Map 13-2: Proposed Urban Services

Implementation through Action Plans and Projects: Action Plans and Projects will be the implementation plans to solve problems at the local level. Action plans will take a direct approach toward plan implementation with a minimum of research, reports or elaborate planning methods. These projects will be easily identifiable and will require minimum resource.

Implementation through Development Control: Landuse zoning is one of several methods of plan implementation to be considered. In all cases where some form of development, landuse control may be applied; careful consideration requires the following ideologies:

- the purpose to be achieved by the development controls;
- where controls should be applied;
- what aspect of development needs to be controlled;
- what type of development controls are required;
- what degree or level of development control is required;
- who will be affected by the required control;
- who will be affected by the controls and in what manner;
- when the controls should be applied;
- what will be the likely impact of the controls;
- how and by whom will the controls be administered and enforced.

Development control as an instrument of plan implementation may be selectively applied within the Urban Services Plans. Development controls would also be varied in intensity and detail to suit the particular circumstances. It is important that they should be clear and easily understood by all parties concerned. Since the entire Paurashava Master Plan 'package' has become statutory, development controls associated with its component plans would also be statutory.

Implementation by Facilitating Private Investment: Another approach that would be taken by government toward plan implementation will be to guide and facilitate investments made by the private sector. Government can achieve this with relative ease and at very low cost by setting up a legal and operational framework, coupled with suitable incentives, to facilitate land consolidation, plot boundary readjustment, efficient lay out of plots and provision of local infrastructure by the private sector. The benefits of this approach would be:

- increased efficiently of the urban land market would make, more private land available to urban households;
- would pass much of the development costs for local infrastructure to the private sector and land market mechanisms;
- would increase in land for development without large cash outlays by government to purchase land for development schemes; and

- would keep provision of land for community facilities virtually no cost to government.

Plan Monitoring

The Urban Services Plan would simply be tools for guiding and encouraging the growth and development of an urban area in a preferred manner. In a rapidly changing urban environment, the Urban Services Plan would require to keep up to date. If this is not done, within a few years it will be obsolete. Therefore, it is imperative that the requirement for regular updating of the Urban Services Plan be made a legal requirement.

For implementation of the various programme components of the Urban Services Plan appropriate administrative measures will have to be undertaken. This will essentially include project preparation and monitoring of their execution and evaluation. For carrying out all these activities appropriate institutional measures are also be needed.

Evaluation

Monitoring and evaluation of on going and implemented projects is essential to keep the future course of action on the right track. An on going project should be regularly monitored and handicaps identified to enable taking appropriate measures at the right time.

Post implementation evaluation is also needed to take appropriate measures correcting past errors-from project preparation to implementation.

The top level supervision has to be done by a high level supervisory committee headed by the Paurashava Mayor, representatives of the service giving agencies and Local Government Ministry. Other members of the committee will be local Ward Councilors, local community leader/social workers and the Town Planner of the Paurashava. The committee will supervise implementation works regularly and issue necessary instructions to expedite the works of implementation.

CHAPTER-14

WARD ACTION PLAN

Mere preparation of Ward Action Plan will not be sufficient due to resource constraint. Securing Right of Way (ROW) for circulation network and utility corridor needs huge funds which cannot be met from public exchequer. To minimize the cost of development Paurashava should involve the landowners in the development process. This can be achieved by declaring some of the developing corridors as concession for development through people's participation where landowners will become development partners and share the development cost through contribution of a portion of their land. Paurashava has to follow Ward Action Plan for those areas utilizing development techniques like Guided Land Development or Land Readjustment. Paurashava has to show strong determination and willingness as this is a very difficult task to accomplish involving hundreds of people. Paurashava has to increase its efficiency and do the work at the appropriate time.

14.1 Background

There are several patches of land in the Paurashava area where planned development can be achieved through use of different land development techniques. One of those techniques is Land Readjustment Technique, may be practiced for the development of Ward as a Ward Action Plan. The plan prepared for designated areas in conforming to the land development techniques is known as Action Area Plan.

It is also expected that following successful implementation of the Ward Action Plan in one side, management would be more efficient in handling projects and in another people residing in unplanned areas would feel the benefit of such Action Plan ensuring more effective community participation.

14.1.1 Content and Form of Ward Action Plan

The report has been divided in to five main parts. These are preceded by introductory part which explain the approach of the report and provide background with the linkage of Structure Plan and Urban Area Plan. Part two of the report identifies strategies and policies prescribed in the Structure Plan and Urban Area Plan and their uses for the preparation of Ward Action Plan. The chapter also covers prioritization in case of development needs and Ward-wise Action Plan for next five years. Ward-wise Action Plan is being presented in the next part of the report. Proposal, priority tasks and financial involvement with the infrastructural development as a priority basis are the outcome of this part. Implementation guidelines are the key issues of part four. Comparative Advantage of Master Plan and proposals for mitigation of identified issues are the components of last part of this report.

14.1.2 Linkage with the Structure and Urban Area Plan

The Ward Action Plan for the Paurashava has been prepared on the basis of following principles relevant with the Structure Plan and Urban Area Plan:

- Environment friendly sustainable development of the area.
- Town functions to develop as per major landuse zones.
- Effective drainage system through minimum hindrance to Flood Flow zones.
- Safe residential areas at proximity to place of work or major communication routes.
- Smooth and effective functioning of industries, specially agro-based industries.
- Safe yet faster connectivity.
- Develop to serve the surrounding hinterlands.

14.1.3 Approach and Methodology

For the preparation of Ward Action Plan the planning area has been sub-divided into Nine Planning Zones according to the individual Ward. Immediate necessary action will be required for Ward Action Plan and this is the key outcome of Ward Action Plan. Where, what type of action will be required and how the action will be performed prescribed in the plan.

Pro-people Urban Planning

The Ward Action Planning approach utilizes in the Paurashava Master Plan concentrating mainly on the building of infrastructure and roads to facilitate the movements of vehicles. In this scenario, Paurashava society would become steadily more privatized with private homes, offices and commercial activities, while all-important public component of urban life is likely to slowly disappear.

The landuse and transport interaction for a modern city should be directed toward “Planning for people, not for vehicles, roads or buildings”. Given the problems of alienation, crime, fear of strangers and the breakdown of civic life, it is increasingly important to make cities inviting so that people can meet their fellow citizens face-to-face and experience human contact with those unknown to and different from them directly through their senses. Public life in high quality public spaces is an important part of a democratic society and full life.

Evidence-based vs. Arbitrary Planning Approach

In the era of globalization, where information on any number of issues and about any number of places is readily accessible, there is no need for localities to continue making the same mistakes as they did when operating in an information and experience vacuum. While urban planning is of course a complicated process, it is also true that some universals exist in terms of what works and what does not. The experiences of urban areas adopting commercial-based and people-based approaches make clear the effects of either method, and many guides are now available on implementing planning approaches that are good for the natural environment and for urban dwellers.

Given the widespread availability of such information, it is highly regrettable that important landuse and transport policy-decisions should adopt either any knowledge-

based or scientific analysis. Instead, arbitrary or so-called "common sense" approaches should not be utilized which may favour the rich, including bureaucrats and developers with little concern for the betterment of society overall.

Although, it is a demanding task to represent the complex dynamics of urban landuse changes that are consistent with observable data, significant progress has been made in recent years in the country in forecasting and evaluating landuse change on the basis of dynamic and causal relationships between such factors as transport and landuse, and built environment and socio-economic processes.

With the advance of the knowledge-base and technology-base, detailed and extensive urban form and function data is becoming increasingly available, with great potential to provide new insights for sustainable urban planning which preserves the eco-system and maintains or even increases social equity.

Yet no attempt was made in the preparation of Upazila Master Plan / Landuse Plan (in 1980s) to conduct any analytical or empirical analysis using data related to interactions between the built environment, transport, landuse and other socio-economic processes.

Again, in Paurashava Master Plan, the Geographic Information System (GIS)-based technology is mainly used for mapping and visual displays, which are limited to static displays of past and current data sets. That is, the displays only portray the current state of the system, with neither the reasons given for its condition nor possible alternate futures provided. As a result, policymakers and planners are now facing tremendous difficulties, lacking as they do any insight into future urban growth and the potential impacts of various models.

Hypothetical Planning Approach under Upazila Master Plan / Landuse Plan, no comprehensive data collection exercise was undertaken to estimate landuse requirements for the Paurashava. As a result, all the landuse proposals of that plan were hypothetical in nature, providing no insight into how the actual landuse demand for various purposes will meet in future.

Yet it is not logical to develop a Ward Action Plan, which represents the lowest tier of the planning hierarchy, without providing precise landuse allocations for different functional purposes.

Furthermore, in the Paurashava Plan, a significant portion of existing open space and agriculture land have been allocated for private developers required as per the 2031 population projection. This excess land for property developers is likely not only to create landuse speculation but also indiscipline in future landuse development. More importantly, the preservation of land for open space and agriculture is vital for the health and viability of the Paurashava and its inhabitants.

14.2 Prioritization

Immediate action is being needed for the development of Wards. Those actions are presented here according to the priority:

1st Priority: Traffic Management and Engineering

- Improvement of intersections on the regional road, including a ranked program of roundabout construction and a reduced role and operation of Zebra Crossing.
- Removal of bus and non-motorized vehicles stops from junctions, restrictions.
- Better traffic police enforcement and additional resources.
- Adoption of design guidelines for road improvement and for parking and access arrangements in new developments.
- Priority for footpath reinstatement, signing of national standards and corrections to serious local road surface irregularities such as pole-bases.
- Enforcement of development control on the National Highway.

2nd Priority: Improvement of transport services

- Encouragement of higher quality bus services by allowing higher fares for such services at least from Kumarkhali to Dhaka.
- Designation of separate service road both side of Rajbari-Kushtiaroad.

3rd Priority: Improvement of drainage congestion

- Improvement of drainage congestion as specified in the drainage plan especially in the areas where the drainage conjestion is high.
- Control indiscriminate earth filling which may hamper natural drainage system of the Paurashava.
- Construction of box culverts before road construction/expansion as specified in the drainage plan.
- Remove encroachment from the natural drainage like ponds and rivers.
- Control earth filling activities on natural canals outside the Paurashava boundary.

4th Priority: Rainwater harvesting

- The ponds indiscriminately located in the Paurashava and their size is not less than 0.25 acre is proposed for rainwater harvesting. At the sametime, solar energy may be produced using those proposed lands.
- Implementation of the above mentioned components will be selected as priority project. The priority project comprises all those works identified for implementation during the plan period. These are urgently needed to alleviate existing monsoon flooding and to prevent the risk of inundation. As a result of questionnaire survey to locate areas of flooding and discussions with Paurashava.
- The storm water drainage priority project includes the provision of adequately – sized silt traps, removal of obstructions. The major component of work is construction of missing-links to carry water from Paurashava Town Centre to the River.

14.3 Ward-wise Action Plan for Next Five Years

The priority mentioned in the Clause14.2 follows according to the Ward for next five years. Those priorities are the primary steps of development considering the year from 2014 to 2019.

Possible ways of financing the Master Plan assumes that:

- Funds for construction of regional road and undertaking flood defence works will be obtained from GoB in the usual way and these will not be directly recovered from the beneficiaries in Paurashava.
- Funds for providing storm water drainage and construction of local road will be provided by loans for capital expenditure. These will be recovered from the Paurashava dwellers, primarily from taxes on property. Various loan conditions have been considered, the most onerous of which is GoB's standard on lending rate is 12.5% per annum interest, repayable over 20 years, including a 5-year grace period. It has been assumed that maintenance costs are directly recovered through local taxation.
- The implementation of Master Plan component will require funding either from grant or from increased local taxes.

14.3.1 Action Plan for Ward No. 1

Existing Situation:

It is situated on the north-west part of the Paurashava and Ward No. 2 on the south and Ward No.6 on the east. This area is characterized by residential development. Development pressure is comparatively low but the estern of this ward is high dense and consists a major portion of builtup area of the Paurashava.

Total population of this area is 2305 person (population cencus 2011).

Total planning area of the Ward is 147.95 acres. Among the total planning area, 43.38 acres land is under agriculture use 54.42 acres residential, only 1.92 acres commercial industrial and others are in different category.

There is 7.49 km of road of which 3.98 km is pucca 1.83 km is semi pucca and 1.68 km is katcha. There is 7.58 man made drains within this ward.

Development proposals:

LanduseDevelopment: For planned development considering the existing landuse and future demand landuse proposal has made. Within the total area 38.28% land proposed for residential use, only 0.94% are commercial use1.13 % mixed use, only 0.91% are education & research, only 0.07% agricultural and others are in different category which are shown in the following table.

Table 14.1: Proposed landuse for Ward no-1

Land Use n Type	Area (Acre)	Percentage(%)
Urban Residential Zone	85.11	57.53
Rural Settlement	0.00	0.00
Commercial Zone	1.39	0.94
Mixed Use Zone	1.67	1.13
General Industrial Zone	1.03	0.70
Governmental Services	1.73	1.17
Education and Research	1.34	0.91
Agriculture Zone	0.11	0.07
Water Body	21.34	14.42
Open Space	5.55	3.75
Recreational Facilities	0.00	0.00

Land Use n Type	Area (Acre)	Percentage(%)
Circulation Network	26.68	18.03
Transport & Communication	0.42	0.28
Utility Service	0.15	0.10
Health Services	0.82	0.55
Community Facilities	0.62	0.42
Urban Defferd	0.00	0.00
Total	147.95	100

The proposed facilities considering the demand of the ward were shown in the following table including phasing. The proposed facilities under different category of land uses are also shown in the following table.

Table 14.2: proposed facilities for ward no -1

Proposed Facilitiles	Phase	CS Mouza Name	Plot No.	Area in Acre
Residential				
Planned Residential Area-1	2nd	Uday Bishnupur	1-26, 53, 101-122, 124-126, 135, 144	20.141
Planned Residential Area-2	2nd	Uday Bishnupur	30-50, 54, 55-57	8.649
		Elangi	359-367	
Transportation				
Tempo Stand	1st	Kumarkhali	256-257 part	0.377
Utility & service facility				
Public Toilet-3	1st	Kumarkhali	213	0.145
Community Facilities				
Ward Center	1st	Kumarkhali	225	0.154

Proposal for road development:

A total of 6.05 km road has proposed for road network development of this ward of which some are new and some are widening. Wihin all roads 1.85 km road will construct within 1st phase. Recommanded road network are shown in the following table.

Map 14.1: Landuse Proposal for Ward No. 01

Map 14.2: Proposed Road, Drainage and Utility Services Plan for Ward No. 01

Table 14.3: Proposed road for ward no-1

Road ID	Width (feet)	Length(M)	Phase	Type
RP01	100	1,178.99	2nd	Widening
RS03	60	181.60	1st	Widening
RS05	40	1.99	2nd	Widening
RS10	40	821.88	1st	Widening
RS11	40	598.79	2nd	Widening
RS11	40	0.08	2nd	Widening
RS12	40	160.94	2nd	Widening
RS20	40	214.53	2nd	Widening
RS22	40	833.81	1st	Widening
RS24	40	4.36	2nd	Widening
RS26	40	101.82	2nd	Widening
RS27	40	262.69	2nd	Widening
RL40	30	223.05	2nd	Widening
RL41	30	212.46	2nd	Widening
RL42	30	213.67	2nd	Widening
RL43	30	353.53	2nd	Widening
RL53	30	195.10	2nd	Widening
RL74	30	228.76	2nd	Widening
RA79	20	5.86	1st	Widening
RA82	20	239.04	3rd	New
RA83	20	7.37	1st	Widening
RA88	20	4.55	1st	Widening
Total		6,044.87		

**Note: W= widening, N= New Road*

3) Proposal for drianage development:

A total of 6.05 km drain has proposed for drainage network development of this ward of which almost all are new. Wihin all drains 1.85 km drain will construct within 1st phase. Recommanded drains are shown in the following table.

Table 14.4: Proposed drainage for ward no-1

Drain ID	Type	Length(M)	Phase
DP01	Primary	1,178.99	2nd
DP03	Primary	181.60	1st
DS05	Secondary	1.99	2nd
DS10	Secondary	821.88	1st
DS11	Secondary	388.43	2nd
DS11	Secondary	210.44	2nd
DS12	Secondary	160.94	2nd
DS20	Secondary	214.53	2nd
DS22	Secondary	833.81	1st
DS24	Secondary	4.36	2nd
DS26	Secondary	101.82	2nd
DS27	Secondary	262.69	2nd
DT40	Tertiary	223.05	2nd
DT41	Tertiary	212.46	2nd
DT42	Tertiary	213.67	2nd
DT43	Tertiary	353.53	2nd
DT53	Tertiary	195.10	2nd
DT74	Tertiary	228.76	2nd

DT79	Tertiary	5.86	1st
DT82	Tertiary	239.04	3rd
DT83	Tertiary	7.37	1st
DT88	Tertiary	4.55	1st
Total		6,044.87	

14.3.2 Action Plan for Ward No. 2

Existing Situation:

It is situated at western part of the area, Ward No. 1 at the north, Ward 06 at the east and Ward No.3&4 at the southern part of the Ward. This area is characterized as vast residential area with new urban development potentialiaty of the Paurashava.

Total population of this area is 1994 person (population cencus 2011).

Total planning area of the Ward is 48.69 acres. There is no agricultural land in this ward. Among the total area only commercial land is 0.46 acres, residential 34.83 acres and other are in different category.

There is 3.33km of road of which 2.5 km is pucca, 0.37 km is semi-pucca and 0.43 km is katcha. A total of 2.07 km drains exist in this ward.

Proposals and Plans for Ward No. 2

LanduseDevelopment: For planned development considering the existing landuse and future demand landuse proposal has made. Within the total area 65.41% land proposed for residential use, 0.76% are commercial use, only 1.54% are community facilities and others are in different category which are shown in the following table.

Table 14.5:Proposed landuse for Ward no-2

Land Use Type	Area (Acre)	(%)
Urban Residential Zone	31.85	65.41
Rural Settlement	0.00	0.00
Commercial Zone	0.37	0.76
Mixed Use Zone	0.00	0.00
General Industrial Zone	2.20	4.52
Governmental Services	0.55	1.13
Education and Research	0.01	0.02
Agriculture Zone	0.00	0.00
Water Body	3.39	6.96
Open Space	2.92	6.00
Recreational Facilities	0.00	0.00
Circulation Network	6.58	13.51
Transport & Communication	0.00	0.00
Utility Service	0.00	0.00
Health Services	0.07	0.14
Community Facilities	0.75	1.54
Urban Defferd	0.00	0.00
Total	48.69	100.00

The proposed facilities considering the demand of the ward were shown in the following table including phasing. The proposed facilities under different category of land uses are also shown in the following table.

Map 14.3: Landuse Proposal for Ward No. 02

Map 14.4: Proposed Road, Drainage and Utility Services Plan for Ward No. 02

Table 14.6: proposed facilities for ward no -2

Proposed Facilitiles	Phase	CS Mouza Name	Plot No.	Area in Acre
Community Facilities				
Ward Center	1st	Elangi	514-515, 643 part, 647, 653-654	0.493

Proposal of road development:

A total of 2.50 km road has proposed for road network development of this ward of which some are new and some are widening. Wihin all roads only 1.29 km road will construct within 1st phase. Recommanded road network are shown in the following table.

Table 14.7: Proposed road for ward no-2

Road ID	Width (feet)	Length(M)	Phase	Type
RS21	40	89.23	2nd	Widening
RS24	40	484.58	2nd	Widening
RS25	40	23.76	1st	Widening
RS32	40	116.62	2nd	Widening
RL39	30	162.78	2nd	Widening
RL51	30	169.65	2nd	Widening
RL52	30	184.62	2nd	Widening
RA80	20	465.30	1st	Widening
RA83	20	199.04	1st	Widening
RA84	20	154.26	1st	Widening
RA85	20	189.18	1st	Widening
RA86	20	109.16	1st	Widening
RA88	20	152.25	1st	Widening
Total		2500.43		

Note: W= widening, N= New Road

3) Proposal for drianage development:

A total of 2.50 km drain has proposed for drainage network development of this ward of which almost all are new. Wihin all drains 1.29 km drain will construct within 1st phase. Recommanded drains are shown in the following table.

Table 14.8: Proposed drainage for ward no-2

Drain ID	Type	Length(M)	Phase
DS21	Secondary	89.23	2nd
DS24	Secondary	484.58	2nd
DS25	Secondary	23.76	1st
DS32	Secondary	116.62	2nd
DT39	Tertiary	162.78	2nd
DT51	Tertiary	169.65	2nd
DT52	Tertiary	184.62	2nd
DT80	Tertiary	465.30	1st
DT83	Tertiary	199.04	1st
DT84	Tertiary	154.26	1st
DT85	Tertiary	189.18	1st
DT86	Tertiary	109.16	1st
DT88	Tertiary	152.25	1st
Total		2500.43	

14.3.3 Action Plan for Ward No. 3

Existing Situation:

It is situated at western part of the area, Ward No. 2 at the north,Ward 04at the east and Garai River at the southern part of the Ward. This area is characterized as vast residential area with new urban development potentialiaty of the Paurashava.

Total population of this area is 2018 person (population cencus 2011).

Total planning area of the Ward is 69.15 acres. There is no agricultural land in this ward. Among the total area only commercial land is only 0.18 acres, residential 45.36 acres and other are in different category.

There is 5.72 km of road of which 4.14 km is pucca, 0.67 km is semi-pucca and 0.91 km is katcha. A total of 1.99km drains exist in this ward.

Proposals and Plans for Ward No. 3

1) LanduseDevelopment*:*For planned development considering the existing landuse and future demand landuse proposal has made. Within the total area43.08% land proposed for residential use, only 0.82% are commercial use,1.34% mixed use, 11.51% heavy industrial zone, only 0.17% agricultural andothers arein different category which are shown in the followingtable.

Table 14.9: Poposed landuse for Ward no-3

Land Use	Area (Acre)	Percentage
Urban Residential Zone	40.64	58.80
Rural Settlement	0.00	0.00
Commercial Zone	0.13	0.19
Mixed Use Zone	0.00	0.00
General Industrial Zone	1.39	2.01
Governmental Services	0.00	0.00
Education and Research	6.42	9.29
Agriculture Zone	0.00	0.00
Water Body	5.57	8.06
Open Space	1.09	1.58
Recreational Facilities	0.00	0.00
Circulation Network	12.4	17.94
Transport & Communication	0.00	0.00
Utility Service	0.00	0.00
Health Services	0.00	0.00
Community Facilities	1.49	2.16
Urban Defferd	0.00	0.00
Total	69.12	100.00

The proposed facilities considering the demand of the ward were shown in the following table including phasing. The proposed facilities under different category of land uses are also shown in the following table.

Map 14.5: Landuse Proposal for Ward No. 03

Map 14.6: Proposed Road, Drainage and Utility Services Plan for Ward No. 03

Table 14.10: proposed facilities for ward no -3

Proposed Facilitiles	Phase	CS Mouza Name	Plot No.	Area in Acre
Open Spce				
Community Park-3	1st	Elangi	3321, 3323-3327 part	0.409
Community Facilities				
Ward Center	1st	Elangi	2870 part	0.153

Proposal for road development:

A total of 4.34km road has proposed for road network development of this ward of which some are new and some are widening. Wihin all roads only 1.29 km road will construct within 1st phase. Recommanded road network are shown in the following table.

Table 14.11: Proposed road for ward no-3

Road ID	Width (Feet)	Length(M)	Phase	Type
RS03	60	754.80	1st	Widening
RS05	40	292.24	2nd	Widening
RS06	40	314.55	2nd	Widening
RS07	40	122.65	2nd	Widening
RS08	40	215.67	1st	Widening
RS21	40	199.44	2nd	Widening
RS23	40	781.22	1st	Widening
RS24	40	302.96	2nd	Widening
RS32	40	2.23	2nd	Widening
RL35	30	210.96	2nd	Widening
RL36	30	276.96	2nd	Widening
RL37	30	191.24	2nd	Widening
RL38	30	146.07	2nd	Widening
RL39	30	4.60	2nd	Widening
RL50	30	241.41	2nd	Widening
RL51	30	4.07	2nd	Widening
RL52	30	6.57	2nd	Widening
RA79	20	149.50	1st	Widening
RA87	20	120.50	1st	Widening
Total		**4337.64**		

**Note: W= widening, N= New Road*

3) Proposal for drianage development:

A total of 4.34 km drain has proposed for drainage network development of this ward of which almost all are new. Wihin all roads 2.02 km drain will construct within 1st phase. Recommanded drains are shown in the following table.

Table 14.12: Proposed drainage for ward no-3

Drain ID	Type	Length(M)	Phase
DP03	Primary	754.80	1st
DS05	Secondary	292.24	2nd
DS06	Secondary	314.55	2nd
DS07	Secondary	122.65	2nd
DS08	Secondary	215.67	1st
DS21	Secondary	199.44	2nd

Drain ID	Type	Length(M)	Phase
DS23	Secondary	781.22	1st
DS24	Secondary	302.96	2nd
DS32	Secondary	2.23	2nd
DT35	Tertiary	210.96	2nd
DT36	Tertiary	276.96	2nd
DT37	Tertiary	191.24	2nd
DT38	Tertiary	146.07	2nd
DT39	Tertiary	4.60	2nd
DT50	Tertiary	241.41	2nd
DT51	Tertiary	4.07	2nd
DT52	Tertiary	6.57	2nd
DT79	Tertiary	149.50	1st
DT87	Tertiary	120.50	1st
Total		4337.64	

14.3.4 Action Plan for Ward No. 4

Existing Situation:

It is situated on the south-west part of the Paurashava and northern side of ward no-2. Garai River has situated on the southern side of this ward. This area is characterized by urban fringe area.

Total population of this area is 2477 person (population cencus 2011).

Total planning area of the Ward is 36.04 acres. Among the total area only commercial 0.36 acres, residential 28.47 acres and 1.45 acres waterbody.

There is 3.56 km of road of which 2.70 km are pucca 0.45 km are semi-pucca and 0.41 km are katcha. There is 1.62 km man made drain exists in this ward.

Proposals and Plans for Ward No. 4

1) LanduseDevelopment*:*For planned development considering the existing landuseand future demand landuse proposal has made. Within the total area 70.17% land proposed for residential use, only 0.89 % is commercial use, only 3.94% agricultural and others are in different categories which are shown in the following table.

Table 14.13: Proposed land use for Ward no-4

Land UseType	Area (Acre)	Percentage(%)
Urban Residential Zone	25.29	70.17
Rural Settlement	0.00	0.00
Commercial Zone	0.32	0.89
Mixed Use Zone	0.00	0.00
General Industrial Zone	1.06	2.94
Governmental Services	0.15	0.42
Education and Research	0.71	1.97
Agriculture Zone	0.00	0.00
Water Body	1.42	3.94
Open Space	0.27	0.75
Recreational Facilities	0.00	0.00
Circulation Network	6.39	17.73
Transport & Communication	0.00	0.00
Utility Service	0.00	0.00

Land UseType	Area (Acre)	Percentage(%)
Health Services	0.00	0.00
Community Facilities	0.44	1.22
Urban Defferd	0.00	0.00
Total	36.04	100.00

The facilities considering the demand of the ward were shown in the following table including phasing. The proposed facilities under different category of land uses are also shown in the following table.

Table 14.14: proposed facilities for ward no -4

Proposed Facilitiles	Phase	CS Mouza Name	Plot No.	Area in Acre
Community Facilities				
Ward Center	1st	Kumarkhali	1100 part, 1101, 1102 part	0.144

Map 14.7: Landuse Proposal for Ward No. 04

Map 14.8: Proposed Road, Drainage and Utility Services Plan for Ward No. 04

Proposal for road development:

A total of2.39 km road has proposed for road network development of this ward of which some are new and some are widening. Wihin all roads only 1.13 km road will construct within 1st phase. Recommanded road network are shown in the following table.

Table 14.15: Proposed road for ward no-4

Road ID	Width (Feet)	Length(M)	Phase	Type
RS08	40	522.80	1st	Widening
RS09	40	23.68	1st	Widening
RS25	40	449.27	1st	Widening
RS32	40	4.81	2nd	Widening
RL43	30	228.63	2nd	Widening
RL54	30	324.85	2nd	Widening
RL55	30	101.02	2nd	Widening
RA80	20	2.13	1st	Widening
RA89	20	129.73	3rd	New
RA90	20	466.25	3rd	New
RA120	20	11.09	3rd	New
RA124	20	130.16	1st	Widening
Total		2394.42		

**Note: W= widening, N= New Road*

3) Proposal for drianage development:

A total of 2.39 km drain has proposed for drainage network development of this ward of which almost all are new. Wihin all roads 1.13 km drain will construct within 1st phase. Recommanded drains are shown in the following table.

Table 14.16: Proposed drainage for ward no-4

Drain ID	Type	Length(M)	Phase
DS08	Secondary	522.80	1st
DS09	Secondary	23.68	1st
DS25	Secondary	449.27	1st
DT80	Tertiary	2.13	1st
DT124	Tertiary	130.16	1st
DS32	Secondary	4.81	2nd
DT44	Tertiary	228.63	2nd
DT54	Tertiary	324.85	2nd
DT55	Tertiary	101.02	2nd
DT89	Tertiary	129.73	3rd
DT90	Tertiary	466.25	3rd
DT120	Tertiary	11.09	3rd
Total		2394.42	

14.3.5Action Plan for Ward No. 5

Existing Situation:

It is situated at the middle portion of the ward and it consiss a mjor portion of the core area. Garai River at the southern part of the ward.

Total population of this area is 2477 person (population cencus 2011).

Total area of the Ward is 114.74 acres. Among the total area, agriculture use is 15.44 acres, commercial9.43 acres and residential 44.73 acres.

There is 9.08 km of road of which 7.94 pacca and rest are katcha. About 3.61km man made drain exists in this ward.

Proposals and Plans for Ward No. 5

1)LanduseDevelopment*:*For planned development considering the existing landuse and future demand landuse proposal has made. Within the total area 45.64 land proposed for residential use, 8.02 % commercial use, 1.54% mixed use, only 0.47% agricultural and others are in different category which is shown in the following table.

Table14.17: Proposed land use for Ward no-5

Land UseType	Area (Acre)	(%)
Urban Residential Zone	52.37	45.64
Rural Settlement	0.00	0.00
Commercial Zone	9.2	8.02
Mixed Use Zone	1.77	1.54
General Industrial Zone	5.62	4.90
Governmental Services	1.74	1.52
Education and Research	2.28	1.99
Agriculture Zone	0.54	0.47
Water Body	14.05	12.25
Open Space	4.34	3.78
Recreational Facilities	0.11	0.10
Circulation Network	16.46	14.35
Transport & Communication	0.06	0.05
Utility Service	0.26	0.23
Health Services	4.1	3.57
Community Facilities	1.84	1.60
Urban Defferd	0.00	0.00
Total	114.74	100.00

The facilities considering the demand of the ward were shown in the following table including phasing. The proposed facilities under different category of land uses are also shown in the following table.

Table 14.18: proposed facilities for ward no -5

Proposed Facilitiles	Phase	CS Mouza Name	Plot No.	Area in Acre
Residential				
Re-Settlement Residential Zone	2nd	Serkandi	1847-1850, 1852-1857, 1863, 1865	24.955
Open Spce				
Community Park-4	1st	Serkandi	1839-1841	1.710
Utility & service facility				
Water Pump Station	1st	Serkandi	1774 part	0.257
Community Facilities				
Community Center	1st	Serkandi	1622	0.151
Cremation	2nd	Serkandi	1407 part	0.460

Map 14.9:**Landuse Proposal for Ward No. 05**

Map 14.10**: Proposed Road, Drainage and Utility Services Plan for Ward No. 05**

2) Proposal for road development:

A total of 5.23 km road has proposed for road network development of this ward of which some are new and some are widening. Wihin all roads 3.72 km road will construct within 1st phase. Recommanded road network are shown in the following table.

Table 14.19: Proposed road for ward no-5

Road ID	Width (Feet)	Length(M)	Phase	Type
RP01	100	161.23	2nd	Widening
RS08	40	226.14	1st	Widening
RS09	40	447.01	1st	Widening
RS13	40	893.33	1st	Widening
RS19	40	3.89	1st	Widening
RS22	40	138.00	1st	Widening
RS25	40	449.97	1st	Widening
RS27	40	8.08	2nd	Widening
RS31	40	158.90	2nd	Widening
RS33	40	539.23	1st	Widening
RS34	40	359.71	1st	Widening
RL43	30	7.87	2nd	Widening
RL45	30	4.40	2nd	Widening
RL46	30	3.33	2nd	Widening
RL56	30	547.15	2nd	Widening
RL58	30	4.79	2nd	Widening
RL59	30	4.95	2nd	Widening
RL60	30	18.25	2nd	Widening
RL72	30	174.57	2nd	Widening
RA93	20	3.69	1st	Widening
RA94	20	259.15	1st	Widening
RA95	20	234.94	1st	Widening
RA96	20	160.63	1st	Widening
RA120	20	309.36	3rd	New
RA121	20	104.83	3rd	New
RA124	20	4.54	1st	Widening
Total		5227.94		

**Note: W= widening, N= New Road*

3) Proposal for drianage development:

A total of 5.23 km drain has proposed for drianage network development of this ward of which almost all are new. Wihin all roads 3.72 km drain will construct within 1st phase. Recommanded drains are shown in the following table.

Table 14.20: Proposed drainage for ward no-5

Drain ID	Type	Length(M)	Phase
DS08	Secondary	226.14	1st
DS09	Secondary	447.01	1st
DS13	Secondary	893.33	1st
DS19	Secondary	3.89	1st
DS22	Secondary	138.00	1st
DS25	Secondary	449.97	1st
DS33	Secondary	539.23	1st
DS34	Secondary	359.71	1st

Drain ID	Type	Length(M)	Phase
DT93	Tertiary	3.69	1st
DT94	Tertiary	259.15	1st
DT95	Tertiary	234.94	1st
DT96	Tertiary	160.63	1st
DT124	Tertiary	4.54	1st
DP01	Primary	161.23	2nd
DS27	Secondary	8.08	2nd
DS31	Secondary	158.90	2nd
DT44	Tertiary	7.87	2nd
DT45	Tertiary	4.40	2nd
DT46	Tertiary	3.33	2nd
DT56	Tertiary	547.15	2nd
DT58	Tertiary	4.79	2nd
DT59	Tertiary	4.95	2nd
DT60	Tertiary	18.25	2nd
DT72	Tertiary	174.57	2nd
DT120	Tertiary	309.36	3rd
DT121	Tertiary	104.83	3rd
	Total	5227.94	

14.3.6 Action Plan for Ward No. 6

Existing Situation:

It is mainly builtup area consisting upazila complex. Ward No. 5 is on the west, Ward no-5 on the northern part of this Paurashava.

Total area of the Ward is 257.27 acres. Among the total area, agriculture use is 61.83 acres, govt. services 11.17 acres, commercial use 14.78 acres and residential 58.10 acres.

There is 14.23 km of road of which 10.11km is pucca 0.68 km is semi pucca and 3.44 km is katcha. A total of 1.69 km drains exist in this ward.

Proposals and Plans for Ward No. 6

LanduseDevelopment: For planned development considering the existing landuse and future demand landuse proposal has made. Within the total area 25.69% land proposed for residential use, 22.62 % water body, 6.56% are community facility, 8.64% agricultural and others are in different category.

Table 14.21: Proposed land use for Ward no-6

Land UseType	Area (Acre)	Percentage(%)
Urban Residential Zone	66.08	25.69
Rural Settlement	0.00	0.00
Commercial Zone	17.92	6.97
Mixed Use Zone	13.19	5.13
General Industrial Zone	3.98	1.55
Governmental Services	10.64	4.14
Education and Research	3.87	1.50
Agriculture Zone	22.22	8.64
Water Body	58.2	22.62
Open Space	15.22	5.92
Recreational Facilities	0.00	0.00
Circulation Network	38.36	14.91

Land UseType	Area (Acre)	Percentage(%)
Transport & Communication	0.43	0.17
Utility Service	0.37	0.14
Health Services	0.24	0.09
Community Facilities	6.56	2.55
Urban Defferd	0.00	0.00
Total	257.27	100.00

The facilities considering the demand of the ward were shown in the following table including phasing. The proposed facilities under different category of land uses are also shown in the following table.

Table 14.22: proposed facilities for ward no -6

Proposed Facilitiles	Phase	CS Mouza Name	Plot No.	Area in Acre
Residential				
Low Income Houseing Area	2nd	Batikamara	501-511, 530-531, 534 part, 535-539, 1295-1300, 1303, 1304, 1526-1527, 1576-1586, 1823-1828, 1829 part, 1823-1838	13.122
Commercial Facility				
Proposed Facilitiles	Phase	CS Mouza Name	Plot No.	Area in Acre
Poura New Market	2nd	Serkandi	253-255, 256 part, 257-263	4.593
Cattle Market	1st	Batikamara	2013 part, 2039 part, 204-2042	1.314
Open Spce				
Central Park Cum Stadium	3rd	Batikamara	1255-1260, 1266, 1277-1279, 1282, 1286-1287, 1291-1293, 1311, 1312 part, 1318 part, 1320 part, 1399	8.165
Utility & service facility				
Public Toilet-2	1st	Serkandi	112 part	0.112
Slatter House	1st	Batikamara	2013 part, 2038 part	0.254
Community Facilities				
Community Center	1st	Serkandi	307 part	0.289
Poura Central Mosque & Graveyard	1st	Batikamara	1282-1285, 1289-1290 1330, 1519-1525, 1529-1530	5.426
Ward Center	1st	Serkandi	248 part, 249 part, 254 part	0.166

2) Proposal for road development:

A total of 11.44 km road has proposed for road network development of this ward of which some are new and some are widening. Wihin all roads 5.43 km road will construct within 1st phase. Recommanded road network are shown in the following table.

Table 14.23: Proposed road for ward no-6

Road ID	Width (Feet)	Length(M)	Phase	Type
RP01	100	783.81	2nd	Widening
RS10	40	0.45	1st	Widening
RS13	40	457.32	1st	Widening

Road ID	Width (Feet)	Length(M)	Phase	Type
RS14	40	4.45	1st	Widening
RS15	40	552.09	2nd	Widening
RS19	40	2,457.28	1st	Widening
RS28	40	651.56	2nd	Widening
RS33	40	751.91	1st	Widening
RL43	30	0.71	2nd	Widening
RL45	30	334.81	2nd	Widening
RL46	30	731.33	2nd	Widening
RL47	30	423.70	3rd	New
RL48	30	365.98	3rd	New
RL49	30	171.89	2nd	Widening
RL58	30	232.18	2nd	Widening
RL59	30	230.87	2nd	Widening
RL67	30	8.96	2nd	Widening
RL69	30	5.46	2nd	Widening
RL71	30	479.12	2nd	Widening
RL77	30	399.50	2nd	Widening
RL78	30	329.86	2nd	Widening
RA81	20	199.74	1st	Widening
RA91	20	143.20	1st	Widening
RA92	20	55.65	1st	Widening
RA93	20	310.47	1st	Widening
RA111	20	3.75	1st	Widening
RA115	20	219.20	1st	Widening
RA116	20	227.00	1st	Widening
RA117	20	133.35	1st	Widening
RA118	20	173.70	1st	Widening
RA119	20	293.01	1st	Widening
RA122	20	158.44	3rd	New
RA123	20	153.46	3rd	New
Total		11,444.21		

**Note: W= widening, N= New Road*

3) Proposal for drianage development:

A total of 11.44 km drain has proposed for drainage network development of this ward of which almost all are new. Wihin all drains 5.43 km drain will construct within 1st phase. Recommanded drains are shown in the following table.

Table 14.24: Proposed drainage for ward no-6

Drain ID	Type	Length(M)	Phase
DS10	Secondary	0.45	1st
DS13	Secondary	457.32	1st
DS14	Secondary	4.45	1st
DS19	Secondary	2,457.28	1st
DS33	Secondary	751.91	1st
DT81	Tertiary	199.74	1st
DT91	Tertiary	143.20	1st
DT92	Tertiary	55.65	1st
DT93	Tertiary	310.47	1st
DT111	Tertiary	3.75	1st
Drain ID	Type	Length(M)	Phase
DT115	Tertiary	219.20	1st

Drain ID	Type	Length(M)	Phase
DT116	Tertiary	227.00	1st
DT117	Tertiary	133.35	1st
DT118	Tertiary	173.70	1st
DT119	Tertiary	293.01	1st
DP01	Primary	783.81	2nd
DS15	Secondary	552.09	2nd
DS28	Secondary	651.56	2nd
DT43	Tertiary	0.71	2nd
DT45	Tertiary	334.81	2nd
DT46	Tertiary	731.33	2nd
DT49	Tertiary	171.89	2nd
DT58	Tertiary	232.18	2nd
DT59	Tertiary	230.87	2nd
DT67	Tertiary	8.96	2nd
DT69	Tertiary	5.46	2nd
DT71	Tertiary	479.12	2nd
DT77	Tertiary	399.50	2nd
DT78	Tertiary	329.86	2nd
DT47	Tertiary	423.70	3rd
DT48	Tertiary	365.98	3rd
DT122	Tertiary	158.44	3rd
DT123	Tertiary	153.46	3rd
Total		11,444.21	

Map 14.11**: Landuse Proposal for Ward No. 06**

Map 14.12**: Proposed Road, Drainage and Utility Services Plan for Ward No. 06**

14.3.7 Action Plan for Ward No. 7

Existing Situation:

It is maily rural character with vast residential land and situated on the eastern part of the Paurashava. Ward No. 6 is on the north-west, Ward No.8 on the southern part of this Paurashava.

Total population of this area is 2923 person (population cencus 2011).

Total area of the Ward is 112.17 acres. Among the total area, agriculture use is 22.86 acres, waterbody 9.37 acres and residential 67.42 acres.

There is 6.37 km of road of which 5.26 km is pucca, only 0.021km is semi-pucca and 1.09 km is katcha. Here is 0.99 km man made drain exists in this ward.

Proposals and Plans for Ward No. 7

LanduseDevelopment*:*For planned development considering the existing landuse and future demand landuse proposal has made. Within the total area 52.41% land proposed for residential use, only 0.28% are commercial use, 1.18% mixed use, 13.85% agricultural and others are in different category which are shown in the following table.

14.25: Proposed land use for Ward no-7

Land Use Type	Area (Acre)	Percentage (%)
Urban Residential Zone	58.79	52.41
Rural Settlement	0.00	0.00
Commercial Zone	0.31	0.28
Mixed Use Zone	0.2	0.18
General Industrial Zone	1.81	1.61
Governmental Services	0.00	0.00
Education and Research	4.54	4.05
Agriculture Zone	15.53	13.85
Water Body	8.51	7.59
Open Space	1.4	1.25
Recreational Facilities	0.00	0.00
Circulation Network	15.24	13.59
Transport & Communication	2.7	2.41
Utility Service	0.00	0.00
Health Services	2.31	2.06
Community Facilities	0.84	0.75
Urban Defferd	0.00	0.00
Total	112.17	100.00

The facilities considering the demand of the ward were shown in the following table including phasing. The proposed facilities under different category of land uses are also shown in the following table.

Table 14.26: proposed facilities for ward no -7

Proposed Facilitiles	Phase	CS Mouza Name	Plot No.	Area in Acre
Transportation				
Track Terminal & Loading & Unloading	2nd	Khayerchara	27 part, 51-55, 58-67	2.70
Educational Institution				
Vocational Training Institution	3rd	Batikamara	4732, 4736, 4737 part,	3.129
		Khayerchara	25-26, 27-28 part	
Community Facilities				
Community Center	1st	Batikamara	3417-3418 part	0.171

2) Proposal for road development:

A total of 6.22 km road has proposed for road network development of this ward of which some are new and some are widening. Wihin all roads 4.19 km road will construct within 1st phase. Recommanded road network are shown in the following table.

Table 14.27: Proposed road for ward no-7

Road ID	Width (Feet)	Length(M)	Phase	Type
RP01	100	83.56	2nd	Widening
RS14	40	568.85	1st	Widening
RS18	40	1,117.68	1st	Widening
RS33	40	11.24	1st	Widening
RL60	30	5.11	2nd	Widening
RL61	30	4.71	2nd	Widening
RL67	30	580.47	2nd	Widening
RL68	30	340.38	2nd	Widening
RL69	30	419.64	2nd	Widening
RL70	30	230.31	3rd	New
RL70	30	202.57	2nd	Widening
RL73	30	104.25	3rd	New
RA99	20	6.61	1st	Widening
RA107	20	93.23	1st	Widening
RA108	20	122.09	1st	Widening
RA109	20	337.23	1st	Widening
RA110	20	188.43	1st	Widening
RA111	20	224.66	1st	Widening
RA112	20	213.18	1st	Widening
RA113	20	143.95	1st	Widening
RA114	20	92.48	1st	Widening
RA125	20	230.21	1st	Widening
RA126	20	386.03	1st	Widening
RA127	20	101.16	1st	Widening
RA128	20	156.13	1st	Widening
RA129	20	64.76	1st	Widening
RA130	20	131.64	1st	Widening
RA139	30	61.14	2nd	Widening
Total		6,221.7		

**Note: W= widening, N= New Road*

Map 14.13**: Landuse Proposal for Ward No. 07**

Map 14.14**: Proposed Road, Drainage and Utility Services Plan for Ward No. 07**

3) Proposal for drianage development:

A total of 6.22 km drain has proposed for drainage network development of this ward of which almost all are new. Wihin all roads 4.19 km drain will construct within 1st phase. Recommanded drains are shown in the following table.

Table 14.28: Proposed drainage for ward no-7

Drain ID	Type	Length(M)	Phase
DS14	Secondary	568.85	1st
DS18	Secondary	1,117.68	1st
DS33	Secondary	11.24	1st
DT99	Tertiary	6.61	1st
DT107	Tertiary	93.23	1st
DT108	Tertiary	122.09	1st
DT109	Tertiary	337.23	1st
DT110	Tertiary	188.43	1st
DT111	Tertiary	224.66	1st
DT112	Tertiary	213.18	1st
DT113	Tertiary	143.95	1st
DT114	Tertiary	92.48	1st
DT125	Tertiary	230.21	1st
DT126	Tertiary	386.03	1st
DT127	Tertiary	101.16	1st
DT128	Tertiary	156.13	1st
DT129	Tertiary	64.76	1st
DT130	Tertiary	131.64	1st
DT01	Primary	83.56	2nd
DT60	Tertiary	5.11	2nd
DT61	Tertiary	4.71	2nd
DT67	Tertiary	580.47	2nd
DT68	Tertiary	340.38	2nd
DT69	Tertiary	419.64	2nd
DT70	Tertiary	201.30	2nd
DT139	Tertiary	61.14	2nd
DT70	Tertiary	231.59	3rd
DT73	Tertiary	104.25	3rd
	Total	6,221.71	

14.3.8 Action Plan for Ward No. 8

Existing Situation:

It is maily rural character with vast residential land and situated on the southern part of the Paurashava. Ward No. 7 is on the north, Ward No. 9 is on the southern part of this Paurashava.

Total population of this area is 3013 person (population cencus 2011).

Total area of the Ward is 148.12 acres. Among the total area, agriculture use is 47.54 acres, residential 70.42 acres, 16.00 acres are water body and other are different purposes.

There is 6.20 km of road of which 4.51 km is pucca, 0.62 km is semi-pucca and 1.07 km is katcha. Around 2.47 km man made drain exists in this ward.

Proposals and Plans for Ward No. 8

LanduseDevelopment*:* For planned development considering the existing landuse and future demand landuse proposal has made. Within the total area 46.10% land proposed for residential use,3.21% are commercial use, 3.56% mixed use, 6.76% agricultural and others are in different category which are shown in the following table.

Table 14.29: Proposed land use for Ward no-8

Land UseType	Area (Acre)	Percentage(%)
Urban Residential Zone	68.28	46.10
Rural Settlement	0.00	0.00
Commercial Zone	4.76	3.21
Mixed Use Zone	5.27	3.56
General Industrial Zone	0.59	0.40
Governmental Services	0.05	0.03
Education and Research	10.89	7.35
Agriculture Zone	10.01	6.76
Water Body	10.55	7.12
Open Space	4.84	3.27
Recreational Facilities	0.00	0.00
Circulation Network	23.23	15.68
Transport & Communication	3.72	2.51
Utility Service	1	0.68
Health Services	2.39	1.61
Community Facilities	2.55	1.72
Urban Defferd	0.00	0.00
Total	148.12	100.00

The facilities considering the demand of the ward were shown in the following table including phasing. The proposed facilities under different category of land uses are also shown in the following table.

Table 14.30: proposed facilities for ward no -8

Proposed Facilitiles	Ward Name	CS Mouza Name	Plot No.	Area in Acre
Commercial Facility				
Wholesale Market	Ward No. 08	Khayerchara	5, 6-7 part, 9 part, 17-18, 19 part, 43 part, 70-73 part, 74, 75-77 part, 84-85, 88, 89 part, 90, 91-92 part	4.494
Transportation				
Track Terminal & Loading & Unloading(Part)	Ward No. 08	Khayerchara	24 part, 68-69, 71-72 part	3.241
Educational Institution				
Pourashava Collegiate School	Ward No. 08	Batikamara	4457, 4460-4462 part, 4463, 4464 part, 4465, 4466-4467 part, 4468, 4469 part, 4470-4474, 4475 part, 4476-4478, 4737 part, 5054-5056 part	7.782
Vocational Training Institute (part-2)	Ward No. 08	Batikamara	5054-5056 part	2.912
		Khayerchara	20-23, 24 part	
Open Spce				
Poura Shisu Park	Ward No. 08	Batikamara	4429 part, 4436 part, 4459-4460 part, 5008-5017	4.685
Utility & service facility				
Dumping Site	Ward No. 09	Khayerchara	704-711, 712 part, 716-717	3.287
Public Toilet-1	Ward No. 08	Khayerchara	92 part, 93 part, 94 part	1.000
Helath Facilities				
Hospital Zone	Ward No. 08	Batikamara	5018-5022, 5023 part, 5024-5031, 5036-5037, 5038-5039 part, 5040	4.71
Community Facilities				
Ward Center	1st	Batikamara	3965 part	0.222

Proposal for road development:

A total of 6.51 km road has proposed for road network development of this ward of which some are new and some are widening. Wihin all roads 2.53 km road will construct within 1st phase. Recommanded road network are shown in the following table.

Table 14.31: Proposed road for ward no-8

Road ID	Width (Feet)	Length(M)	Phase	Type
RP02	100	1,563.73	3rd	New
RS04	60	138.14	1st	Widening
RS13	40	197.19	1st	Widening
RS14	40	256.81	1st	Widening
RS29	40	6.68	2nd	Widening
RS29	40	177.62	3rd	New
RL56	30	2.07	2nd	Widening

Road ID	Width (Feet)	Length(M)	Phase	Type
RL57	30	71.29	2nd	Widening
RL60	30	522.55	2nd	Widening
RL61	30	330.80	2nd	Widening
RL62	30	196.83	2nd	Widening
RL63	30	682.13	2nd	Widening
RL64	30	14.50	3rd	New
RL66	30	158.62	2nd	Widening
RL73	30	93.15	3rd	New
RL75	30	110.24	2nd	Widening
RL76	30	54.15	2nd	Widening
RA94	20	5.28	1st	Widening
RA97	20	413.73	1st	Widening
RA98	20	170.16	1st	Widening
RA99	20	206.00	1st	Widening
RA100	20	286.18	1st	Widening
RA101	20	300.81	1st	Widening
RA102	20	103.59	1st	Widening
RA107	20	447.75	1st	Widening
RA133	20	2.78	1st	Widening
Total		6,512.78		

**Note: W= widening, N= New Road*

3) Proposal for drianage development:

A total of 6.51 km drain has proposed for drainage network development in this ward of which almost all are new. Wihin all roads 2.53 km drain will construct within 1st phase. Recommanded drains are shown in the following table.

Map 14.15**: Landuse Proposal for Ward No. 08**

Map 14.16: Proposed Road, Drainage and Utility Services Plan for Ward No. 08

Table 14.32: Proposed drainage for ward no-8

Drain ID	Type	Length(M)	Phase
DP04	Primary	138.14	1st
DS13	Secondary	197.19	1st
DS14	Secondary	256.81	1st
DT94	Tertiary	5.28	1st
DT97	Tertiary	413.73	1st
DT98	Tertiary	170.16	1st
DT99	Tertiary	206.00	1st
DT100	Tertiary	286.18	1st
DT101	Tertiary	300.81	1st
DT102	Tertiary	103.59	1st
DT107	Tertiary	447.75	1st
DT133	Tertiary	2.78	1st
DS29	Secondary	8.18	2nd
DT56	Tertiary	2.07	2nd
DT57	Tertiary	71.29	2nd
DT60	Tertiary	522.55	2nd
DT61	Tertiary	330.80	2nd
DT62	Tertiary	196.83	2nd
DT63	Tertiary	682.13	2nd
DT66	Tertiary	158.62	2nd
DT75	Tertiary	110.24	2nd
DT76	Tertiary	54.15	2nd
DT02	Primary	1,563.73	3rd
DS29	Secondary	176.13	3rd
DT64	Tertiary	14.50	3rd
DT73	Tertiary	93.15	3rd
	Total	6,512.79	

14.3.9 Action Plan for Ward No. 9

Existing Situation:

It is maily rural character with vast agricultural land and situated on the southern part of the Paurashava. Ward No. 8 is on the north, Garai River on the northern part of this ward.

Total population of this area is 2515 person(population cencus 2011).

Total area of the ward is 366.42 acres. Among the total area, agriculture use is 246.97acres, residential 85.14 acres, commercial only 0.35 acres and others are different useases.

There is 9.43 km of road of which 5,53 km is pucca,0.69 km is semi-pucca and 3.21 km is katcha. No man made drain exists in this ward.

Proposals and Plans for Ward No. 9

LanduseDevelopment*:* For planned development considering the existing landuse and future demand landuse proposal has made. Within the total area 21.32% land proposed

for residential use, 15.10% are Industrial use, 37.13% agricultural and others are in different category which are shown in the following table.

Table 14.33: Proposed land use for Ward no-9

Land Use Type	Area (Acre)	Percentage (%)
Urban Residential Zone	78.29	21.32
Rural Settlement	6.11	1.66
Commercial Zone	0.43	0.12
Mixed Use Zone	0,00	0.00
General Industrial Zone	55.42	15.10
Governmental Services	0,00	0.00
Education and Research	0.32	0.09
Agriculture Zone	136.33	37.13
Water Body	14.3	3.90
Open Space	9.64	2.63
Recreational Facilities	0,00	0.00
Circulation Network	29.08	7.92
Transport & Communication	0,00	0.00
Utility Service	0.00	0.00
Health Services	0.00	0.00
Community Facilities	3.6	0.98
Urban Defferd	33.63	9.16
Total	367.13	100.00

The facilities considering the demand of the ward were shown in the following table including phasing. The proposed facilities under different category of land uses are also shown in the following table.

Table 14.34: proposed facilities for ward no -9

Proposed Facilitiles	Phase	CS Mouza Name	Plot No.	Area in Acre
Open Spce				
Central Park Cum Stadium	3rd	Batikamara	1255-1260, 1266, 1277-1279, 1282, 1286-1287, 1291-1293, 1311, 1312 part, 1318 part, 1320 part, 1399	8.165
Community Park-1	1st	Agrakunda	215, 218-224, 225 part, 364	1.800
Proposed Facilitiles	Phase	CS Mouza Name	Plot No.	Area in Acre
Playground	1st	Khayerchar	841, 844-862, 863 part, 871-872, 874 part	6.320
Utility & service facility				
Dumping Site	1st	Khayerchara	704-711, 712 part, 716-717	3.287
Industrial				
General Industrial Zone	3rd	Khayerchara	143, 144 part, 145-215, 218, 286-309, 324-326, 444-448, 470, 506-511, 513-570	54.320
Community Facilities				
Ward Center	Ward	Tebaria	469 part, 471-472 part,	0.187

Proposed Facilitiles	Phase	CS Mouza Name	Plot No.	Area in Acre
	No. 09		473, 491 part	

Proposal for road development:

A total of 10.09 km road has proposed for road network development of this ward of which some are new and some are widening. Wihin all roads 5.65 km road will construct within 1st phase. Recommanded road network are shown in the following table.

Table 14.35: Proposed road for ward no-9

Road ID	Width (Feet)	Length(M)	Phase	Type
RP01	100	150.74	2nd	Widening
RS04	60	1,695.31	1st	Widening
RS16	40	982.36	1st	Widening
RS17	40	856.67	1st	Widening
RS29	40	377.47	2nd	Widening
RS30	40	265.91	3rd	New
RL63	30	124.03	2nd	Widening
RL64	30	760.62	3rd	New
RL64	30	315.30	2nd	Widening
RL65	30	800.06	3rd	New
RL66	30	5.43	2nd	Widening
RL75	30	466.59	2nd	Widening
RL76	30	399.00	2nd	Widening
RA103	20	136.24	1st	Widening
RA104	20	352.38	1st	Widening
RA105	20	180.75	1st	Widening
RA106	20	271.35	1st	Widening
RA131	20	394.90	1st	Widening
RA132	20	440.48	2nd	Widening
RA133	20	160.17	1st	Widening
RA134	20	193.65	1st	Widening
RA135	20	162.81	1st	Widening
RA136	20	334.32	2nd	Widening
RA137	20	258.23	1st	Widening
Total				

**Note: W= widening, N= New Road*

Proposal for drianage development:

A total of 10.09 km drain has proposed for drainage network development of this ward of which almost all are new. Wihin all drains 5.65 km drain will construct within 1st phase. Recommanded drains are shown in the following table.

Table 14.36: Proposed drainage for ward no-9

Drain ID	Type	Length(M)	Phase
DP01	Primary	150.74	2nd
DP04	Primary	1,695.31	1st
DS16	Secondary	982.36	1st
DS17	Secondary	856.67	1st
DS29	Secondary	377.47	2nd
DS30	Secondary	265.91	3rd

Drain ID	Type	Length(M)	Phase
DT63	Tertiary	124.03	2nd
DT64	Tertiary	759.94	3rd
DT64	Tertiary	315.98	2nd
DT65	Tertiary	800.06	3rd
DT66	Tertiary	5.43	2nd
DT75	Tertiary	466.59	2nd
DT76	Tertiary	399.00	2nd
DT103	Tertiary	136.24	1st
DT104	Tertiary	352.38	1st
DT105	Tertiary	180.75	1st
DT106	Tertiary	271.35	1st
DT131	Tertiary	394.90	1st
DT132	Tertiary	440.48	2nd
DT133	Tertiary	160.17	1st
DT134	Tertiary	193.65	1st
DT135	Tertiary	162.81	1st
DT136	Tertiary	334.32	2nd
DT137	Tertiary	258.23	1st
Total		10,084.77	

Map 14.17**: Landuse Proposal for Ward No. 09**

Map 14.18: Proposed Road, Drainage and Utility Services Plan for Ward No. 09

14.4 Implementation Guidelines

Implementation of the Ward Action Plan should follow the development control procedures for determining planning applications by use of the simple and standard planning application procedures. A simple application will be assessed quickly against a given set of criteria, essentially consisting of the following:

1. The proposed development confirms all respects mentioned in the policies of the Structure Plan and Urban Area Plan.
2. he usage identified in the application is being considered appropriate for inclusion in an area demarcated in the Ward Action Plan. An indicative list of uses considered appropriate is below:

- buildings are a maximum of four-storied;
- no single building or related group of buildings is 1000 sq. m. of gross floor area; and
- access and utility corridors are not impinged.

Provided that the planning application meets above criteria and the application will be approved and planning permission is given.

Planning applications that do not meet the above criteria or are considered marginal cases (to be known as an invalid simple application) will be subjected to a more detailed examination in considering standard procedure.

Following development and landuses are indicative of those appropriate in the Ward Action Plan:

1. Residential development up to four-storied.
2. Small-scale shops.
3. Primary schools/kindergartens.
4. Mosques (or other religious facilities) servicing a local area plus small graveyard if required.
5. Recreational development.
6. Local health facilities (clinics rather than hospital).
7. Small-scale office (may be public or private) development.
8. Workshops (small-scale workshops with operations only) in daylight hours and low traffic generators.
9. Open space (playgrounds, parks, etc.)
10. Access roads.
11. Utilities; and
12. Drainage channels.

When considering a standard planning application within areas zoned for Ward Action Plan, the Paurashava will need to undertake a two-stage process. First, before considering site specific issues, the Paurashava will need, on receipt of the planning application, to consider the wider context and determine issues relating to the overall area into which the application falls. The Paurashava will need to:

1. Determine the boundaries of the wider area. These will usually be formed by some distinctive natural or man-made feature, for example a khal, river or road which provides access into the area. Such areas will vary in shape and size.
2. Identify the existing landuses within these boundaries. In Ward Action Plan, the predominant use will be residential but other uses will present in the vicinity of the application.
3. Identify and assess the existing access and circulation arrangements of the area. Preferably, the area should be served by 10 meter access roads which run through the entire area providing access to all Wards. These access roads should be linked to local roads. If this is not the case and access roads of sufficient width, are not available, the Paurashava shall consider whether or not further development is appropriate. New development may result in increased vehicular congestion and increased demand for utility services, where this could be difficult to supply.

In these instances, the Paurashava will consider refusal of application or at least a delay until access and utility provision can be made. This may require acquisition of land.

4. Identify the need for community facilities (schools, clinics, religious facilities, open spaces, etc.) or plots for utility services. Do sufficient already exist or should more land be sought for increased provision to the existing population? In this latter instance, the Paurashava will again need to consider acquisition of land including the land, either in part or in full, under consideration for development.
5. Consider areas of high landscape quality in the locality which should be preserved and the potential impact of the proposed development on those areas.

If there is doubt in the mind of the Paurashava as to the answers to the above questions, the planning application will require a more detailed assessment.

Secondly, the Paurashava will need to consider issues relating to the individual site and application. These can only be determined once the overall context of the area has been established. The questions the Paurashava will need to ask are:

1. Can be proposed use of land be considered a “good neighbour”, defined in this situation as a use which can be carried out in any residential area without detriment to the amenities of the area by reason of noise, vibration, smell, fumes, smoke, soot, ash, dust or grit?
    - Is the use likely to generate excessive volumes of traffic which either cannot be accommodated on the existing road system or which are likely to disturb, its neighbours?
    - Will the working hours of the use (if non-residential) cause a disturbance to residential neighbours (with working late in to the evening or night or 24-hours operations likely to cause a nuisance and therefore not being permitted)?
    - If yes to any of the above, the application should be rejected and directed to a more suitable location.
2. Is the use in conformity with the surrounding uses or with those that are compatible with a site in a predominantly residential area?
3. Does the proposed boundary of the application impinge upon a road corridor, utility reserve or drainage channel reserve? If it does, it should be relocated outside such a reserve, even if this constitutes a reduction in the overall size of the plot. If excessive land will be lost as a result, implying that the development can no longer proceed, the application will need to be rejected.

4. Does the application provide for adequate site access from, preferably as minimum, a 6 meter access road? Does it have sufficient on-site or off-site parking facilities to cater for the potential demand? If it does not, the plans should be amended or the application refused.
5. Will the development destroy landscape unique to the location? If it does, its design will need to be altered to protect the landscape, or the application will need to be refused.
6. Is the scale of development proposed in keeping with its neighbours? If too large, it should be reduced. Does it impinge up on the privacy of others? If it does, the design / layout / size should be changed. If it can not be appropriately modified, it should be refused.
7. Will the proposed development negatively impact upon utility provision in the area i.e. will it overload the system for some reason (like high electricity demand or high water consumption)? Will pollution from the proposed activities cause a problem in the neighbourhood? If this is likely to occur, the application should be refused.

If the application is for a major development, have the utility authorities being contacted to give their assessment and approval for the infrastructure works that will be required?

Given the existing situation in some of the Ward Action Plan, where for example, access is already poor or there is insufficient space available to provide adequate infrastructure, the Paurashava will aim to ensure that its decision will not make the situation worse.

The Paurashava will need to process each application within one month, at the end of which time they will either need to:

- approve the application unconditionally;
- approve the application subject to a number of conditions; or
- refuse the application.

14.5 Concluding Remarks

The Master 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 structure of sub-system in space over the medium term and identifies broad programs of direct action especially related to infrastructural development, institutional issues as well as broad financing strategies. The plan also outlines more specific Ward-wise development policies to guide development over the medium terms. One major objective of preparing Master 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 anticipated volume of growth. Other purpose of preparing Master Plan is to facilitate the development control function. It shows the broad landuse zones on a more detailed scale of maps as derived from Structure Plan. The plan provides details of landuse zoning and building controls, the development control function becomes easier to implement with a Master Plan. It also shows land reservations required for essential uses and major infrastructure development.

Comparative Advantage of Master Plan
Comparative advantages of Master Plan rather than Ward Action Plan are:

- The term Master Plan deserves wider sense than the term Ward Action Plan. Policies and strategies are being prescribed in the Master Plan based on the existing trend of development and growth potentiality. The Ward Action Plan only emphasizes on those components immediate action is being necessary.
- The Master Plan is for the Paurashava as a whole but the Ward Action Plan is only for individual Ward. All studies relevant and guided by the ToR is being followed for the preparation of Master Plan at first and based on those studies and findings the Ward Action Plan is being designed.
- The Ward Action Plan is mostly relevant with the implementation criteria; it is called the implementation of Master Plan. The micro-component which is going to be implemented according to the Ward Action Plan is guided by the Master Plan. Therefore, any problem arises during the implementation phase of Ward Action Plan will be resolved through the guideline prescribed in the Master Plan.

Addressing Proposals for Mitigation of Identified Issues

- For improvement, construction and re-construction of local roads, bridge and culvert and box culvert, a close coordination among the authorities named Paurashava, LGED, PDB, REB and WDB will be maintained. This coordination is necessary from the preparation of budget to implementation of the component.
- In plan implementation phase, people's participation will be encouraged. The process as prescribed in the Structure Plan will be initiated for this purpose.
- A buffer will be needed for every important development especially for housing area, stadium and Bus terminal.

In preparing the proposed construction program priorities have been assigned to the works mostly in the various drainage areas taking the following factors into account:

- The severity of flooding in terms of depth, duration and frequency;
- The views of Paurashava officials on the relative needs of different areas;
- The engineering relationship of the proposed phase of construction to the preceding and subsequent phases;
- The estimated time required to execute the proposed works having regard to the capacity and capability of contractors and the availability of materials;
- The estimated amount of the capital investment required.

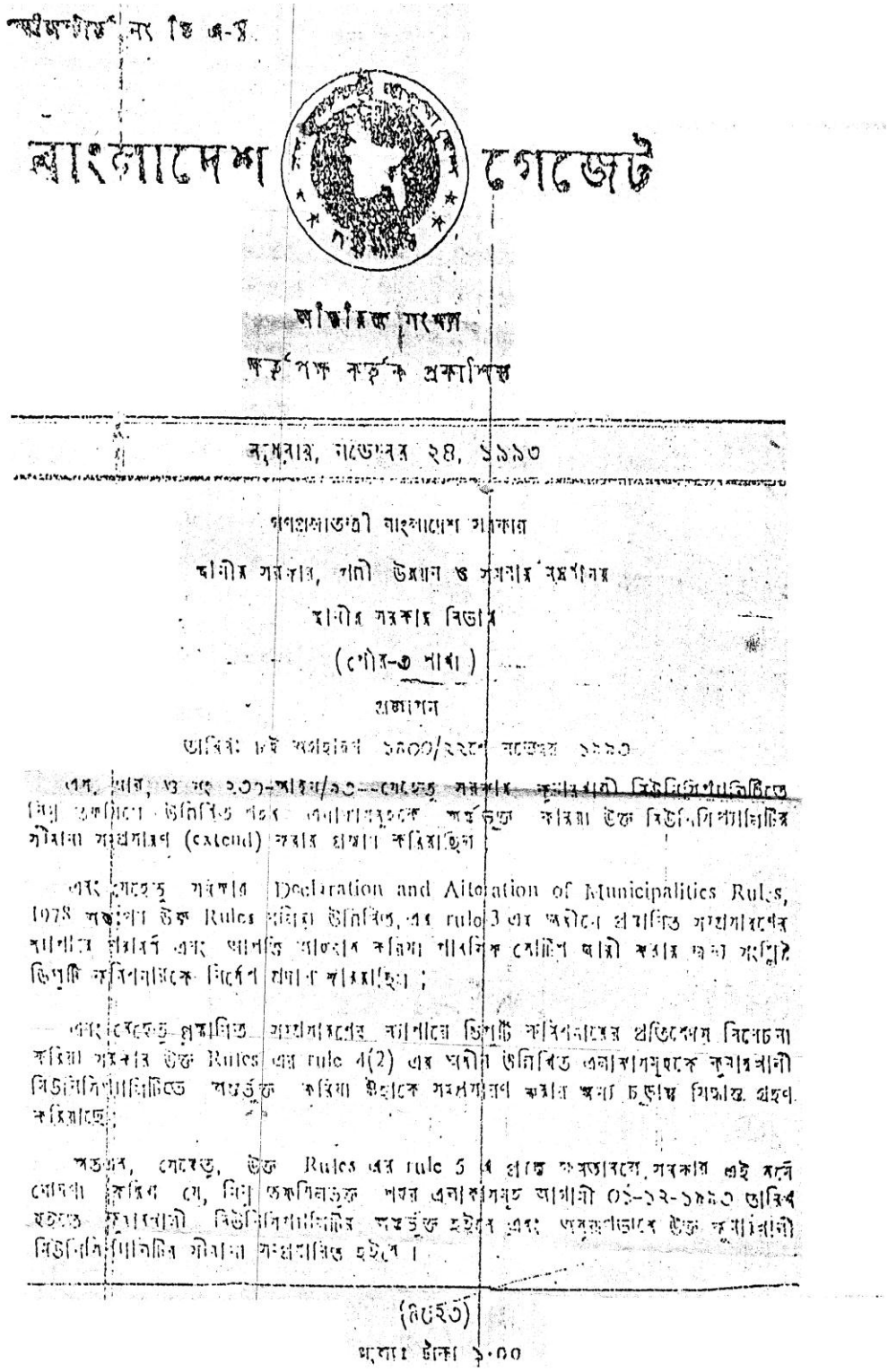
In general, aim should be to implement the Master Plan at a continuous steady rate throughout the 20 years period and based upon the above considerations, the works have been grouped broadly into four main stages:

- The first stage accords priority to improve the Traffic Management and alleviation of flooding in the central area of the Paurashava.
- The second stage in general covers less densely developed areas with the improvement of transport services.
- The third stage covers drainage congestion areas for improvement.
- The fourth stage will be the rain water harvesting for supplying drinking water to the Paurashava dwellers when scarcity will be generated.

To ensure that the procedures are being followed, the Paurashava will need to monitor the situation. This monitoring is required to ensure that:

- No illegal development is taking place i.e. no-one is attempting to develop without submitting an application; and
- Approved developments are built in accordance with the approved plans.
- Aevelopment will take places according to the Master Plan.

ANNEXURE-A
Paurashava Gazette



রেজিস্টার্ড নং ডি এ-১

বাংলাদেশ গেজেট

অতিরিক্ত সংখ্যা

কর্তৃপক্ষ কর্তৃক প্রকাশিত

বুধবার, নভেম্বর ২৪, ১৯৯৩

গণপ্রজাতন্ত্রী বাংলাদেশ সরকার

স্থানীয় সরকার, পানী উন্নয়ন ও সমবায় মন্ত্রণালয়

স্থানীয় সরকার বিভাগ

(পৌর-৩ শাখা)

প্রজ্ঞাপন

তারিখ: ৮ই অগ্রহায়ণ ১৪০০/২২শে নভেম্বর ১৯৯৩

এস, আর, ও নং ২৩৭-আইন/৯৩—যেহেতু সরকার কুমারখালী মিউনিসিপ্যালিটিতে নিম্নে তফসিলে উল্লিখিত গ্রাম এলাকাসমূহকে অন্তর্ভুক্ত করিয়া উক্ত মিউনিসিপ্যালিটির সীমানা সম্প্রসারণ (extend) করার প্রস্তাব করিয়াছিল;

এবং যেহেতু সরকার Declaration and Alteration of Municipalities Rules, 1978 অতঃপর উক্ত Rules বলিয়া উল্লিখিত, এর rule 3 এর অধীনে প্রস্তাবিত সম্প্রসারণের ব্যাপারে আপত্তি এবং আপত্তি থাকিলে করিয়া পাবলিক নোটিশ জারী করার জন্য সংশ্লিষ্ট ডিপুটি কমিশনারকে নির্দেশ প্রদান করিয়াছিল;

এবং যেহেতু প্রস্তাবিত সম্প্রসারণের ব্যাপারে ডিপুটি কমিশনারের প্রতিবেদন বিবেচনা করিয়া সরকার উক্ত Rules এর rule 4(2) এর অধীন উল্লিখিত এলাকাসমূহকে কুমারখালী মিউনিসিপ্যালিটিতে অন্তর্ভুক্ত করিয়া উহাকে সম্প্রসারণ করার জন্য চূড়ান্ত সিদ্ধান্ত গ্রহণ করিয়াছে;

অতএব, যেহেতু, উক্ত Rules এর rule 5 এ প্রদত্ত ক্ষমতাবলে সরকার এই মর্মে ঘোষণা করিল যে, নিম্নে তফসিলভুক্ত গ্রাম এলাকাসমূহ আগামী ০১-১২-১৯৯৩ তারিখ হইতে কুমারখালী মিউনিসিপ্যালিটির অন্তর্ভুক্ত হইবে এবং অনুরূপভাবে উক্ত কুমারখালী মিউনিসিপ্যালিটির সীমানা সম্প্রসারিত হইবে।

(বিজ্ঞ)

মূল্য: টাকা ১.০০

৪০২৪ বাংলাদেশ গেজেট, অতিরিক্ত, নভেম্বর ২৪, ১৯৯০

তফসিল

ক্রমিক নং	মৌজা	ইউনিয়ন	জে, এল, নং	দাগ নং
১।	[illegible]	[illegible]	১৪০	৭১২—৭৬৫ এবং ৮০২—৯৫১।
২।	[illegible]	সাবদালপুর	১১১	৩৮, ৪১—১২৩, ১৩৪—৪০১, ৮১৯, ৮২১, ৮২২, ৮২৫—৮২৮, ৮৩২—৮৩৭, ১২৩৪—১২৪৩, ১৭৫০—১৮৪২ এবং ১৯০১—২০০৭।
৩।	[illegible]	[illegible]	১২৮	৩২৮—৩৬৩।
৪।	[illegible]	ঐ	১২৭	২২, ২৬, ৩০—৬৫, ১০১—১০২, ১০৮, ১০৯।
৫।	[illegible]	ঐ	১৮৫	১—১০১, ২০৭—৩৪০, ৩৫০, ৪২৯—৪৫৭ এবং ৬৩৯—৬৬২, ১০৩৬, ১০৫৩, ১০৫৮—১০৬২, ১০৬৭, ১০৭৮, ১০৭৯, ২০৮০।

রাষ্ট্রপতির আদেশক্রমে
মোঃ [illegible]
উপ-সচিব (পৌর)।

মোঃ মিজানুর রহমান, উপ-নিয়ন্ত্রক, বাংলাদেশ সরকারী মুদ্রণালয়, ঢাকা কর্তৃক মুদ্রিত।
মোঃ আব্দুর রশীদ সরকার, উপ-নিয়ন্ত্রক, বাংলাদেশ ফরমস্ ও প্রকাশনী অফিস, তেজগাঁও, ঢাকা কর্তৃক প্রকাশিত।

ANNEXURE-B
Permitted Landuse List

Urban Residential Landuse

Landuse Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table No. A.1: Landuse Permitted

Permitted
Artisan's Shop
Assisted Living or Elderly Home
Confectionery Shop
Barber Shop
Child Daycare \ Preschool
Cleaning \ Laundry Shop
Communication Service Facilities
Communication Tower Within Permitted Height
Condominium or Apartment
Cottage
Cyber Café
Daycare Center (Commercial or Nonprofit)
Drug Store or Pharmacy
Employee Housing (Guards \ Drivers) \ Ancillary Use
General Store
Grocery Store
High School
Household Appliance and Furniture Repair Service (No Outside Storage)
Housing For Seasonal Firm Labor
Landscape and Horticultural Services
Mosque, Place Of Worship
Newspaper Stand
Nursery School
Orphanage
Eidgah
Photocopying and Duplicating Services (No Outside Storage)
Pipelines and Utility Lines
Playing Field
Primary School
Private Garages (Ancillary Use)
Project Identification Signs
Property Management Signs

Permitted
Public Transport Facility
Satellite Dish Antenna
Shelter (Passers By)
Shoe Repair or Shoeshine Shop (Small)
CBO Office
Special Dwelling
Temporary Tent
Temporary Pandle for Permitted Function
Newspaper Stand
Specialized School: Dance, Art, Music, Physically Challenged & Others
Transmission Lines
Urban-Nature Reserve
Utility Lines
Woodlot
Children's Park (Must Have Parking)
ATM Booth
Water Pump \ Reservoir
Monument (Neighborhood Scale)
Bill Payment Booth
Boarding and Rooming House
Dormitory
Memorial Structure (Ancillary)
Neighborhood Center* *(Where Neighborhood Center exists)*
Permitted
Community Center
Doctor \ Dentist Chamber
Cultural Exhibits and Libraries
Fast Food Establishment \ Food Kiosk
Flowers, Nursery Stock and Florist Supplies
Fitness Centre
Gaming Clubs
Departmental Stores
Retail Shops \ Facilities

Permission of Neighborhood Center Facilities in absence of formal neighborhood should be subject to Landuse Permit Committee*Source: Compiled by the Consultants*

Landuse Conditionally Permitted

The following uses may be permitted or disallowed in this zone after review and approval by the authority/committee following appropriate procedure while the application meets the criteria mentioned in the requirement.

Table No. A.2: Landuse Conditionally Permitted

Conditional
Addiction Treatment Center
Amusement and Recreation (Indoors)
Funeral Services
Art Gallery, Art Studio \ Workshop
Automobile Driving Academy
Beauty and Body Service
Billiard Parlor \ Pool Hall
Book or Stationery Store or Newsstand
Building Maintenance \ Cleaning Services, No Outside Storage
Bus Passenger Shelter
Graveyard \ Cemetery
Coffee Shop \ Tea Stall
Correctional Institution
Courier Service
Crematorium
Plantation (Except Narcotic Plant)
Furniture & Variety Stores
Emergency Shelter
Energy Installation
Garages
Garden Center or Retail Nursery
Fire Brigade Station
Police Station
Temporary Rescue Shed
Guest House
Slaughter House
Static Transformer Stations
Tourist Home or Resort
Market (Bazar)
Optical Goods Sales
Outdoor Café
Outdoor Fruit and Vegetable Markets
Community Hall
Neighborhood Co-Operative Office
Overhead Water Storage Tanks
Row House
Paints and Varnishes Store
Parking Lot
Patio Homes

Conditional
Photofinishing Laboratory
Post Office
Postal Facilities
Sports and Recreation Club
Tennis Club
Flood Management Structure
Telephone Sub Station
Electrical Sub Station

Source: Compiled by the Consultants

Restricted Uses

All uses except permitted and conditionally permitted uses are restricted in this zone.

General Industrial Zone

Landuse Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table No. A.3: Landuse Permitted

Permitted
Confectionery Shop
Bank & Financial Institution
Bicycle Assembly, Parts and Accessories
Blacksmith
Bus Passenger Shelter
Communication Tower Within Permitted Height
Freight Transport Facility
Police Box \ Barrack
Fire \ Rescue Station
Grocery Store
Household Appliance and Furniture Repair Service
Machine Sheds
Meat and Poultry (Packing & Processing)
Mosque, Place Of Worship
Newspaper Stand
Photocopying and Duplicating Services
Pipelines and Utility Lines
Printing, Publishing and Distributing
Public Transport Facility
Restaurant
Retail Shops \ Facilities
Salvage Processing

Permitted
Salvage Yards
Satellite Dish Antenna
Sawmill, Chipping and Pallet Mill
Shelter (Passers By)
Television, Radio or Electronics Repair (No Outside Storage)
Transmission Lines
Truck Stop & Washing or Freight Terminal
Utility Lines
Wood Products
Woodlot
ATM Booth
Water Pump \ Reservoir
Effluent Treatment Plant
Social Forestry

Source: Compiled by the Consultants

Landuse Conditionally Permitted

The following uses may be permitted or denied in this zone after review and approval by the authority/committee following appropriate procedure.

Table No. A.4: Landuse Conditionally Permitted

Conditional
Amusement and Recreation (Indoors)
Appliance Store
Plantation (Except Narcotic Plant)
Cyber Café
Daycare Center (Commercial or Nonprofit)
Doctor \ Dentist Chamber
Electrical and Electronic Equipment and Instruments Sales
Employee Housing
Energy Installation
Fast Food Establishment \ Food Kiosk
Garages
Grain & Feed Mills
Incineration Facility
Super Store
Lithographic or Print Shop
Motor Vehicle Fuelling Station \ Gas Station
Motorcycle Sales Outlet
Outdoor Fruit and Vegetable Markets
Outside Bulk Storage

Conditional
Overhead Water Storage Tanks
Painting and Wallpaper Sales
Paints and Varnishes
Parking Lot
Parking Lot (Commercial)
Private Garages
Retail Shops Ancillary To Studio \ Workshop
Jute Mill

Source: Compiled by the Consultants

Restricted Uses

All uses except permitted and conditionally permitted uses.

Commercial Zone (Business)

Landuse Permitted

Commercial office zone is mainly intended for supporting the official works. There are several functions that are permitted in this zone.

Table No. A.5: Landuse Permitted

Permitted
Accounting, Auditing or Bookkeeping Services
Billboards, Advertisements & Advertising Structure
Agri-Business
Agricultural Sales and Services
Ambulance Service
Antique Shop
Appliance Store
Auction Market
Auditorium, Coliseum, Meeting Halls, and Conference Facilities, Convention
Auto Leasing or Rental Office
Auto Paint Shop
Auto Parts and Accessory Sales (Indoors)
Auto Repair Shop (With Garage)
Automobile Wash
Automobile Sales
Confectionery Shop
Bakery or Confectionery Retail
Bank & Financial Institution
Bar (Licensed)
Barber Shop

Permitted
Beauty and Body Service
Bicycle Shop
Billiard Parlor \ Pool Hall
Book or Stationery Store or Newsstand
Building Material Sales or Storage (Indoors)
Bulk Mail and Packaging
Bus Passenger Shelter
Cinema Hall
Communication Service Facilities
Communication Tower Within Permitted Height
Computer Maintenance and Repair
Computer Sales & Services
Conference Center
Construction Company
Courier Service
Cyber Café
Daycare Center (Commercial or Nonprofit)
Department Stores, Furniture & Variety Stores
Doctor \ Dentist Chamber
Drug Store or Pharmacy
Electrical and Electronic Equipment and Instruments Sales
Fast Food Establishment \ Food Kiosk
Freight Handling, Storage & Distribution
Freight Transport Facility
Freight Yard
General Store
Grocery Store
Guest House
Hotel or Motel
Inter-City Bus Terminal
Jewelry and Silverware Sales
Junk \ Salvage Yard
Super Store
Market (Bazar)
Mosque, Place Of Worship
Motorcycle Sales Outlet
Multi-Storey Car Park
Newspaper Stand
Outdoor Fruit and Vegetable Markets
Outdoor Recreation, Commercial

Permitted
Parking Lot (Commercial)
Pet Store
Photocopying and Duplicating Services
Photofinishing Laboratory & Studio
Pipelines and Utility Lines
Post Office
Preserved Fruits and Vegetables Facility \ Cold Storage
Printing, Publishing and Distributing
Project Identification Signs
Property Management Signs
Public Transport Facility
Refrigerator or Large Appliance Repair
Resort
Restaurant
Retail Shops \ Facilities
Salvage Processing
Salvage Yards
Satellite Dish Antenna
Sawmill, Chipping and Pallet Mill
Shelter (Passers By)
Shopping Mall \ Plaza
Slaughter House
Software Development
Sporting Goods and Toys Sales
Taxi Stand
Telephone Exchanges
Television, Radio or Electronics Repair (No Outside Storage)
Theater (Indoor)
Transmission Lines
Utility Lines
Vehicle Sales & Service, Leasing or Rental
Veterinarian Clinics, Animal Hospitals, Kennels and Boarding Facilities
Warehousing
Wood Products
Woodlot
ATM Booth
Water Pump \ Reservoir
Agro-Based Industry (Rice Mill, Saw Mill, Cold Storage)
Social Forestry

Source: Compiled by the Consultants

Landuse Conditionally Permitted

Some functions are permitted with some condition in this zone.

Table No. A.6: Landuse Conditionally Permitted

Conditional
Amusement and Recreation (Indoors)
Bicycle Assembly, Parts and Accessories
Broadcast Studio \ Recording Studio (No Audience)
Coffee Shop \ Tea Stall
Concert Hall, Stage Shows
Construction, Survey, Soil Testing Firms
Trade Shows
Craft Workshop
Plantation (Except Narcotic Plant)
Energy Installation
Firm Equipment Sales & Service
Agricultural Chemicals, Pesticides or Fertilizers Shop
Fitness Centre
Flowers, Nursery Stock and Florist Supplies
Forest Products Sales
Fuel and Ice Dealers
Garages
Garden Center or Retail Nursery
Police Box \ Barrack
Fire \ Rescue Station
Grain & Feed Mills
Household Appliance and Furniture Repair Service
Incineration Facility
Indoor Amusement Centers, Game Arcades
Indoor Theatre
Lithographic or Print Shop
Motor Vehicle Fuelling Station \ Gas Station
Musical Instrument Sales or Repair
Optical Goods Sales
Painting and Wallpaper Sales
Paints and Varnishes
Parking Lot
Patio Homes
Postal Facilities
Poultry
Private Garages
Professional Office

Conditional
Retail Shops Ancillary To Studio \ Workshop
Stone \ Cut Stone Products Sales

Restricted Uses

All uses except permitted and conditionally permitted uses.

Rural Settlement Zone

Landuse Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table No. A.7: Landuse Permitted

Permitted
Agricultural Dwellings
Animal Husbandry
Animal Shelter
Graveyard \ Cemetery
Child Daycare \ Preschool
Primary School
Communication Tower Within Permitted Height
Cottage
Crematorium
Dairy Firming
General Store
Grocery Store
Handloom (Cottage Industry)
Housing For Seasonal Firm Labor
Mosque, Place Of Worship
Newspaper Stand
Nursery School
orphanage
Outdoor Religious Events (Eidgah)
Playing Field
Satellite Dish Antenna
NGO \ CBO Facilities
Special Dwelling (E.G. Dorm For Physically Challenged Etc.)
Temporary Shed \ Tent
Specialized School: Dance, Art, Music, Physically Challenged & Others
Static Electrical Sub Stations
Transmission Lines
Utility Lines
Woodlot

Permitted
Plantation (Except Narcotic Plant)
Social Forestry
Memorial Structure

Source: Compiled by the Consultants

Landuse Conditionally Permitted

The following uses may be permitted or disallowed in this zone after review and approval by the authority/committee following appropriate procedure while the application meets the criteria mentioned in the requirement.

Table No. A.8: Landuse Conditionally Permitted

Conditional
Artisan's Shop (Potter, Blacksmith, and Goldsmith Etc.)
Research organization (Agriculture \ Fisheries)
Energy Installation
Fish Hatchery
Garden Center or Retail Nursery
Emergency Shelter
Sports and Recreation Club, Firing Range: Indoor

Source: Compiled by the Consultants

Restricted Uses

All uses except permitted and conditionally permitted uses are restricted in this zone.

Mixed use zone

Landuse Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table No. A.11: Landuse Permitted

Permitted
Accounting, Auditing or Bookkeeping Services
Addiction Treatment Center
Billboards, Advertisements & Advertising Structure
Agricultural Sales and Services
Antique Store
Appliance Store
Art Gallery, Art Studio \ Workshop
Artisan's Shop
Assisted Living or Elderly Home
Auditorium, Coliseum, Meeting Halls, and Conference Facilities, Convention

Permitted
Auto Leasing or Rental Office
Automobile Wash
Automobile Driving Academy
Confectionery Shop
Bakery or Confectionery Retail
Bank & Financial Institution
Barber Shop
Bicycle Shop
Billiard Parlor \ Pool Hall
Blacksmith
Boarding and Rooming House
Book or Stationery Store or Newsstand
Bus Passenger Shelter
Child Daycare \ Preschool
Cleaning \ Laundry Shop
Commercial Recreational Buildings
Communication Service Facilities
Communication Tower Within Permitted Height
Community Center
Condominium or Apartment
Correctional Institution
Courier Service
Cyber Café
Daycare Center (Commercial or Nonprofit)
Doctor \ Dentist Chamber
Employee Housing
Fabric Store
Fast Food Establishment \ Food Kiosk
Funeral Services
General Store
Grocery Store
Guest House
Hospital
Jewelry and Silverware Sales
Landscape and Horticultural Services
Mosque, Place Of Worship
Newspaper Stand
Nursery School
Photocopying and Duplicating Services
Pipelines and Utility Lines

Permitted
Primary School
Project Identification Signs
Property Management Signs
Public Transport Facility
Resort
Satellite Dish Antenna
Shelter (Passers By)
Shoe Repair or Shoeshine Shop (Small)
Slaughter House
Social organization
Software Development
Special Dwelling
Toys and Hobby Goods Processing and Supplies
Training Centre
Transmission Lines
Utility Lines
Vehicle Sales & Service, Leasing or Rental
Warehousing
Woodlot
Children's Park
ATM Booth
Water Pump \ Reservoir
Social Forestry
Dormitory
Rickshaw \ Auto Rickshaw Stand

Source: Compiled by the Consultants

Landuse Conditionally Permitted

The following uses may be permitted or disallowed in this zone after review and approval by the authority/committee.

Table No. A.12: Landuse Conditionally Permitted

Conditional
Agricultural Chemicals, Pesticides or Fertilizers Shop
Amusement and Recreation (Indoors)
Beauty and Body Service
Broadcast Studio \ Recording Studio (No Audience)
Building Maintenance \ Cleaning Services, No Outside Storage
Building Material Sales or Storage (Indoors)
Graveyard \ Cemetery
Coffee Shop \ Tea Stall

Conditional
Computer Maintenance and Repair
Computer Sales & Services
Concert Hall, Stage Shows
Conference Center
Construction Company
Construction, Survey, Soil Testing Firms
Cottage
Counseling Services
Craft Workshop
Crematorium
Plantation (Except Narcotic Plant)
Cultural Exhibits and Libraries
Department Stores, Furniture & Variety Stores
Drug Store or Pharmacy
Energy Installation
Fitness Centre
Flowers, Nursery Stock and Florist Supplies
Freight Handling, Storage & Distribution
Freight Transport Facility
Gaming Clubs
Garages
Garden Center or Retail Nursery
Commercial Office
Project Office
Government Office
Hotel or Motel
Household Appliance and Furniture Repair Service
Indoor Amusement Centers, Game Arcades
Indoor Theatre
Lithographic or Print Shop
Market (Bazar)
Health Office, Dental Laboratory, Clinic or Lab
Musical Instrument Sales or Repair
Optical Goods Sales
Outdoor Café
Outdoor Fruit and Vegetable Markets
Painting and Wallpaper Sales
Paints and Varnishes
Patio Homes
Photofinishing Laboratory & Studio

Conditional
Poultry
Printing, Publishing and Distributing
Psychiatric Hospital
Retail Shops Ancillary To Studio \ Workshop
Radio \ Television or T&T Station With Transmitter Tower
Refrigerator or Large Appliance Repair
Restaurant
Retail Shops \ Facilities
Sporting Goods and Toys Sales
Sports and Recreation Club, Firing Range: Indoor
Telephone Exchanges
Television, Radio or Electronics Repair (No Outside Storage)

Source: Compiled by the Consultants

Restricted Uses

All uses except permitted and conditionally permitted uses are restricted in this zone.

Institutional Zone

Landuse Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table No. A.13: Landuse Permitted

Permitted
Addiction Treatment Center
Billboards, Advertisements & Advertising Structure
Art Gallery, Art Studio \ Workshop
Automobile Driving Academy
Confectionery Shop
Bus Passenger Shelter
Child Daycare \ Preschool
College, University, Technical Institute
Communication Service Facilities
Communication Tower Within Permitted Height
Conference Center
Correctional Institution
Cultural Exhibits and Libraries
Cyber Café
Freight Transport Facility
General Store
Grocery Store
High School

Permitted
Hospital
Lithographic or Print Shop
Mosque, Place Of Worship
Multi-Storey Car Park
Newspaper Stand
Nursery School
Outdoor Religious Events
Photocopying and Duplicating Services
Post Office
Primary School
Professional Office
Project Identification Signs
Property Management Signs
Public Transport Facility
Satellite Dish Antenna
School (Retarded)
Scientific Research Establishment
Shelter (Passers By)
Specialized School: Dance, Art, Music & Others
Training Centre
Transmission Lines
Utility Lines
Vocational, Business, Secretarial School
Woodlot
ATM Booth
Water Pump \ Reservoir
Social Forestry
Dormitory
Veterinary School \ College and Hospital

Source: Compiled by the Consultants

Landuse Conditionally Permitted

The following uses may be permitted or denied in this zone after review and approval by the authority/committee.

Table No. A.14: Landuse Conditionally Permitted

Conditional
Auditorium, Coliseum, Meeting Halls, and Conference Facilities, Convention
Bank & Financial Institution
Barber Shop
Boarding and Rooming House

Conditional
Book or Stationery Store or Newsstand
Coffee Shop \ Tea Stall
Counseling Services
Courier Service
Plantation (Except Narcotic Plant)
Daycare Center (Commercial or Nonprofit)
Doctor \ Dentist Chamber
Drug Store or Pharmacy
Fast Food Establishment \ Food Kiosk
Flowers, Nursery Stock and Florist Supplies
Gallery \ Museum
Garages
Indoor Theatre
orphanage
Outdoor Café
Parking Lot
Pipelines and Utility Lines
Postal Facilities
Psychiatric Hospital

Source: Compiled by the Consultants

Restricted Uses

All uses except permitted and conditionally permitted uses are restricted in this zone.

Administrative Zone

Landuse Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table No. A.15: Landuse Permitted

Permitted
Accounting, Auditing or Bookkeeping Services
Billboards, Advertisements & Advertising Structure
Confectionery Shop
Bus Passenger Shelter
Civic Administration
Communication Service Facilities
Communication Tower Within Permitted Height
Construction, Survey, Soil Testing Firms
Cultural Exhibits and Libraries
Cyber Café
Emergency Shelter
Freight Transport Facility

Permitted
General Store
Project Office
Government Office
Grocery Store
Guest House
Multi-Storey Car Park
Newspaper Stand
Outdoor Religious Events
Photocopying and Duplicating Services
Post Office
Professional Office
Public Transport Facility
Satellite Dish Antenna
Scientific Research Establishment
Shelter (Passers By)
Training Centre
Transmission Lines
Utility Lines
Woodlot
ATM Booth
Water Pump \ Reservoir
Social Forestry

Source: Compiled by the Consultants

Landuse Conditionally Permitted

The following uses may be permitted or denied in this zone after review and approval by the authority/committee.

Table No. A.16: Landuse Conditionally Permitted

Conditional
Amusement and Recreation (Indoors)
Auditorium, Coliseum, Meeting Halls, and Conference Facilities, Convention
Bank & Financial Institution
Boarding and Rooming House
Book or Stationery Store or Newsstand
Coffee Shop \ Tea Stall
Conference Center
Courier Service
Plantation (Except Narcotic Plant)
Daycare Center (Commercial or Nonprofit)
Detention Facilities

Conditional
Doctor \ Dentist Chamber
Energy Installation
Fast Food Establishment \ Food Kiosk
Flowers, Nursery Stock and Florist Supplies
Freight Handling, Storage & Distribution
Freight Yard
Gallery \ Museum
Garages
Police Box \ Barrack
Fire \ Rescue Station
Lithographic or Print Shop
Mosque, Place Of Worship
Outdoor Café
Parking Lot
Parking Lot (Commercial)
Pipelines and Utility Lines
Postal Facilities

Source: Compiled by the Consultants

Restricted Uses

All uses except permitted and conditionally permitted uses are restricted in this zone.

Agricultural Zone

Landuse Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table No. A.17: Landuse Permitted

Permitted
Food Grain Cultivation
Vegetable Cultivation
Cash Crop Cultivation
Horticulture
Arboriculture
Dairy Firming
Deep Tube Well
Shallow Tube Well
Irrigation Facilities (Irrigation Canal, Culvert, Flood Wall etc)
Temporary Structure (Agricultural)
Animal Shelter
Duckery
Aquatic Recreation Facility (Without Structure)
Tree Plantation (Except Narcotic Plant)

Permitted
Aquaculture
Static Transformer Stations
Transmission Lines
Utility Lines
Woodlot
Social Forestry

Source: Compiled by the Consultants

Landuse Conditionally Permitted

Table No. A.18: Landuse Conditionally Permitted

Conditional
Graveyard \ Cemetery
Communication Tower Within Permitted Height
Crematorium
Fish Hatchery
Garden Center or Retail Nursery
Poultry

Source: Compiled by the Consultants

Restricted Uses

All uses except permitted and conditionally permitted uses are restricted in this zone.

Open Space

Landuse Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table No. A.19: Landuse Permitted

Permitted
Botanical Garden & Arboretum
Bus Passenger Shelter
Caravan Park \ Camping Ground
Carnivals and Fairs
Circus
Plantation (Except Narcotic Plant)
Landscape and Horticultural Services
Open Theater
Park and Recreation Facilities (General)
Pipelines and Utility Lines
Playing Field
Special Function Tent
Tennis Club
Transmission Lines
Urban-Nature Reserve

Permitted
Utility Lines
Woodlot
Zoo
Roadside Parking
Social Forestry
Memorial Structure

Source: Compiled by the Consultants

Landuse Conditionally Permitted

Table No. A.20: Landuse Conditionally Permitted

Conditional
Communication Tower Within Permitted Height
Trade Shows
Fitness Centre
Flowers, Nursery Stock and Florist Supplies
Golf Course
Motorized Recreation
Outdoor Recreation Facilities
Outdoor Recreation, Commercial
Outdoor Sports and Recreation
Park Maintenance Facility
Retreat Center
Sports and Recreation Club, Firing Range: Indoor

Source: Compiled by the Consultants

Restricted Uses

All uses except permitted and conditionally permitted uses are restricted.

Water Retention Area

Retaining water is the main purpose of this type of Landuse.

Landuse Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table No. A.21: Landuse Permitted

Permitted
Aquatic Recreation Facility (Without Structure)
Fishing Club
Utility Lines
Water Parks
Memorial Structure

Source: Compiled by the Consultants

Landuse Conditionally Permitted

The following uses may be permitted or denied in this zone after review and approval by the authority/committee.

Table No. A.22: Landuse Conditionally Permitted

Conditional
Plantation (Except Narcotic Plant)
Marina \ Boating Facility
Motorized Recreation

Source: Compiled by the Consultants

Water body

Landuse Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table No. A.23: Landuse Permitted

Permitted
Aquatic Recreation Facility (Without Structure)
Fishing Club
Utility Lines
Water Parks
Memorial Structure

Source: Compiled by the Consultants

Landuse Conditionally Permitted

The following uses may be permitted or denied in this zone after review and approval by the authority/committee.

Table No. A.24: Landuse Conditionally Permitted

Conditional
Plantation (Except Narcotic Plant)
Marina \ Boating Facility
Motorized Recreation

Source: Compiled by the Consultants

Restricted Uses

All uses except permitted and conditionally permitted uses are restricted.

ANNEXURE-C

Resolution of Final Consultation Meeting and Attendance List.

ANNEXURE-D
Detailed of Road Network Proposal

Road ID	Width(Feet)	Length(M)	Ward	Phase	Type
RP01	100	2,851.65	Extension Area-4	2nd	Widening
RP01	100	150.74	Ward No. 09	2nd	Widening
RP01	100	161.23	Ward No. 05	2nd	Widening
RP01	100	1,178.99	Ward No. 01	2nd	Widening
RP01	100	783.81	Ward No. 06	2nd	Widening
RP01	100	83.56	Ward No. 07	2nd	Widening
RP02	100	15.02	Extension Area-4	3rd	New
RP02	100	1,563.73	Ward No. 08	3rd	New
RP02	100	240.46	Extension Area 01	3rd	New
RP02	100	16.23	Extension Area 03	3rd	New
RS03	60	754.80	Ward No. 03	1st	Widening
RS03	60	181.60	Ward No. 01	1st	Widening
RS04	60	15.87	Outsite Pou	1st	Widening
RS04	60	1,695.31	Ward No. 09	1st	Widening
RS04	60	138.14	Ward No. 08	1st	Widening
RS05	40	292.24	Ward No. 03	2nd	Widening
RS05	40	1.99	Ward No. 01	2nd	Widening
RS06	40	314.55	Ward No. 03	2nd	Widening
RS07	40	218.82	Extension Area-4	2nd	Widening
RS07	40	122.65	Ward No. 03	2nd	Widening
RS08	40	522.80	Ward No. 04	1st	Widening
RS08	40	226.14	Ward No. 05	1st	Widening
RS08	40	215.67	Ward No. 03	1st	Widening
RS09	40	23.68	Ward No. 04	1st	Widening
RS09	40	447.01	Ward No. 05	1st	Widening
RS10	40	821.88	Ward No. 01	1st	Widening
RS10	40	0.45	Ward No. 06	1st	Widening
RS11	40	598.79	Ward No. 01	2nd	Widening
RS11	40	0.08	Ward No. 01	2nd	Widening
RS12	40	7.67	Extension Area-4	2nd	Widening
RS12	40	160.94	Ward No. 01	2nd	Widening
RS13	40	197.19	Ward No. 08	1st	Widening
RS13	40	893.33	Ward No. 05	1st	Widening
RS13	40	457.32	Ward No. 06	1st	Widening
RS13	40	68.17	Extension Area 01	1st	Widening
RS14	40	256.81	Ward No. 08	1st	Widening
RS14	40	4.45	Ward No. 06	1st	Widening
RS14	40	568.85	Ward No. 07	1st	Widening
RS15	40	552.09	Ward No. 06	2nd	Widening
RS16	40	14.91	Extension Area-4	1st	Widening
RS16	40	982.36	Ward No. 09	1st	Widening
RS17	40	14.40	Outsite Pou	1st	Widening
RS17	40	856.67	Ward No. 09	1st	Widening
RS17	40	99.83	Extension Area 03	1st	Widening
RS18	40	3.69	Outsite Pou	1st	Widening
RS18	40	1,117.68	Ward No. 07	1st	Widening
RS19	40	3.89	Ward No. 05	1st	Widening
RS19	40	2,457.28	Ward No. 06	1st	Widening
RS20	40	214.53	Ward No. 01	2nd	Widening
RS21	40	89.23	Ward No. 02	2nd	Widening
RS21	40	199.44	Ward No. 03	2nd	Widening
RS22	40	138.00	Ward No. 05	1st	Widening
RS22	40	833.81	Ward No. 01	1st	Widening
RS23	40	20.93	Extension Area-4	1st	Widening
RS23	40	781.22	Ward No. 03	1st	Widening

Road ID	Width(Feet)	Length(M)	Ward	Phase	Type
RS24	40	484.58	Ward No. 02	2nd	Widening
RS24	40	302.96	Ward No. 03	2nd	Widening
RS24	40	4.36	Ward No. 01	2nd	Widening
RS25	40	449.27	Ward No. 04	1st	Widening
RS25	40	449.97	Ward No. 05	1st	Widening
RS25	40	23.76	Ward No. 02	1st	Widening
RS26	40	101.82	Ward No. 01	2nd	Widening
RS27	40	8.08	Ward No. 05	2nd	Widening
RS27	40	262.69	Ward No. 01	2nd	Widening
RS28	40	651.56	Ward No. 06	2nd	Widening
RS29	40	377.47	Ward No. 09	2nd	Widening
RS29	40	6.68	Ward No. 08	2nd	Widening
RS29	40	177.62	Ward No. 08	3rd	New
RS30	40	265.91	Ward No. 09	3rd	New
RS31	40	158.90	Ward No. 05	2nd	Widening
RS32	40	4.81	Ward No. 04	2nd	Widening
RS32	40	116.62	Ward No. 02	2nd	Widening
RS32	40	2.23	Ward No. 03	2nd	Widening
RS33	40	539.23	Ward No. 05	1st	Widening
RS33	40	751.91	Ward No. 06	1st	Widening
RS33	40	11.24	Ward No. 07	1st	Widening
RS34	40	359.71	Ward No. 05	1st	Widening
RL35	30	210.96	Ward No. 03	2nd	Widening
RL36	30	12.51	Extension Area-4	2nd	Widening
RL36	30	276.96	Ward No. 03	2nd	Widening
RL37	30	191.24	Ward No. 03	2nd	Widening
RL38	30	146.07	Ward No. 03	2nd	Widening
RL39	30	162.78	Ward No. 02	2nd	Widening
RL39	30	4.60	Ward No. 03	2nd	Widening
RL40	30	223.05	Ward No. 01	2nd	Widening
RL41	30	67.41	Extension Area-4	2nd	Widening
RL41	30	212.46	Ward No. 01	2nd	Widening
RL42	30	213.67	Ward No. 01	2nd	Widening
RL43	30	353.53	Ward No. 01	2nd	Widening
RL43	30	0.71	Ward No. 06	2nd	Widening
RL43	30	228.63	Ward No. 04	2nd	Widening
RL43	30	7.87	Ward No. 05	2nd	Widening
RL45	30	4.40	Ward No. 05	2nd	Widening
RL45	30	334.81	Ward No. 06	2nd	Widening
RL46	30	3.33	Ward No. 05	2nd	Widening
RL46	30	731.33	Ward No. 06	2nd	Widening
RL47	30	423.70	Ward No. 06	3rd	New
RL48	30	365.98	Ward No. 06	3rd	New
RL49	30	171.89	Ward No. 06	2nd	Widening
RL50	30	241.41	Ward No. 03	2nd	Widening
RL51	30	169.65	Ward No. 02	2nd	Widening
RL51	30	4.07	Ward No. 03	2nd	Widening
RL52	30	184.62	Ward No. 02	2nd	Widening
RL52	30	6.57	Ward No. 03	2nd	Widening
RL53	30	195.10	Ward No. 01	2nd	Widening
RL54	30	324.85	Ward No. 04	2nd	Widening
RL55	30	101.02	Ward No. 04	2nd	Widening
RL56	30	2.07	Ward No. 08	2nd	Widening
RL56	30	547.15	Ward No. 05	2nd	Widening
RL57	30	71.29	Ward No. 08	2nd	Widening
RL57	30	275.30	Extension Area 01	2nd	Widening
RL58	30	4.79	Ward No. 05	2nd	Widening
RL58	30	232.18	Ward No. 06	2nd	Widening
RL59	30	4.95	Ward No. 05	2nd	Widening

Road ID	Width(Feet)	Length(M)	Ward	Phase	Type
RL59	30	230.87	Ward No. 06	2nd	Widening
RL60	30	522.55	Ward No. 08	2nd	Widening
RL60	30	18.25	Ward No. 05	2nd	Widening
RL60	30	5.11	Ward No. 07	2nd	Widening
RL61	30	330.80	Ward No. 08	2nd	Widening
RL61	30	4.71	Ward No. 07	2nd	Widening
RL62	30	196.83	Ward No. 08	2nd	Widening
RL63	30	124.03	Ward No. 09	2nd	Widening
RL63	30	682.13	Ward No. 08	2nd	Widening
RL64	30	760.62	Ward No. 09	3rd	New
RL64	30	14.50	Ward No. 08	3rd	New
RL64	30	315.30	Ward No. 09	2nd	Widening
RL65	30	800.06	Ward No. 09	3rd	New
RL66	30	5.43	Ward No. 09	2nd	Widening
RL66	30	158.62	Ward No. 08	2nd	Widening
RL67	30	19.45	Extension Area-4	3rd	New
RL67	30	8.96	Ward No. 06	2nd	Widening
RL67	30	580.47	Ward No. 07	2nd	Widening
RL67	30	2.08	Extension Area 02	2nd	Widening
RL67	30	357.44	Extension Area 02	3rd	New
RL68	30	340.38	Ward No. 07	2nd	Widening
RL69	30	5.46	Ward No. 06	2nd	Widening
RL69	30	419.64	Ward No. 07	2nd	Widening
RL70	30	18.08	Extension Area-4	3rd	New
RL70	30	230.31	Ward No. 07	3rd	New
RL70	30	321.25	Extension Area 02	3rd	Nwe
RL70	30	202.57	Ward No. 07	2nd	Widening
RL71	30	479.12	Ward No. 06	2nd	Widening
RL72	30	174.57	Ward No. 05	2nd	Widening
RL73	30	93.15	Ward No. 08	3rd	New
RL73	30	104.25	Ward No. 07	3rd	New
RL74	30	228.76	Ward No. 01	2nd	Widening
RL75	30	466.59	Ward No. 09	2nd	Widening
RL75	30	110.24	Ward No. 08	2nd	Widening
RL76	30	15.26	Extension Area-4	2nd	Widening
RL76	30	399.00	Ward No. 09	2nd	Widening
RL76	30	54.15	Ward No. 08	2nd	Widening
RL76	30	5.95	Extension Area 03	2nd	Widening
RL77	30	399.50	Ward No. 06	2nd	Widening
RL78	30	329.86	Ward No. 06	2nd	Widening
RA79	20	149.50	Ward No. 03	1st	Widening
RA79	20	5.86	Ward No. 01	1st	Widening
RA80	20	2.13	Ward No. 04	1st	Widening
RA80	20	465.30	Ward No. 02	1st	Widening
RA81	20	199.74	Ward No. 06	1st	Widening
RA82	20	239.04	Ward No. 01	3rd	New
RA83	20	199.04	Ward No. 02	1st	Widening
RA83	20	7.37	Ward No. 01	1st	Widening
RA84	20	154.26	Ward No. 02	1st	Widening
RA85	20	189.18	Ward No. 02	1st	Widening
RA86	20	109.16	Ward No. 02	1st	Widening
RA87	20	120.50	Ward No. 03	1st	Widening
RA88	20	152.25	Ward No. 02	1st	Widening
RA88	20	4.55	Ward No. 01	1st	Widening
RA89	20	129.73	Ward No. 04	3rd	New
RA90	20	466.25	Ward No. 04	3rd	New
RA91	20	143.20	Ward No. 06	1st	Widening
RA92	20	55.65	Ward No. 06	1st	Widening
RA93	20	3.69	Ward No. 05	1st	Widening

Road ID	Width(Feet)	Length(M)	Ward	Phase	Type
RA93	20	310.47	Ward No. 06	1st	Widening
RA94	20	5.28	Ward No. 08	1st	Widening
RA94	20	259.15	Ward No. 05	1st	Widening
RA95	20	234.94	Ward No. 05	1st	Widening
RA96	20	160.63	Ward No. 05	1st	Widening
RA97	20	413.73	Ward No. 08	1st	Widening
RA98	20	170.16	Ward No. 08	1st	Widening
RA99	20	206.00	Ward No. 08	1st	Widening
RA99	20	6.61	Ward No. 07	1st	Widening
RA100	20	286.18	Ward No. 08	1st	Widening
RA101	20	300.81	Ward No. 08	1st	Widening
RA102	20	103.59	Ward No. 08	1st	Widening
RA103	20	136.24	Ward No. 09	1st	Widening
RA104	20	352.38	Ward No. 09	1st	Widening
RA105	20	180.75	Ward No. 09	1st	Widening
RA106	20	271.35	Ward No. 09	1st	Widening
RA107	20	447.75	Ward No. 08	1st	Widening
RA107	20	93.23	Ward No. 07	1st	Widening
RA108	20	122.09	Ward No. 07	1st	Widening
RA109	20	337.23	Ward No. 07	1st	Widening
RA110	20	188.43	Ward No. 07	1st	Widening
RA111	20	3.75	Ward No. 06	1st	Widening
RA111	20	224.66	Ward No. 07	1st	Widening
RA112	20	213.18	Ward No. 07	1st	Widening
RA113	20	143.95	Ward No. 07	1st	Widening
RA114	20	92.48	Ward No. 07	1st	Widening
RA115	20	219.20	Ward No. 06	1st	Widening
RA116	20	227.00	Ward No. 06	1st	Widening
RA117	20	133.35	Ward No. 06	1st	Widening
RA118	20	173.70	Ward No. 06	1st	Widening
RA119	20	293.01	Ward No. 06	1st	Widening
RA120	20	11.09	Ward No. 04	3rd	New
RA120	20	309.36	Ward No. 05	3rd	New
RA121	20	104.83	Ward No. 05	3rd	New
RA121	20	51.54	Extension Area 01	3rd	New
RA122	20	158.44	Ward No. 06	3rd	New
RA123	20	153.46	Ward No. 06	3rd	New
RA124	20	130.16	Ward No. 04	1st	Widening
RA124	20	4.54	Ward No. 05	1st	Widening
RA125	20	230.21	Ward No. 07	1st	Widening
RA126	20	386.03	Ward No. 07	1st	Widening
RA127	20	101.16	Ward No. 07	1st	Widening
RA128	20	156.13	Ward No. 07	1st	Widening
RA129	20	64.76	Ward No. 07	1st	Widening
RA130	20	131.64	Ward No. 07	1st	Widening
RA131	20	394.90	Ward No. 09	1st	Widening
RA132	20	440.48	Ward No. 09	2nd	Widening
RA133	20	160.17	Ward No. 09	1st	Widening
RA133	20	2.78	Ward No. 08	1st	Widening
RA134	20	193.65	Ward No. 09	1st	Widening
RA135	20	162.81	Ward No. 09	1st	Widening
RA136	20	334.32	Ward No. 09	2nd	Widening
RA137	20	258.23	Ward No. 09	1st	Widening
RL138	30	352.97	Extension Area 02	2nd	W
RL139	30	15.71	Extension Area-4	2nd	W
RL139	30	61.14	Ward No. 07	2nd	W
RL139	30	289.52	Extension Area 02	2nd	W
Total		60,160.88			

Note: *W= widening, N= new*

ANNEXURE-E
Details of Drainage Network Proposal

ID	TYPE	Length(M)	Ward No	Phase
DP01	Primary	2,851.65	Extension Area-4	2nd
DP01	Primary	150.74	Ward No. 09	2nd
DP01	Primary	161.23	Ward No. 05	2nd
DP01	Primary	1,178.99	Ward No. 01	2nd
DP01	Primary	783.81	Ward No. 06	2nd
DP01	Primary	83.56	Ward No. 07	2nd
DP02	Primary	15.02	Extension Area-4	3rd
DP02	Primary	1,563.73	Ward No. 08	3rd
DP02	Primary	240.46	Extension Area 01	3rd
DP02	Primary	16.23	Extension Area 03	3rd
DP03	Primary	754.80	Ward No. 03	1st
DP03	Primary	181.60	Ward No. 01	1st
DP04	Primary	15.87	Outsite Pou	1st
DP04	Primary	1,695.31	Ward No. 09	1st
DP04	Primary	138.14	Ward No. 08	1st
DS05	Secondary	292.24	Ward No. 03	2nd
DS05	Secondary	1.99	Ward No. 01	2nd
DS06	Secondary	314.55	Ward No. 03	2nd
DS07	Secondary	218.82	Extension Area-4	2nd
DS07	Secondary	122.65	Ward No. 03	2nd
DS08	Secondary	522.80	Ward No. 04	1st
DS08	Secondary	226.14	Ward No. 05	1st
DS08	Secondary	215.67	Ward No. 03	1st
DS09	Secondary	23.68	Ward No. 04	1st
DS09	Secondary	447.01	Ward No. 05	1st
DS10	Secondary	821.88	Ward No. 01	1st
DS10	Secondary	0.45	Ward No. 06	1st
DS11	Secondary	388.43	Ward No. 01	2nd
DS11	Secondary	210.44	Ward No. 01	2nd
DS12	Secondary	7.67	Extension Area-4	2nd
DS12	Secondary	160.94	Ward No. 01	2nd
DS13	Secondary	197.19	Ward No. 08	1st
DS13	Secondary	893.33	Ward No. 05	1st
DS13	Secondary	457.32	Ward No. 06	1st
DS13	Secondary	68.17	Extension Area 01	1st
DS14	Secondary	256.81	Ward No. 08	1st
DS14	Secondary	4.45	Ward No. 06	1st
DS14	Secondary	568.85	Ward No. 07	1st
DS15	Secondary	552.09	Ward No. 06	2nd
DS16	Secondary	14.91	Extension Area-4	1st
DS16	Secondary	982.36	Ward No. 09	1st
DS17	Secondary	14.40	Extension Area-4	1st
DS17	Secondary	856.67	Ward No. 09	1st
DS17	Secondary	99.83	Extension Area 03	1st
DS18	Secondary	3.69	Extension Area-4	1st
DS18	Secondary	1,117.68	Ward No. 07	1st
DS19	Secondary	3.89	Ward No. 05	1st
DS19	Secondary	2,457.28	Ward No. 06	1st
DS20	Secondary	214.53	Ward No. 01	2nd
DS21	Secondary	89.23	Ward No. 02	2nd
DS21	Secondary	199.44	Ward No. 03	2nd
DS22	Secondary	138.00	Ward No. 05	1st
DS22	Secondary	833.81	Ward No. 01	1st
DS23	Secondary	20.93	Extension Area-4	1st
DS23	Secondary	781.22	Ward No. 03	1st

ID	TYPE	Length(M)	Ward No	Phase
DS24	Secondary	484.58	Ward No. 02	2nd
DS24	Secondary	302.96	Ward No. 03	2nd
DS24	Secondary	4.36	Ward No. 01	2nd
DS25	Secondary	449.27	Ward No. 04	1st
DS25	Secondary	449.97	Ward No. 05	1st
DS25	Secondary	23.76	Ward No. 02	1st
DS26	Secondary	101.82	Ward No. 01	2nd
DS27	Secondary	8.08	Ward No. 05	2nd
DS27	Secondary	262.69	Ward No. 01	2nd
DS28	Secondary	651.56	Ward No. 06	2nd
DS29	Secondary	377.47	Ward No. 09	2nd
DS29	Secondary	8.18	Ward No. 08	2nd
DS29	Secondary	176.13	Ward No. 08	3rd
DS30	Secondary	265.91	Ward No. 09	3rd
DS31	Secondary	158.90	Ward No. 05	2nd
DS32	Secondary	4.81	Ward No. 04	2nd
DS32	Secondary	116.62	Ward No. 02	2nd
DS32	Secondary	2.23	Ward No. 03	2nd
DS33	Secondary	539.23	Ward No. 05	1st
DS33	Secondary	751.91	Ward No. 06	1st
DS33	Secondary	11.24	Ward No. 07	1st
DS34	Secondary	359.71	Ward No. 05	1st
DT35	Tertiary	210.96	Ward No. 03	2nd
DT36	Tertiary	12.51	Extension Area-4	2nd
DT36	Tertiary	276.96	Ward No. 03	2nd
DT37	Tertiary	191.24	Ward No. 03	2nd
DT38	Tertiary	146.07	Ward No. 03	2nd
DT39	Tertiary	162.78	Ward No. 02	2nd
DT39	Tertiary	4.60	Ward No. 03	2nd
DT40	Tertiary	223.05	Ward No. 01	2nd
DT41	Tertiary	67.41	Extension Area-4	2nd
DT41	Tertiary	212.46	Ward No. 01	2nd
DT42	Tertiary	213.67	Ward No. 01	2nd
DT43	Tertiary	353.53	Ward No. 01	2nd
DT43	Tertiary	0.71	Ward No. 06	2nd
DT44	Tertiary	228.63	Ward No. 04	2nd
DT44	Tertiary	7.87	Ward No. 05	2nd
DT45	Tertiary	4.40	Ward No. 05	2nd
DT45	Tertiary	334.81	Ward No. 06	2nd
DT46	Tertiary	3.33	Ward No. 05	2nd
DT46	Tertiary	731.33	Ward No. 06	2nd
DT47	Tertiary	423.70	Ward No. 06	3rd
DT48	Tertiary	365.98	Ward No. 06	3rd
DT49	Tertiary	171.89	Ward No. 06	2nd
DT50	Tertiary	241.41	Ward No. 03	2nd
DT51	Tertiary	169.65	Ward No. 02	2nd
DT51	Tertiary	4.07	Ward No. 03	2nd
DT52	Tertiary	184.62	Ward No. 02	2nd
DT52	Tertiary	6.57	Ward No. 03	2nd
DT53	Tertiary	195.10	Ward No. 01	2nd
DT54	Tertiary	324.85	Ward No. 04	2nd
DT55	Tertiary	101.02	Ward No. 04	2nd
DT56	Tertiary	2.07	Ward No. 08	2nd
DT56	Tertiary	547.15	Ward No. 05	2nd
DT57	Tertiary	71.29	Ward No. 08	2nd
DT57	Tertiary	275.30	Extension Area 01	2nd
DT58	Tertiary	4.79	Ward No. 05	2nd
DT58	Tertiary	232.18	Ward No. 06	2nd
DT59	Tertiary	4.95	Ward No. 05	2nd

ID	TYPE	Length(M)	Ward No	Phase
DT59	Tertiary	230.87	Ward No. 06	2nd
DT60	Tertiary	522.55	Ward No. 08	2nd
DT60	Tertiary	18.25	Ward No. 05	2nd
DT60	Tertiary	5.11	Ward No. 07	2nd
DT61	Tertiary	330.80	Ward No. 08	2nd
DT61	Tertiary	4.71	Ward No. 07	2nd
DT62	Tertiary	196.83	Ward No. 08	2nd
DT63	Tertiary	124.03	Ward No. 09	2nd
DT63	Tertiary	682.13	Ward No. 08	2nd
DT64	Tertiary	759.94	Ward No. 09	3rd
DT64	Tertiary	14.50	Ward No. 08	3rd
DT64	Tertiary	315.98	Ward No. 09	2nd
DT65	Tertiary	800.06	Ward No. 09	3rd
DT66	Tertiary	5.43	Ward No. 09	2nd
DT66	Tertiary	158.62	Ward No. 08	2nd
DT67	Tertiary	19.45	Outsite Pou	3rd
DT67	Tertiary	8.96	Ward No. 06	2nd
DT67	Tertiary	580.47	Ward No. 07	2nd
DT67	Tertiary	2.31	Extension Area 02	2nd
DT67	Tertiary	357.21	Extension Area 02	3rd
DT68	Tertiary	340.38	Ward No. 07	2nd
DT69	Tertiary	5.46	Ward No. 06	2nd
DT69	Tertiary	419.64	Ward No. 07	2nd
DT70	Tertiary	18.08	Extension Area-4	3rd
DT70	Tertiary	231.59	Ward No. 07	3rd
DT70	Tertiary	321.25	Extension Area 02	3rd
DT70	Tertiary	201.30	Ward No. 07	2nd
DT71	Tertiary	479.12	Ward No. 06	2nd
DT72	Tertiary	174.57	Ward No. 05	2nd
DT73	Tertiary	93.15	Ward No. 08	3rd
DT73	Tertiary	104.25	Ward No. 07	3rd
DT74	Tertiary	228.76	Ward No. 01	2nd
DT75	Tertiary	466.59	Ward No. 09	2nd
DT75	Tertiary	110.24	Ward No. 08	2nd
DT76	Tertiary	15.26	Extension Area-4	2nd
DT76	Tertiary	399.00	Ward No. 09	2nd
DT76	Tertiary	54.15	Ward No. 08	2nd
DT76	Tertiary	5.95	Extension Area 03	2nd
DT77	Tertiary	399.50	Ward No. 06	2nd
DT78	Tertiary	329.86	Ward No. 06	2nd
DT79	Tertiary	149.50	Ward No. 03	1st
DT79	Tertiary	5.86	Ward No. 01	1st
DT80	Tertiary	2.13	Ward No. 04	1st
DT80	Tertiary	465.30	Ward No. 02	1st
DT81	Tertiary	199.74	Ward No. 06	1st
DT82	Tertiary	239.04	Ward No. 01	3rd
DT83	Tertiary	199.04	Ward No. 02	1st
DT83	Tertiary	7.37	Ward No. 01	1st
DT84	Tertiary	154.26	Ward No. 02	1st
DT85	Tertiary	189.18	Ward No. 02	1st
DT86	Tertiary	109.16	Ward No. 02	1st
DT87	Tertiary	120.50	Ward No. 03	1st
DT88	Tertiary	152.25	Ward No. 02	1st
DT88	Tertiary	4.55	Ward No. 01	1st
DT89	Tertiary	129.73	Ward No. 04	3rd
DT90	Tertiary	466.25	Ward No. 04	3rd
DT91	Tertiary	143.20	Ward No. 06	1st
DT92	Tertiary	55.65	Ward No. 06	1st
DT93	Tertiary	3.69	Ward No. 05	1st

ID	TYPE	Length(M)	Ward No	Phase
DT93	Tertiary	310.47	Ward No. 06	1st
DT94	Tertiary	5.28	Ward No. 08	1st
DT94	Tertiary	259.15	Ward No. 05	1st
DT95	Tertiary	234.94	Ward No. 05	1st
DT96	Tertiary	160.63	Ward No. 05	1st
DT97	Tertiary	413.73	Ward No. 08	1st
DT98	Tertiary	170.16	Ward No. 08	1st
DT99	Tertiary	206.00	Ward No. 08	1st
DT99	Tertiary	6.61	Ward No. 07	1st
DT100	Tertiary	286.18	Ward No. 08	1st
DT101	Tertiary	300.81	Ward No. 08	1st
DT102	Tertiary	103.59	Ward No. 08	1st
DT103	Tertiary	136.24	Ward No. 09	1st
DT104	Tertiary	352.38	Ward No. 09	1st
DT105	Tertiary	180.75	Ward No. 09	1st
DT106	Tertiary	271.35	Ward No. 09	1st
DT107	Tertiary	447.75	Ward No. 08	1st
DT107	Tertiary	93.23	Ward No. 07	1st
DT108	Tertiary	122.09	Ward No. 07	1st
DT109	Tertiary	337.23	Ward No. 07	1st
DT110	Tertiary	188.43	Ward No. 07	1st
DT111	Tertiary	3.75	Ward No. 06	1st
DT111	Tertiary	224.66	Ward No. 07	1st
DT112	Tertiary	213.18	Ward No. 07	1st
DT113	Tertiary	143.95	Ward No. 07	1st
DT114	Tertiary	92.48	Ward No. 07	1st
DT115	Tertiary	219.20	Ward No. 06	1st
DT116	Tertiary	227.00	Ward No. 06	1st
DT117	Tertiary	133.35	Ward No. 06	1st
DT118	Tertiary	173.70	Ward No. 06	1st
DT119	Tertiary	293.01	Ward No. 06	1st
DT120	Tertiary	11.09	Ward No. 04	3rd
DT120	Tertiary	309.36	Ward No. 05	3rd
DT121	Tertiary	104.83	Ward No. 05	3rd
DT121	Tertiary	51.54	Extension Area 01	3rd
DT122	Tertiary	158.44	Ward No. 06	3rd
DT123	Tertiary	153.46	Ward No. 06	3rd
DT124	Tertiary	130.16	Ward No. 04	1st
DT124	Tertiary	4.54	Ward No. 05	1st
DT125	Tertiary	230.21	Ward No. 07	1st
DT126	Tertiary	386.03	Ward No. 07	1st
DT127	Tertiary	101.16	Ward No. 07	1st
DT128	Tertiary	156.13	Ward No. 07	1st
DT129	Tertiary	64.76	Ward No. 07	1st
DT130	Tertiary	131.64	Ward No. 07	1st
DT131	Tertiary	394.90	Ward No. 09	1st
DT132	Tertiary	440.48	Ward No. 09	2nd
DT133	Tertiary	160.17	Ward No. 09	1st
DT133	Tertiary	2.78	Ward No. 08	1st
DT134	Tertiary	193.65	Ward No. 09	1st
DT135	Tertiary	162.81	Ward No. 09	1st
DT136	Tertiary	334.32	Ward No. 09	2nd
DT137	Tertiary	258.23	Ward No. 09	1st
DT138	Tertiary	352.95	Extension Area 02	2nd
DT139	Tertiary	15.71	Extension Area-4	2nd
DT139	Tertiary	61.14	Ward No. 07	2nd
DT139	Tertiary	289.53	Extension Area 02	2nd
		60,160.89		

ANNEXURE-F
Mouza Schedule of Development Proposal

Proposed Facilitiles	Ward Name	CS Mouza Name	Plot No.	Area in Acre
Residential				
Low Income Houseing Area	Ward No. 06	Batikamara	501-511, 530-531, 534 part, 535-539, 1295-1300, 1303, 1304, 1526-1527, 1576-1586, 1823-1828, 1829 part, 1823-1838	13.122
Re-Settlement Residential Zone	Ward No. 05	Serkandi	1847-1850, 1852-1857, 1863, 1865	24.955
		Teparia	55	
	Extension Area-1			
Planned Residential Area-1	Ward No. 01	Uday Bishnupur	1-26, 53, 101-122, 124-126, 135, 144	20.141
Planned Residential Area-2	Ward No. 01	Uday Bishnupur	30-50, 54, 55-57	8.649
		Elangi	359-367	
Commercial Facility				
Wholesale Market	Ward No. 08	Khayerchara	5, 6-7 part, 9 part, 17-18, 19 part, 43 part, 70-73 part, 74, 75-77 part, 84-85, 88, 89 part, 90, 91-92 part	4.494
Poura New Market	Ward No. 06	Serkandi	253-255, 256 part, 257-263	4.593
Cattle Market	Ward No. 06	Batikamara	2013 part, 2039 part, 204-2042	1.314
Transportation				
Track Terminal & Loading & Unloading	Ward No. 07	Khayerchara	27 part, 51-55, 58-67	2.70
	Ward No. 08		24 part, 68-69, 71-72 part	3.72
Tempo Stand	Ward No. 01	Kumarkhali	256-257 part	0.377
Educational Institution				
Pourashava Collegiate School	Ward No. 08	Batikamara	4457, 4460-4462 part, 4463, 4464 part, 4465, 4466-4467 part, 4468, 4469 part, 4470-4474, 4475 part, 4476-4478, 4737 part, 5054-5056 part	7.782
Vocational Training Institution	Ward No. 07	Batikamara	4732, 4736, 4737 part,	3.129
		Khayerchara	25-26, 27-28 part	
	Ward No. 08	Batikamara	5054-5056 part	2.912
		Khayerchara	20-23, 24 part	
Open Spce				
Central Park Cum Stadium	Ward No. 06	Batikamara	1255-1260, 1266, 1277-1279, 1282, 1286-1287, 1291-1293, 1311, 1312 part, 1318 part, 1320 part, 1399	8.165

Proposed Facilitiles	Ward Name	CS Mouza Name	Plot No.	Area in Acre
Community Park-1	Ward No. 09	Agrakunda	215, 218-224, 225 part, 364	1.800
Community Park-2	Ward No. 07	Batikamara	4323	1.392
Community Park-3	Ward No. 03	Elangi	3321, 3323-3327 part	0.409
Community Park-4	Ward No. 05	Serkandi	1839-1841	1.710
Playground	Ward No. 09	Khayerchar	841, 844-862, 863 part, 871-872, 874 part	6.320
Poura Shisu Park	Ward No. 08	Batikamara	4429 part, 4436 part, 4459-4460 part, 5008-5017	4.685
Utility & service facility				
Dumping Site	Ward No. 09	Khayerchara	704-711, 712 part, 716-717	3.287
Public Toilet-1	Ward No. 08	Khayerchara	92 part, 93 part, 94 part	1.000
Public Toilet-2	Ward No. 06	Serkandi	112 part	0.112
Public Toilet-3	Ward No. 01	Kumarkhali	213	0.145
Water Pump Station	Ward No. 05	Serkandi	1774 part	0.257
Slatter House	Ward No. 06	Batikamara	2013 part, 2038 part	0.254
Industrial				
General Industrial Zone	Ward No. 09	Khayerchara	143, 144 part, 145-215, 218, 286-309, 324-326, 444-448, 470, 506-511, 513-570	54.320
	Extension Area 03			7.704
Helath Facilities				
Hospital Zone	Ward No. 08	Batikamara	5018-5022, 5023 part, 5024-5031, 5036-5037, 5038-5039 part, 5040	4.71
Urban Deffard				
Urban Defferd	Ward No. 09	Khayerchara	222 part, 224, 227-228, 231-244, 246 part, 248 part, 251 part, 253-283, 317-325, 326-329 part, 330-334, 336-353, 365-366, 433-474, 448 part, 459 part, 460,	33.626
Community Facilities				
Community Center	Ward No. 06	Serkandi	307 part	0.289
Poura Central Mosque & Graveyard	Ward No. 06	Batikamara	1282-1285, 1289-1290 1330, 1519-1525, 1529-1530	5.426
Cremation	Ward No. 05	Serkandi	1407 part	0.460
Ward Center	Ward No. 01	Kumarkhali	225	0.154
	Ward No. 02	Elangi	514-515, 643 part, 647, 653-654	0.493
	Ward No. 03	Elangi	2870 part	0.153

Proposed Facilitiles	Ward Name	CS Mouza Name	Plot No.	Area in Acre
	Ward No. 04	Kumarkhali	1100 part, 1101, 1102 part	0.144
	Ward No. 05	Serkandi	1622	0.151
	Ward No. 06	Serkandi	248 part, 249 part, 254 part	0.166
	Ward No. 07	Batikamara	3417-3418 part	0.171
	Ward No. 08	Batikamara	3965 part	0.222
	Ward No. 09	Tebaria	469 part, 471-472 part, 473, 491 part	0.187

ANNEXURE-G
Mouza Schedule of Water Retention Pond

Ward No	CS Mouza Name	Plot No.	Area in Acres
Ward No. 01	Uday Bishnupur_086_01	A Part of 27, 29, 31-40, 44, 46-47, 55	25.24
	Uday Bishnupur_086_02	A Part of 129, 131, 136, 141, 150-151, 164	
	Elangi_085_03	A Part of 95, 366, 392	
	Bujruj Durgapur_140_00	A Part of 692, 694, 696-700, 702-705, 710-713, 725, 726-728, 730, 732-734, 740, 749-752, 756, 824, 902-903, 906, 910-911	
	Kumarkhali_087_01	A Part of 13-14, 24, 34-35, 47, 65, 70, 78-81, 83-84, 93-94, 96, 99, 100-104	
	Kumarkhali_087_02	A Part of 224-226, 230, 233, 236, 239-245, 249-258, 266-267, 273-275, 280, 285, 304, 310, 320, 324	
	Serkandi_088_01	A Part of 1, 3, 15, 20	
Ward No. 02	Elangi_085_03	A Part of 477, 485, 492, 505-506	3.49
	Elangi_085_08	A Part of 3062	
	Elangi_085_09	A Part of 503, 514, 573, 582, 608	
Ward No. 03	Elangi_085_03	424 part, 432 part, 457 part, 458 part, 472	5.65
	Elangi_085_08	A Part of 2018, 2020, 2825, 2830, 2845, 2846, 2851, 2869, 2874, 2882, 2888, 2891, 2897, 2910-2911, 2913, 2920, 3322	
	Elangi_085_10	A Part of 3323-3326, 3332	
Ward No. 04	Kumarkhali_087_06	A Part of 1019, 1049, 1052, 1054	1.43
Ward No. 05	Bujruj Durgapur_140_00	A Part of 911, 913-914	13.97
	Serkandi_088_01	A Part of 1-5, 10-11	
	Serkandi_088_04	A Part of 1203, 1205-1207, 1211, 1214-1215, 1222, 1225, 1228, 1232, 1235-1239, 1250, 1276, 1335, 1337, 1341, 1343-1344, 1360-1361,	
	Serkandi_088_05	A Part of 1639, 1769, 1877-1878	
	Serkandi_088_06	2566, 2575, 2592	
Ward No. 06	Bujruj Durgapur_140_00	A Part of 803-804, 806, 809-818, 823, 825, 827, 829, 851-855, 860-861, 866-867, 874, 879, 884-895, 922-923	70.60
	Batikamara_081_04	A Part of 501-504, 508, 511-512, 517-518, 520, 523-525, 538-539, 542, 544	
	Batikamara_081_05	A Part of 1206, 1209-1213, 1227, 1254, 1262, 1276, 1287, 1322-1325	
	Batikamara_081_06	A Part of 1504-1506, 1509-1511, 1534-1536, 1546-1547, 1549, 1555-1556, 1558-1562, 1564, 1567, 1574, 1583	
	Batikamara_081_07	A Part of 1800, 1802, 1804-1805, 1808, 1810-1811, 1826-1827, 1831-1834, 1837-1839, 1841, 1851, 1853, 1858-1864, 1866-1870, 1872, 1874-1877, 1880, 1882-1886, 1888-1889	
	Batikamara_081_08	A Part of 2001-2007, 2012-2016, 2020, 2022-2024, 2026, 2028-2034, 2036-2048, 2050-2051, 2053, 2056-2059, 2100-2114	
	Batikamara_081_13	3771 Part	
	Serkandi_088-02	A Part of 104, 112, 122	
	Serkandi_088-03	A Part of 201-205, 209, 212-216, 219-225, 229-232, 241, 244-246, 248-250, 253-258, 260-261, 269, 271-272, 274-275, 285, 295-297, 299, 308, 311, 326, 331, 347, 358-360	
	Serkandi_088-05	1731-1732	
	Serkandi_088-06	A Part of 2504-2505, 2537, 2548-2551, 2554, 2557-2560, 2602	
Ward No. 07	Batikamara_081_12	A Part of 3403-3404, 3408, 3410, 3415, 3421-3422, 3434, 3436, 3450, 3454, 3471, 3473-3475, 3480, 3482, 3484, 3489, 3496-3497, 3504-3505, 3518, 3533, 3537, 3560-3561	9.35
	Batikamara_081_13	A Part of 3704, 3713-3714, 3726, 3732-3733, 3736-3737, 3742	
	Batikamara_081_15	A Part of 4321, 4324, 4349, 4354, 4359, 4383, 4403, 4442, 4444-4450	
	Batikamara_081_16	4740 part	

	Khayerchara_090_00	A Part of 33, 37, 49-52, 55, 61-62	
Ward No. 08	Batikamara_081_13	A Part, 3736-3767, 3773	16.17
	Batikamara_081_14	A Part of 3905, 3910, 3920, 3929, 3939-3940, 3956, 3960, 3971, 3981, 3988, 3992, 3996, 3999, 4003-4006, 4013, 4019, 4049, 4069	
	Batikamara_081_17	A Part, 5003-5004, 5006, 5009, 5012, 5014-5015	
	Tebaria_089_01	42	
	Tebaria_089_04	A Part of 303, 306	
	Khayerchara_090_00	A Part of 86, 94-95, 99-101, 105, 125-126	
Ward No. 09	Tebaria_089_04	294	16.77
	Tebaria_089_05	A Part of 423, 446-447, 462, 466. 477, 485498-500, 502, 514-515, 520	
	Tebaria_089_06	A Part of 601, 604, 649, 656, 664-673	
	Khayerchara_090_00	A Part of 31, 133, 146, 151-156, 162, 216, 222-223, 229, 246-247, 366-367, 372-374, 359, 391, 404, 406, 431, 449-451, 586, 668-670, 372-679, 681-682, 684-691, 706-707, 868-870826-828,	
	Khayerchara_098_00	A Part of 213, 216, 234, 237, 241, 245, 261-263, 284-297, 301-302, 304, 306, 319-320, 324-331,	

ANNEXURE-H
List of Photographs