Government of the People's Republic of Bangladesh

Local Government Division

Ministry of Local Government, Rural Development & Cooperatives

KALAPARA PAURASHAVA

MASTER PLAN: 2011-2031

December, 2014

Technical Assistance: Local Government Engineering Department (LGED)

Government of the People's Republic of Bangladesh

Local Government Division

Ministry of Local Government, Rural Development & Cooperatives

KALAPARA PAURASHAVA MASTER PLAN: 2011-2031

STRUCTURE PLAN

URBAN AREA PLAN:

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

WARD ACTION PLAN

December, 2014

KALAPARA PAURASHAVA

KALAPARA, PATUAKHALI

KALAPARA PAURASHAVA MASTER PLAN: 2011-2031

Published by:

KALAPARA PAURASHAVA

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Preface

Bangladesh has been experiencing rapid urbanization in the last four decades where level of urbanization has reached from 7.6% 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, Kalapara 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 Kalapara Paurashava.

Master Plan of Kalapara Paurashva has been prepared following the pre-requisite of the Local Government (Paurashva) Act, 2009. To prepare the Master Plan, LGED engaged consulting firm named Sheltech Consultants (Pvt.) Ltd in association with Design Planning and Management Consultants 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 & 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 Kalapara 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 Kalapara Paurashava will be necessary to implement this Master Plan successfully and make this Paurashava developed and livable. I hope Kalapara Paurashava will be a model Paurashava in Bangladesh through building itself green and sustainable by successful implementation of this Master Plan.

(S. M. Rakibul Ahsan)
Mayor
Kalapara Paurahsava.

EXECUTIVE SUMMARY

The presentation of this Master Plan Report is in compliance to the Terms of Reference for the preparation of Master plan for Kalapara Paurashava under the project titled “Upazila Town Infrastructure Development Project”. Kalapara was upgraded as B category Paurashava in 1997. It occupies an area of 3.82 sq. km and consists of 9 wards and 2 mauzas. At present the total population is almost 17332 of which 8887 are male and 8445 are female. Density of population is about 4537 persons per sq. km and literacy rate is about 51.8%.

The plan aims of preparing the master plan is to identify the infrastructural facilities needed for socio economic and physical development and activities of the people living in the Paurashava so to improve their living condition.

The Master plan has the three components- the Structure Plan, the Urban Area Plan and the Ward Action Plan. The **Structure Plan** basically concerned with the physical development of broad strategies for managing and promoting efficient urban development over the long term (2011-2031) and attempts to integrate economic, physical and environmental objectives. It also identifies the basic strategic options available to accommodate the anticipated growth. The Structure Plan also outlines major sector wise policies to guide development in the desired manner over a longer period of time (for 20 years).

Second Component is the **Urban Area Plan** which is synthesized with upper tier of the Plan, the Structure Plan. The Urban Area plan provide an interim mid-term strategy for 10 years (2011-2021) for the development, of the Paurashava following the broad guidelines set by the longer term structure plan. The plans can be prepared for specific sections of the urban area identified in the structure plan for rapid development or for special projects and improvements. It gives detailed information on the preferred development pattern, showing location of roads, infrastructure, community facilities and land use zones. Considering the development growth trends, an estimated growth rate for Kalapara Paurashava has been fixed at 1.62 % using Exponential formula. Urban Area Plan is comprised of four components that is Land use Plan, Transportation and Traffic Management Plan, Drainage and Environmental Management Plan and Plan for Urban Services.

Land Use Plan is mainly confined to the land use zoning. Total 19 categories of landuse zones have been identified in Kalapara Paurashava. About 36.62% lands are preserved for residential purpose and 1.65% of total area is reserved as Urban deferred. Relevant land development control regulations and necessary implementation guidelines have also been incorporated.

Transportation and Traffic Management Plan includes existing condition of transportation facilities, intensity of traffic volume, travel demand forecasting for next 20 years, future traffic volume and transportation development plan. In Transportation and Traffic Management Plan total 63.80 Km. road network have been proposed for circulation development of Kalapara Paurashava Moreover transportation system management and plan implementation strategies are also described in this plan.

Drainage and Environmental Management Plan is third part and subdivided into two segments- Drainage and Environment. Existing drainage network, land level, plan for drainage management and flood control, plan implementation strategies are also described in this plan. Total 57.94 Km. drain has been proposed for drainage network development of Kalapara Paurashava. Existing environmental condition, solid waste management, environmental pollution, plan for environmental management and plan implementation strategies are also included. Projection on existing and proposed urban services, have been provided in this plan.

The Third component is **Ward Action Plan (WAP)** where ward wise priority schemes, phasing of the schemes is made. Prioritization of no. of wards based on existing development pattern and need of development is also identified.

It is also mentioned here that the draft plan has been prepared on the basis of comments made by the PMO and the Paurashava. It is suggested that to follow up the plan proposals and recommendations of different sectors to keep balance with demand and supply of citizens' requirements. The Master Plan will facilitate the agglomeration of people with the view to provide all facilities that will be help full for boosting up their socioeconomic condition. It should be kept in mind that master plan is a guideline for development and control of growth in a systematic manner. Without proper regulation or rules it would not be possible to manage the Master Plan. However appropriate authority must be obligatory for the execution of the Master Plan.

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CHAPTER 1
INTRODUCTION

1.1 Introduction

Local Government Engineering Department (LGED), Ministry of Local Government, Rural Development and Cooperatives, Government of the People's Republic of Bangladesh has taken a massive program to prepare master plan of 223 Paurashavas and Kuakata Tourism Centre under the project titled Upazila Towns Infrastructure Development Project' (UTIDP) funded by the Government of Bangladesh. The aim of master plans for the Paurashavas is to identify the infrastructural facilitates needed for overall socio-economic and physical development and activities of the people living in the respective Paurashava so as improve their living conditions.

However, the main purpose of preparing master plan of Kalapara Paurashava is to prepare Land Use Plan and related Infrastructural Plans as envisaged in the Terms of Reference (TOR). The Master Plan of Kalapara Paurashava is to be prepared based on the topography survey, physical feature survey, land use survey, socio-economic survey and other different types of sector surveys/studies. However, the plan consists of three volumes known as Master Plan. These are:

- **Structure plan**
- **Urban Area Plan**
  -Landuse Plan
  - Transportation and Traffic Management Plan
  -Drainage and Environmental Management Plan
  -Plan for Urban Services
- **Ward Action Plan**

The following aspects have been addressed in preparing the master plan for Kalapara Paurashava:

- Guide/regulate planned development of infrastructure and facilities
- Facilitate socio-economic development activities
- Ensure conservation of natural streams and addressing properly environmental concerns
- Arrest existing unplanned growth
- Stop further encroachment of the fertile agricultural lands and potential beach areas
- Proper and optimal use of land
- Facilitate provision of utilities, services and facilities for the resident population
- Spatial layout for public sector, private sector and public- private sector investments
- Facilitate conservation of bio-diversity

1.2 Philosophy of the Master Plan

The master plan will facilitate the agglomeration of people of a defined place with the view to provide all supportive facilities for them that will be helpful for boosting up their socio-economic condition. Moreover, considerable care has to be given to improve their quality of life through providing some other facilities such as recreational, municipal facilities etc. But it should be kept in mind that master plan is a guideline for development and control of growth in a systematic manner. Without proper regulation or rules it would not be possible to manage the master plan. However, appropriate authority will be obligatory for the execution of the master plan.

1.3 Objectives of the Master Plan

According to the Terms of Reference (TOR) the objectives of the Master Plan are as follows:

- Find out problems and potentialities of developing various sectors
- Facilitating the provision for all types of infrastructure and service facilities needed for development as well as socio-economic facilities and infrastructure for the local people
- Supporting protection of the local environment/ecology
- Preparing a 20-year Master Plan used as tool to guide and regulate planned physical growth and development
- Facilitating job opportunities for the local people so as to address the issue of poverty reduction in line with the national policy of poverty reduction
- Keeping provision for short, medium and long-term investment plans by the public sector, the private sector and the PPP in implementing the Kalapara Paurashava plan.

1.4 Conceptualization

Structure Plan

The term Structure Plan includes a full analysis of the existing scenarios, highlight the existing condition of different sectoral infrastructures, identification of sectoral issues and interventions, prescription of solution for each sector and setting proposal and recommendations for the future action to be taken within the mentioned period, say 20 years. This is a longer-term plan.

Urban Area Plan

The term Urban Area Plan (UAP) is prepared for managing and promoting development over medium term on the basis of the strategies set by the longer-term structure plan. Basically the UAP is an interpretation of the Structure Plan over the medium term (10 years). The coverage of the UAP is existing urban areas and their immediate surroundings with the purpose of providing development guidance in these areas where most of the urban development activities are expected to take place over the next 10 years. Delineation of the Urban Area Plan should be based on the urban growth area as identified in the Structure Plan. It will contain more details about specific programs and policies that require to be implemented over the medium term. The UAP is consisted with the Land Use plan, Transportation and traffic Management plan, Drainage and Environmental Management Plan and Community Services Plan.

Ward Action Plan

This is called short-term plan, say 5 years. Individual Ward of the Paurashava is deserved scope of this plan. In the Paurashava, 9 Ward Action Plan is being prepared. The plan includes review of the existing situation of the Ward with respect to land use, community facilities, public services, utilities, infrastructures, etc. Problems need immediate attention and scope of development is the basis of this plan. The problems and their recommendations as prescribed in the Urban Area Plan are being emphasized for immediate implementation with the help of ward Action Plan.

1.5 Approach and Methodology

The project is aimed for development of infrastructure and services for the Paurashava with optimum provision of opportunities for local people and extending services to surrounding areas.

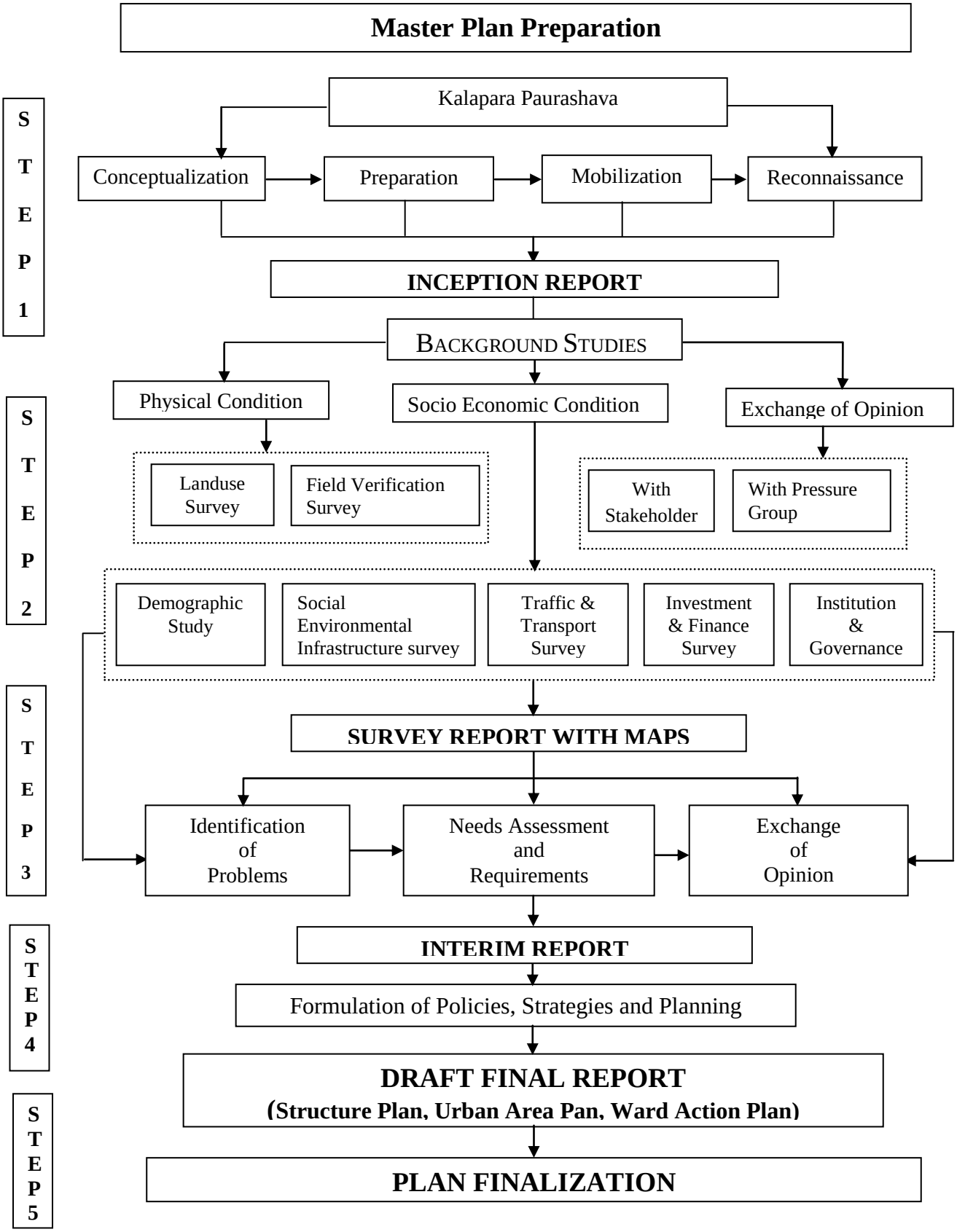


Figure 1.1: Diagram of Master Plan Preparation

1.5.1 Demarcation of the Planning Area

The demarcation of the study area is an important task in order to gather information and data. As per TOR, the study area or the planning area should be determined by the consultants reviewing its growth potential, geographical and geological context, tourism aspects and other relevant issues. Determining the planning area for Kalapara Paurashava, the consultants had exercised above issues and fixed the area of the Paurashava. The total area of the Kalapara Planning Area is 944.56 acres (3.82 sq. km.) and there is no extended area in the structure plan. However, in demarcating the study area, the following aspects have been considered:

- the existing and future road linkages
- physical growth directions
- physical features of the area and the surrounding areas

1.5.2 Preparation of the Base Map

The following steps have been followed to prepare the base map:

- Collection of RS Mouza Maps
- Identification of GCP (TIC) on Digitized Maps
- Scanning of Mouza Maps
- Edge Matching and Preparation of Study Area Map
- Digitization of RS Mouza Maps
- Edit Plot Check of Digitized Coverage
- Geo-referencing of Mouza Maps

1.5.3 Surveys

1.5.3.1 Topographic Survey

Topography survey was conducted by using RTK-GPS and Total Station (TS) survey technique. Topographic survey has included the following features:

- Land levels/spot levels for contours at 50m intervals with denser intervals for undulations;
- Alignment and crest levels (not exceeding 50m) of roads, embankments, dykes and other drainage divides;
- Alignment of rivers, lake, canal, drainage channels etc;
- Outline of bazars, water body, swamps and forest, etc;
- Type, width, length and name of road above flood level;
- For closed boundary/outline of homestead, water bodies, swamps, forest etc. junctions, spot heights or land levels will be taken roughly at 10m intervals in normal cases and contour will be at 0.3 meter interval;
- Crest levels will not exceed 50m along all dyke, roads and drainage divide.

1.5.3.2 Physical Feature Survey

Physical feature surveys provided the basis for understanding many planning problems. To know existing information about physical features of Kalapara Paurashava, physical feature survey was carried out. The physical features map was prepared on RS/CS map on 1''=165´ scale showing the following features:

- Cross Section, long section, type, width, length and name of road, road level above datum, slopes, flooding lands, slopes, borrow pit

- Identification of any bridge or culvert on the road with their length & width and span of the bridge, condition of abutments, condition of the deck, wing walls abutments;
- Type, size, inlet and outlet location of drain along with flow direction, width of the canal, place of encroachment;
- Type of sewer system, size, type and location of sewerage line, location of bins, identification of any other sewerage collection system;
- Identification of the water supply system, location of overhead water tank and its capacity, catchments area of overhead tank;
- Identification, location and capacity of electricity, telephone service;
- If any, new items identified during the survey period will also be surveyed;

1.5.3.3 Land use Survey

Utilizing the Base Map, (physical features survey overlay on survey map) the land use map was prepared indicating the broad categories of land uses. And it described using a suitable land use code reference. The characteristics of each land use area were described in the survey report. The Land Use Maps were prepared on the Base Map.

1.5.3.4 Socio-economic Survey

The planning principle directs towards people and their needs concerning housing, shopping, recreational, employment, education, and health services, etc. Detail information on population is essential for estimation of land requirement for future needs. It is also essential for allocating land between various competing uses.

A socio-economic survey for collection of primary data was conducted at Kalapara Paurashava. The sample size of socio-economic survey was 5% as per ToR. It is clearly understood that the purpose of this socio-economic survey is to obtain the project related socio-economic data on households in the project area. All data were collected from the primary sources through a specially designed socio-economic questionnaire survey.

1.5.3.5 Drainage and Environmental Study

The consultants have undertaken a drainage survey and environmental study at Kalapara Paurashava. The preparation of master plan for the next 20 years for the Paurashava seeks environmental investigation of development activities that will be undertaken in next 20 years. The issues/aspects that were investigated as per the TOR are as follows:

Existing Infrastructure

- Drainage
  - Man-made (drainage network, gradient, attachment area, out let)
  - Natural (flow direction, hydrology, usability)
- Water supply (network, coverage)
- Sewerage (location/network, condition)
- Solid waste management-existing system, location of garbage disposal, management aspect

Environmental Aspects

- Humidity, rainfall and temperature of the study area.
- Climatic and Disaster Condition, Soil and topographic Condition.
- Environmental Pollution (air, water and noise pollution).
- Identification of hazards.
- Existing mitigation/coping measures, if any.
- Identification of environmental protection laws/regulations.

1.5.4 Data and Information Management

All the data and information collected from the primary and secondary sources have been sorted/edited and computerized and analyzed. Projections were done in the case of populations so as to estimate the spatial requirements of different services and facilities for the resident population. All these were accomplished in line with the objectives of the plan so as to estimate the land requirements for different service and facilities. Elaborate information regarding projection and estimation of land requirements are available in the following concern chapters.

1.5.5 Adopted Planning Standards

The planning standard provided by the PMO office of UTIDP has followed to prepare the Master Plan.

1.5.6 Stakeholders' Consultations

After preparation of a draft plan, a consultation meeting has conducted with the concerned authority and local people of Kalapara Paurashava to acquire aspirations, demand, problem and prospects of the area and community as well as the views of service proving agencies and local administration and share the master plan with them. After incorporating their views and demands, the master plan has prepared.

1.6 Scope of the Work

The scope of the work is to cover all aspects related to the preparation of Master Plan / Urban Area Plan which include Land Use Plan, Traffic Management Plan, Drainage and Environment Plan and Ward Action Plan. Prepare a plan to set out proposed Master Plan at three levels namely Structural Plan, Master Plan / Urban Area Plan and Ward Action Plan. In order to prepare these plans following activities has been conducted:

- Visits to the Kalapara Paurashava have been made in different stages for the preparation of Master plan
- An inception meeting at the Paurashava level has been conducted to inform Paurashava about the scope of work for the preparation of Master Plan for 20 years development vision.
- The study area has been determined on the basis of existing condition demand of the Paurashava and the potentiality for future development.
- Different types of survey activities have been conducted from primary and secondary source.
- A comprehensive drainage master plan for a period of 20 years has been prepared.
- Assessing existing condition an integrated transportation plan is proposed for next 20 years
- Ward action plan with list of priority schemes for the development of roads parks and other social facilities are proposed which need to implement during the first five years of the plan period.
- Consultation meeting has been organized with the help of concerned Paurashava and local stakeholders.
- Master plan and report with required standard have been prepared and submitted as required TOR.

CHAPTER 2
STRUCTURE PLAN

2.1 Background of the Paurashava

Kalapara Upazila is situated in Patuakhali district. It is located between 21º48´ and 22º25´ north latitudes and between 90º05´ and 90º20´ east longitudes. The upazila is bounded on the north and the west by Amtali Upazila of Borguna district, on the east by Galachipa Upazila of Patuakhali district and on the south by the Bay of Bengal.

Kalapara, a Paurashava of Patuakhali district, is located at Kalapara Upazila in the southern part of the country. Kalapara became police station in 1928. It was upgraded to an upazila on the November, 1983. Kalapara Upazila consists of 9 wards, 9 Unions, 58 mauzas, 24 mahallas and 217 villages. The Paurashava was established 1st March, 1997, as a Paurashava and covers 2 mouzas (4 sheets). However, Kalapara Paurashava consists of 9 wards with an area 3.82 sq.km (Field Survey, 2010). The Paurashava is bounded on the north by Chakamaiya and Dhankhali Union of Kalapara Upazila, on the west by Tiakhali Union of Kalapara Upazila, on the south by Nilgani and Mithagonj Union of Kalapara Upazila and on the east by Lalua Union of Kalapara Upazila.

2.2 Vision of the Structure Plan

The vision of the Structure Plan is oriented with the policy development for the project area in relation with national and regional policies or framework through close liaison between planning authority and government departments. In a word, it will provide the basis of Co-coordinating decisions. It will be considered as the upper level planning guideline component for next two levels of planning i.e. Urban Area Plan and Ward Action Plan. Structure Plan will identify the urban growth area based on which the Master Plan area will be delineated. It will set policy framework which will be more detailed in Urban Area Plan. Moreover, it will provide the basis of development control in pursuing the Urban Area Plan. Subsequently, the indication of action areas and the nature of treatment in different sectors will also be considered here. It will define the location of action areas but not the boundaries, also the priority, possible effect of actions proposed. Pertaining with Action Area Plan, the combination of Public and Private Agency or individuals' involvement to implement the proposed actions will be stated here.

2.3 Objectives of the Structure Plan

The main objectives of preparing master plan of Kalapara Paurashava are to prepare Structure Plan, Urban Area Plan and Ward Action Plan as envisaged in the Terms of Reference (TOR). The structure plan has the following objectives:

- To identify the main development issues facing the Paurashava (town) with major opportunities and constraints
- To identify the growth and possible physical expansion of the city as foreseen considering economic base and Trend
- To provide a view of required and suitable lands for future physical expansion
- To develop the sector wise strategies pursuing the future development control in a desirable direction
- To identify the resources which are needed to strengthen the financial resources of the town
  - Establishment of inter sectoral goals, policies and general proposals for urban spatial development
  - Provide framework for the next hierarchy of Kalapara Paurashava Master plan and Ward action plan

2.4 Content and Format of Structure Plan

As per Terms of References (TORs) the Structure Plan of Kalapara Paurashava has been prepared for 20 years in long term. The Urban Area Plan (UAP) will be an interpretation of Structure Plan in Medium Term and Ward Action Plan in Short Term. Figure 2.1 shows the content of structure plan.

Demarcation of Structure Plan Area

The issues have been adopted for demarcating the study area for Kalapara Paurashava comprises the following:

- Study the existing Paurashava boundary with existing growth trend and pattern Analysis of the physical development constraints and potentialities
- Study of the existing and future national, regional and local linkages with Kalapara
- Consultation with local governments
- Consultation with local people, members of civil societies and other stakeholders

According to the gazette notification, the Kalapara Paurashava comprises two mouzas (4 sheets) namely– Khepupara and Badurtali. The total Paurashava area is about 944.56 acre (3.82 sq.km). The Paurashava area has considered enough to accommodate the future growth of the area and all the 9 wards of the paurashava are covered. The following table shows mouza wise area of Kalapara Paurashava.

Table 2.1: Mouza Wise Area of Kalapara Paurashava

Mouza Name	JL No.	Sheet No.	Map Category	Area	
				in Acre	in Sq.km
Khepupara	6	1, 2, 3	RS	716.55	2.89
Badurtali	7	3	RS	228.01	0.93
Total				944.56	3.82

Source: Consultant's estimation according to Physical Feature Survey 2010/211

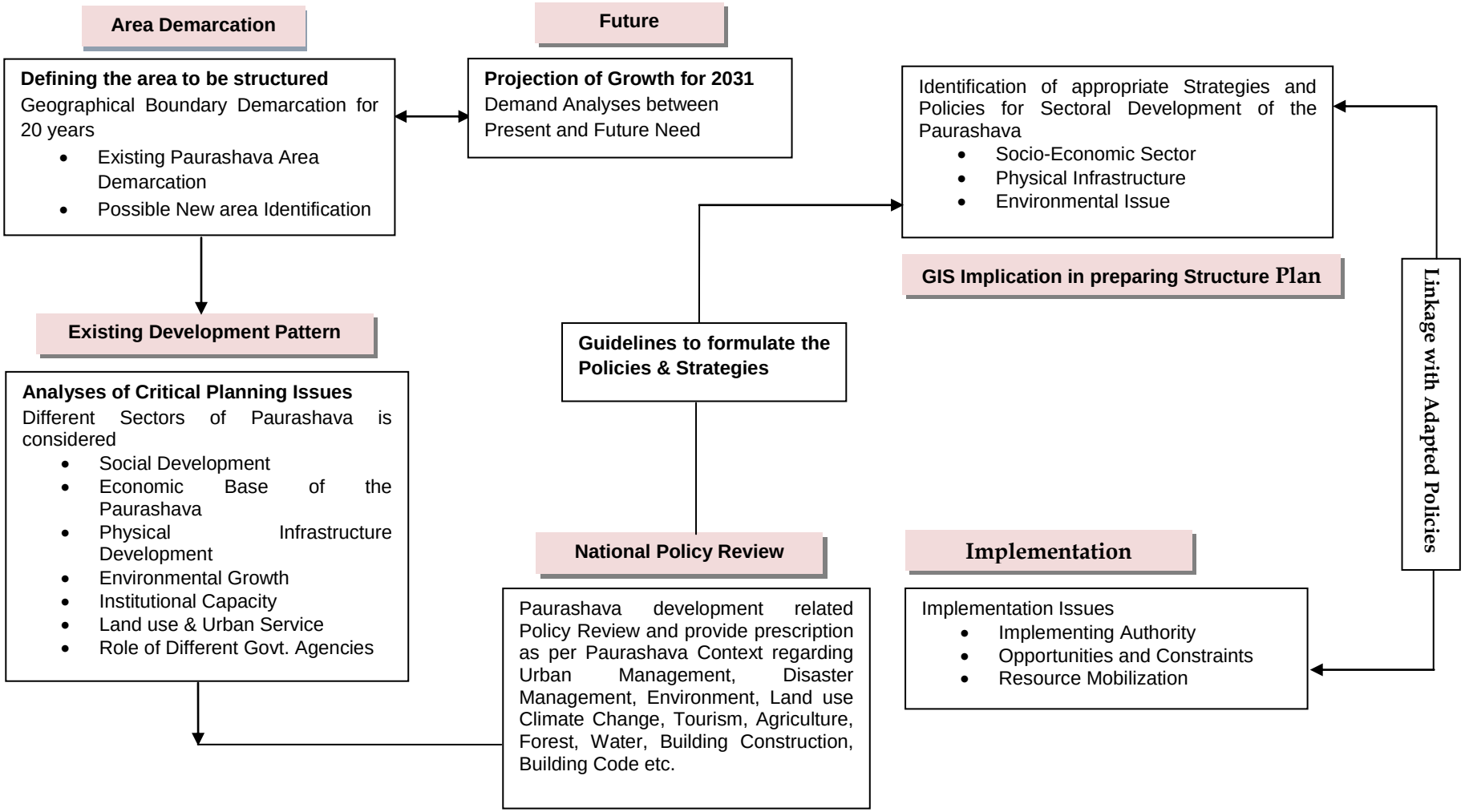


Fig 2.1: Content of Structure Plan

CHAPTER 3
EXISTING TREND AND GROWTH

3.1 Social Development

In Kalapara Paurashava, about 65.8% households concentrated in potential core area and 29% households concentrated in fringe area. This indicates that Kalapara is a semi-urban area, commercial development concentrated on core area, influential or affluent people live in the potential core area and the urban poor those are always likely to live in fringe area.

The educational status of an area is the major determinant of society building. As per BBS 2011, in Kalapara Paurashava the literacy rate is about 52% where the national level the literacy rate is about 51.8%. It is seen that almost all the wards have similarity in occupation and small business is dominant in every ward which is followed by services and agriculture.

About 93% of the households at Kalapara Paurashava have their own housing structures. Considering other assets it has been observed that according to BBS 2011, about 51.5% households own agricultural lands. At Kalapara Paurashava, about 40.93% of the households' incomes are within the range of Tk 5001.00 – Tk.10, 000.00 per month. Further, 24% of the household have income per month Tk. 2500.00 – Tk. 5000.00; 18% Tk. 10,001.00 - Tk. 15,000.00; 8% Tk. 15,001.00 – Tk. 20,000.00 and 7 % Tk. 20,000.00 above. It can be seen that there are different types of income groups of people living at Kalapara Paurashava area.
About 82 % of the populations are Muslims, and the rest 17.7% of the people are practicing Hinduism and rest 0.6% of the people are Buddhism at Kalapara Paurashava.

Survey report depicts at Kalapara Paurashava about 8.18% of the total households come from other places. Majority of the migratory (51.4%) of the households have come after 2000 to Kalapara Paurashava area which means the migration phenomenon is of recent and the rest 31.4 % have come during 1990 -2000 and 17.2% have come during 1980-1990. The most common reason of the in-migration of the households to Kalapara Paurashava is the workplace. Moreover, better education facilities and business have also significant contribution behind migration. All these issues have been given emphasis for attaining social development of the area.

3.2 Economic Development

In Bangladesh, the economy is composed of formal and informal sectors. But statistics on the size of the informal economy in Bangladesh are difficult to find out. Formal economic activities sector of Kalapara Paurashava mainly comprises Trade and Commerce, Agriculture, Service Sector, Industry, Transport and so on. The major occupational group is involved in small business, services and agricultural activity (Socio-economic Survey, 2010). About 67.7% of all the households' members irrespective of sexes of Kalapara Paurashava are within the age group of 16-57 years. This indicates majority of the household members are economically active group. People of this area are mainly involved in agriculture and business activities. Kalapara upazila has great agricultural potentiality. At present from Kalapara Paurashava; various products are supplied to different district by water way and road. Also, various types of fishes especially shrimp are also available here. So, agro-based and fishing based industries can be developed for fostering economic development of the area.

3.3 Physical Infrastructure Development

As Barisal region is mainly dependent on agriculture, the Paurashava activities are still oriented with agriculture sector and the physical infrastructure development is hindered due to natural calamities. Some segmented and sporadic physical developments have been occurred over the years in different parts of the Kalapara Paurashava. Most of the infrastructures have developed without maintaining any regulations or standards.
Physical feature survey depict that there are total 4381 structures at Kalapara Paurashava. About 65.74% of the structures are kutcha which is followed by 26.71% semi-pucca. Pucca structure is very low percentage (7.55%).

At present, the road network of Kalapara Paurashava area shows lack of planning principles. From the physical feature survey it has been observed that about 54.74 % of the roads are pucca which is followed by 13.18 % kutcha roads. So, it might be possible to develop the planning area considering the ward wise development to some extent.

At Kalapara Paurashava, about 9.44 kilometers pucca drainage network have observed. Maximum pucca drains have observed at ward no 4 and 7. Most of these drains are connected with the river and khals.

3.4 Environmental Growth

Kalapara Paurashava is located in the southern part of Bangladesh. It is very close to the Bay of Bengal. Morphological condition of this Paurashava is quite similar compared to the other district located in south-west region of the Bay of Bengal. The climate has hot summer and a mild winter. Temperature rises steadily from January to April, remains fairly steady from April to October and then falls to reach the lowest in January. The maximum average monthly temperature is 29.7^{o}c in August and minimum average monthly temperature is 20.3 ^{o}c in January in 2010. The monsoon starts from June and maximum rainfall is experienced in 2007 and lowest in 2010. Annual rainfall as recorded from 2000 to 2010, the maximum was 250.47 mm in 2004 and lowest in 2010 about 61.73 mm. Drinking water of the Paurashava is quite saline and also contaminated by iron. So, the establishment of Water Treatment Plant will be required for ensuring the good drinking water. In addition, it is possible to preserve the environment before any advanced development as industrial development is very low.

3.5 Population

Kalapara Paurashava comprises around 17332 numbers of people (male 8887and female 8445). Highest number of population has observed at ward no 9. The average population density of Kalapara Planning area is 4537.17 person /sq.km (18 persons per acre). This indicates that Kalapara is a high density area with respect to both national and district density. Average size of households of Kalapara Paurashava is 4. This indicates the culture of having small nuclear families which shows urban life characteristics.

Table 3.1: Population Distribution of Kalapara Paurashava Area

Ward	Population at 2011	Area (acre)	Density (person per acre)
Ward 1	3319	297.66	11
Ward 2	1501	57.27	26
Ward 3	1681	73.05	23
Ward 4	1331	38.80	34
Ward 5	1193	57.56	21
Ward 6	1662	36.65	45
Ward 7	1347	59.04	23
Ward 8	1824	94.65	19
Ward 9	3474	229.87	15
Total	**17332**	**944.56**	**18**

Source: BBS 2011, Community Series, Zila: Patuakhali

3.6 Institutional Capacity

In Kalapara Paurashava, the plan implementation and main power executing authority will be the Paurashava itself. Therefore, effective execution capacity in terms of revenue generation, manpower capacity of the Paurashava is required to evaluate to implement the plan. There are four major component of income generation. These are: 1) Revenue, 2) Development, 3) Capital and 4) Project.

Most of the income of Kalapara Paurashava in the recent years has been generated from development section. It has been analyzed that in last 5 years the development sector has contributed about 55.76% on an average to the overall income of Paurashava. Besides, revenue sector contributes about 38.64% on an average to the overall income of Paurashava.

Moreover, in last 5 years the development sector has consumed about 52.60% on an average of overall income of Paurashava. Analyses reveal that in the last three years the expenditure was greater than income but in 2010-11, the expenditure was almost equal to income.

Existing Manpower of Kalapara Paurashava is comprised with 1 elected Mayor, 9 ward councilors and 3 Departments. These are:

1. Engineering Department
2. Administrative Department
3. Health, Family Planning & Conservancy Department

On the basis of organogram, these three departments should comprise of 35, 35 and 19 persons respectively but at present there are 3, 8 and 2 persons respectively. The manpower of Kalapara Paurashava is not so much capable to implement the Paurashava Master Plan. The Existing posts are not fulfilled by the required manpower. Besides, it may require more efficient, technical and experienced manpower to implement the master plan. It has been observed that in Engineering Department about 91% posts are vacant, in Administration Department about 77% posts are vacant and in Health, Family Planning and Conservancy Department the percentage of vacant posts are about 89%.

Moreover at present, there is no town planning unit at Kalapara Paurashava. Engineering Department is responsible for monitoring the development control issues of this Paurashava.

3.7 Urban Growth Area

The Paurashava is expanding towards west to north direction. There is a major road network which is connecting West, North and East part of Paurashava that also links the Paurashava with other areas of Kalapara Upazila. Commercial development is already expanding along with the Ferry Ghat Road and Wapda Road. Moreover, a major portion of Western part is remained agricultural land. Commercial activities are developed along the both side of major roads. Administrative structures are mostly developed at ward no 1, 2 and 7 of the Paurashava.

Industrial development is mainly concentrated in ward no. 1, 8 and 9. So, it is expected and required to concentrate the development in the existing rather than expanding towards other areas. The industrial development should not be mixed up with residential development. On the other hand, existing industrial area is mixed with the residential and commercial area of the Paurashava. So, it is important to consider these features.

Residential structures are scattered all over wards, but mostly developed in core and potential core area. Specially for getting advantage of high lands, residential areas developed on the areas which is bounded by a big canal that are accelerating growth of the Paurashava on the south and east side.

In the planning area, predominant percentage of lands is devoted for agricultural purpose. From the landuse map, it depicts that agricultural lands are mostly developed in periphery area. However, major concentration is observed in ward no 1, 5 and 9. As the main economy of Kalapara Paurashava depends on business and agricultural sector, road and waterway network has significant importance for the economic development of the country.

Most of the roads of all wards are pucca and the overall condition is moderate except access roads. All these areas have been well linked up with functional road network but some roads are narrow especially access roads which are required to be more widened. **Map 3.1** shows the future growth direction of Kalapara Paurashava.

3.8 Catchments Area

Catchments area of the Kalapara Paurashava is calculated according to the agriculture commodities and movement of dwellers for rendering services. From Kalapara Paurashava,

agriculture commodities marketed to the Patuakhali and Barguna Zila and other adjacent areas. At present from Kalapara Paurashava; Paddy, rice, pulse, chilli, hide, potteries, cereals, fish, etc, products are supplied to different district by water way through Launch or trawler. Also, various types of fishes especially shrimp are also available here which are caught from Andharmanik River which is adjacent to Kalapara Paurashava.

Moreover, most of the trading activities are concentrated in the bazaar area of the Paurashava. People from different locations come here for daily bazaar. Here is an urgent need for preparing well defined master plans for all those Paurashavas to accommodate all physical developments enhancing socio-economic developmental activities so as to boost up living condition of the people living in the urban area.

3.9 Land Use and Urban Services

Land use is one of major determinants of planning especially in a developing country where technical component is being upgraded still. Suitable land use planning not only controls the development but also it can affect the traffic generation and degeneration of a particular area. At Kalapara Paurashava, there is dominance of residential land (about 42.20% of the total) followed by waterbody (about 21.58%).

About 398.58 acres areas are used for residential purposes. Ward no 9 has highest amount of residential land. About 22.08 acre lands are in commercial use at Kalapara Paurashava and ward no 2 and 6 are the commercial zone of the planning area. From the land use survey it has been observed that about 16.72 acres areas are used for industrial/ processing and manufacturing purposes and ward no. 1, 8 and 9 are the main industrial zone. About 17.22 acre land at Kalapara Paurashava is devoted for government services and most of the government services are located at ward no. 1 and 7. About 0.39 acre lands are devoted for recreational facility and highest concentration of recreational facility is at ward no. 8. Moreover, about 10.26 acre lands are devoted for community service and 0.48 acre lands are used for mixed use. At Kalapara Paurashava, about 58 structures are devoted for community service and 69 structures are devoted for service activity. Most of these structures are scattered all over the wards.

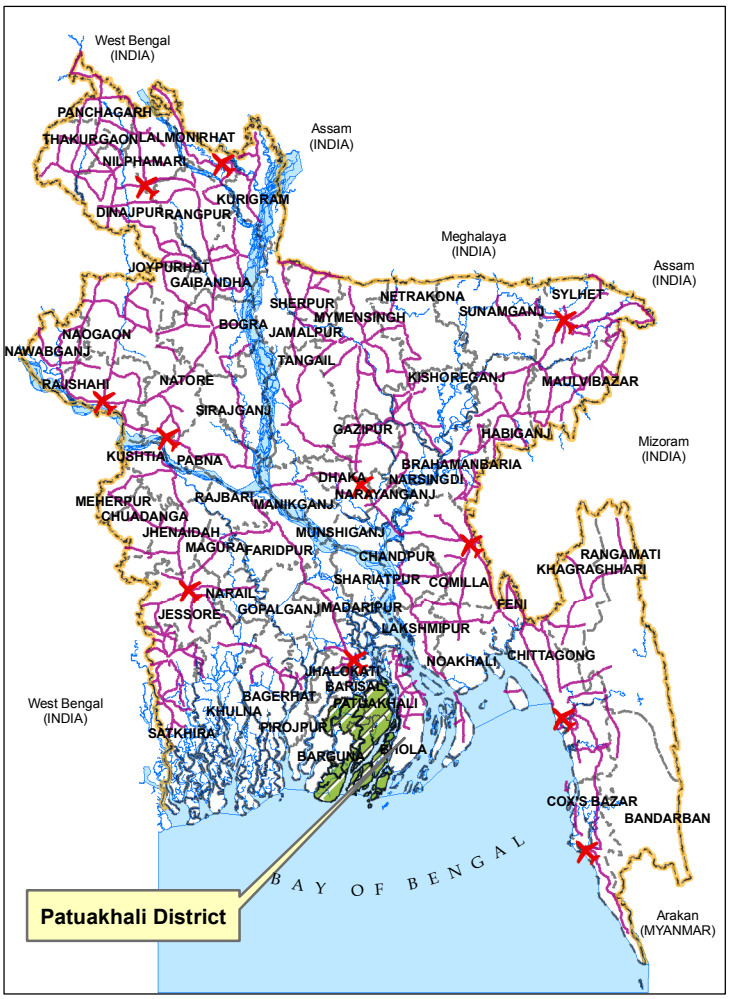
The landuse pattern clearly indicates that land use pattern reveals urbanized oriented land uses rather a semi-urbanized land use structures. Moreover, existing land proportions of different land uses is not in consistent with the principle of land allocation/distribution of an ideal town.

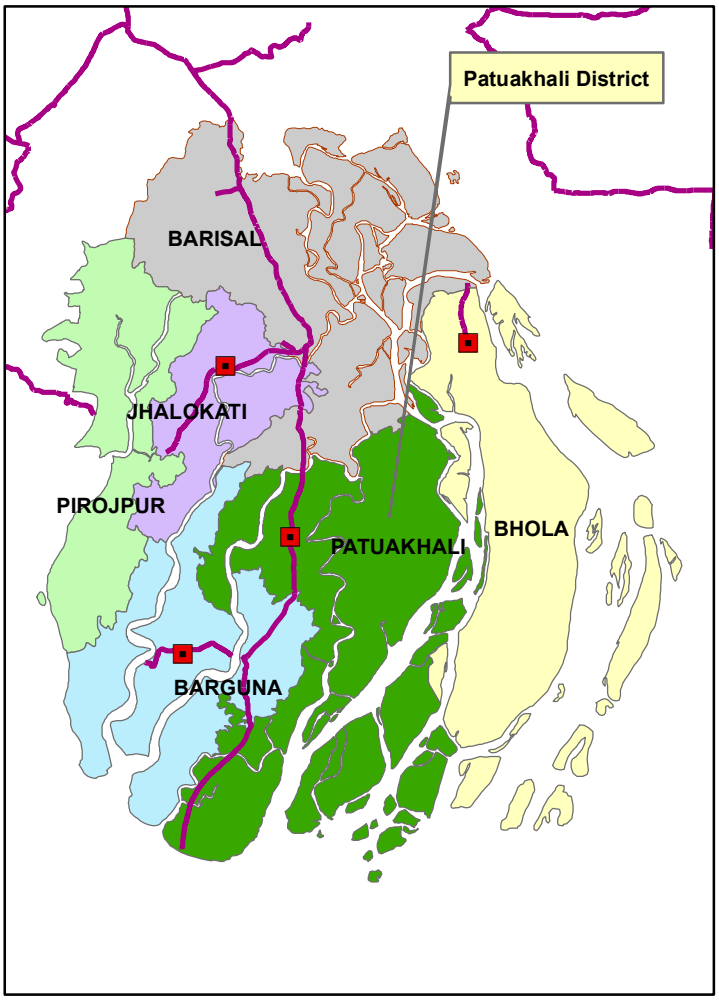
3.10 Paurashava Functional Linkage with Regional and National Network

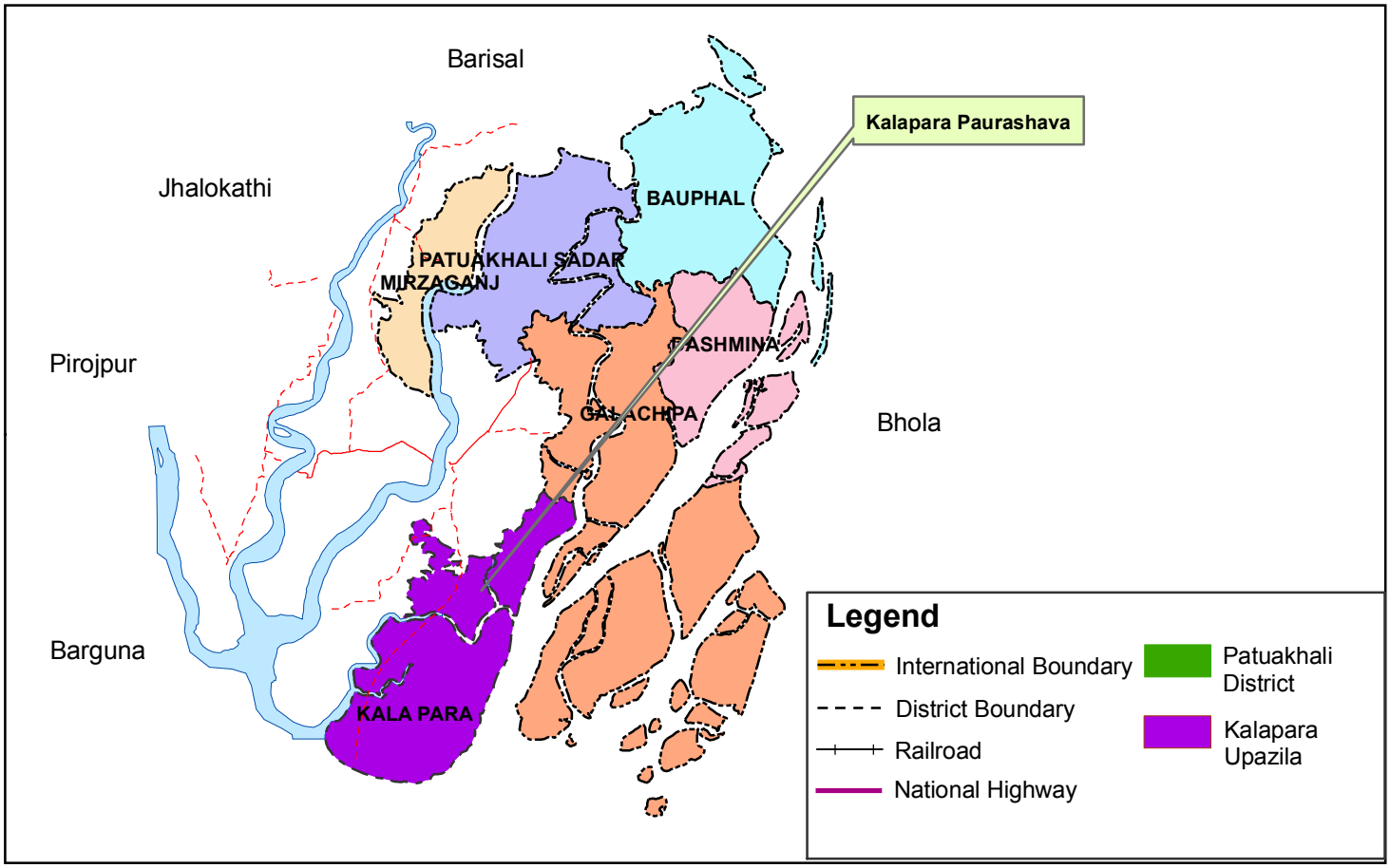
Kalapara Paurashava is located at Patuakhali District. The district is bounded on the north by Barisal, on the east by Bhola district, on the south by the Bay of Bengal, on the west by Barguna district. Noted river is Ramnabad.

Patuakhali is a district in the south of Bangladesh and a part of the Barisal Division. Communication system of Patuakhali is not much satisfactory. A regional highway is gone through Patuakhali district. A highway Barguna -Patuakhali –Barisal is gone through Patuakhali which is connected with Kalapara by a connecting road. This highway is also used to reach Barguna, Barisal and Dhaka. The Highway is running through North-South direction upto Kuakata Tourism Site. Moreover, among eight upazilas of Patuakhali district, almost all are connected by water ways. The upazilas are Bauphal, Dasmina, Galachipa, Kalapara, Mirzaganj, Patuakhali Sadar, Dumki and Rangabali. So in case of Patuakhali district water ways improvement should be given high priority. Regional Linkage map of Kalapara Paurashava has presented on **Map 3.1.**

Map 3.1: Regional Linkage Map of Kalapara Paurashava







3.11 Role of Agencies for Different Sectoral Activities

Kalapara is a B Class Paurashava. The collaboration among different agencies is essential to execute the plan and make a linkage with national plan and investment. Therefore, the role of different agencies or organizations is required to identify and understand.

LGED

The major functions of LGED can be broadly categorized as follows:

- Rural infrastructure development
- Urban infrastructure development
- Small scale water resources development

Urban Infrastructure Development consists of Planning and implementation of integrated town centre (bus terminals, markets etc.), municipal roads, bridge/culverts, drainage, water supply and sanitation projects, solid waste management projects, slum upgrading projects, development of Land use plan, improve planning & management capacity and resources mobilization & management, Institutional development of municipalities through training and computerizations, preparation of district and upazila town master plan, Development of technical specifications and manuals for construction of urban infrastructures.

RHD

RHD is responsible for the construction and the maintenance of the major road and bridge network of Bangladesh. It has a sustainable capacity to plan, manage and deliver its full range of responsibilities in respect of the main road and bridge network and to be accountable for these duties.

PWD

Public Works Department (PWD) plays a pivotal role in the implementation of government construction projects. It also undertakes projects for autonomous bodies as deposit works. The specific functions are:

- Construction of Buildings for Other Agencies on a Deposit Work Basis
- Maintenance of Public Parks
- Design and Construction of Public Buildings except those of RHD, T&T, Postal Department
- Construction of National Monuments
- Repair and Maintenance of Public Buildings
- Preparation of Book of Specifications and Code of Practice
- Acquisition and Requisition of Land for construction Work
- Procurement of Materials & Equipment Required for Construction Work
- Valuation of Land and Property and Fixing of Standard Rent

BWDB

Bangladesh Water Development Board (BWDB) is the principal agency of the government for managing water resources of the country. It was given the responsibility of accomplishing the tasks of executing flood control, drainage and irrigation projects to increase productivity in agriculture and fisheries.

DPHE

The Department of Public Health Engineering (DPHE) with its development partners is trying to ameliorate the sufferings caused by the lack of safe water. Alternative options for safe water supply are being catered in worse affected areas. Similarly for excreta and other waste management DPHE is implementing different projects to achieve an improved environment.
Besides, ensuring water supply and sanitation services/ facilities during and after the natural disasters/ calamities is another major function of DPHE.

PDB

Major roles of Bangladesh Power Development Board (BPDB) are

- To deliver quality electricity at reasonable and affordable prices with professional service excellence.
- To make electricity available to all citizens on demand by the year 2020.
- To provide specialized skilled services in Operation and Maintenance with outstanding performance in Generation, Transmission and
- Distribution for promoting competition among various power sector entities
- To reach self sufficiency by increasing of its income and reduction of expenditure

BIWTA

An advisory committee has subsequently been constituted to advise the authority in respect of all matters related to development, maintenance and operation of inland water transport and of inland waterways in Bangladesh.

- Draw up programmers of dredging requirements and priorities for efficient maintenance of existing navigable waterways and for resuscitation of dead or dying rivers, channels, or canals, including development of new channels and canals for navigation
- Develop, maintain and operate inland river ports, landing/ferry ghats and terminal facilities in such ports or ghats
- Carry out removal of wrecks and obstruction in inland navigable waterways.
- Ensure co-ordination of Inland Water Transport with other forms of transport, with major sea ports, and with trade and agricultural interests for the optimum utilization of the available transport capacity

Regulatory functions

a) Fixation of maximum and minimum fares and freight rates for Inland Water Transport on behalf of the Government

b) Approve time tables for passenger launch services

c) Act as the Competent Authority of Bangladesh for the protocol on Inland Water Transit and Trade, looking after the use of waterways of Bangladesh on behalf of the Govt. of Bangladesh for the purpose of trade and transit between Bangladesh and India as provided in the Protocol

Land Registration Department

Land Registration Committee responsible for land registration. This Registration department records land mutations arising through sale, inheritance or other forms of transfer, reports changes to the Ministry of Land and collects the Immovable Property Transfer Tax.

CHAPTER 4
CRITICAL PLANNING ISSUES

4.1 Physical Infrastructure

The physical developments of Kalapara Paurashava have encroached water bodies such as khals, ponds, ditches and the existing fertile land. This is very much detrimental for conserving biodiversity. Further, the existing physical developments are taking agricultural lands as much as possible which will create danger on the food security and also on the economic base of the planning area.

The Paurashava is a naturally developed area. Planning effort yet not been taken by the public authority. Therefore, there are some segmented and sporadic physical developments that have been occurred over the years in different parts of the Kalapara Paurashava.

The internal roads are developed in an unplanned way and also most of the access roads are katcha and narrow. These roads are not capable to accommodate the future growth of this area. Moreover, there is no traffic management system and footpath facility which cause lack of planning in transport network development. This situation hinder the economic development but also the potentiality of physical development of Paurashava

The overall condition of utility / municipal services is unsatisfactory. Water supply network and electricity facility is not adequate for residents of this area. Moreover, there is no solid waste disposal facilities, sewerage facilities and gas supply facility. Low land elevation and the distribution of water bodies make it difficult to provide the utility services, road network development over the Paurashava and also hinder well investment to encourage any industrial development.

4.2 Socio-Economic

The overall condition of different available urban utilities/civic services at Kalapara Paurashava area is not satisfactory. No gas supply facility is available for the households of Kalapara Paurashava. At present there is no dustbin and waste disposal facility at Kalapara Paurashava. It appears that wastes are thrown here and there which pollute the area and create environmental problems. The people of this area also suffer for disaster problems such as flood, water logging, cyclone, etc. people also face some pollution problems like water pollution, noise pollution, beach pollution, etc. There is also lack of recreational facility at the Kalapara Paurashava. The households of Kalapara Paurashava face some communication problems in their daily life such as narrow road problem, flood erosion problem, road jam problem and lacking of town bus service. However, this aspect needs vital consideration.

Most of the economic activities in Kalapara area are rudimentary in nature. Poor technology, unskilled labor force, low investment makes such economic activities uncompetitive with other cities and towns. Public investment in Kalapara area is not enough to generate growth impulses. Public investment in appropriate areas is a must for revitalizing its economy. Local people, particularly those who are rich, are apathetic towards investment. The main reason can be explained in two points: first, the investment is not safe and the second the investments must be in big cities where there these are safe. Lack of availability of funding sources/agencies viz. bank, etc is also acting as hindrance for economic development.

4.3 Environment

As the area is in coastal region, saline and iron have been contaminated the water. Agricultural production, fisheries and livestock are affected by higher salinity in the dry season.

At present, there is no solid waste management system at Kalapara Paurashava. Most of the people threw garbage here and there, which causes serious environmental pollution and also some times clogged the existing drainage network.

In preparing the master plan for Kalapara Paurashava, the above issues have dully been considered and proper steps have been taken to mitigate those effects.

4.4 Transport and Communication

Kalapara Paurashava is connected with Barguna, Patuakhali and Kuakata, with diverse regional roads. The inter-district movement is mostly done through motorized vehicles. Moreover, water transport network of Kalapara Paurashava has significant importance for the movement of both people and commodity.

There is no public or private bus service available for intra-zonal movement among Kalapara Paurashava. Intra-zonal movement among the Paurashava area is mostly done through the non-motorized vehicles such as rickshaw, bi-cycle, van, etc. People also use some motorized vehicles such as motorcycle, tomtom, etc. Rickshaw is the most dominant transport for intra zonal movement. Peak Hour traffic has been observed from 8.00 to 13.00 and 16.00 to 21.00 because most of the educational and commercial movement has been accomplished within the time periods.

There is one stand for bus, two stands for rickshaw and one stand for van and one launch ghat at Kalapara Paurashava. Surface Condition is poor. At present, there is no designated space for truck terminal within paurashava.

The area is not served by well defined road hierarchy and most of the roads are narrow. At present, the roads of Kalapara Paurashava have free flow and transport density is low. But it is important to design a planned network with designated width to accommodate the future pressure of traffic.

4.5 Landuse Control

At the present time, there is no control over land development at Kalapara Paurashava. The master plan is intended to prove a broad guideline to control the future development and to organize all types of development in a planned manner.

Major aim of the Landuse Policy 2001 was to prevent indiscriminate conversion of agricultural land into non-agricultural use, because such conversion may be threatened for food security of the country. But for providing necessary services to the Paurashava agricultural land need to use which should be as small amount as possible. 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.
- Water body should be preserved to maintain the natural drainage system of the area.
- Easy accessibility with the surrounding upazila and regional linkage has to be ensured.
- Rural characteristics of the rural settlement have to be strictly maintained.
- All the municipal services have to be designed covering all the residents of the planning area.
- Land encroachment should be strictly outlawed.
- Agricultural lands can be used for other purposes considering the importance of the use and considering the quality of land in terms of its production.

4.6 Disaster

Kalapara Paurashava is located on the coastal belt, as a result the people of this area face Devastating cyclones hit the area usually accompanied by high-speed winds, sometimes reaching 220 km/hr or more and 5-6m high waves, causing extensive damage to life, property and livestock. It has observed that Cyclone hit Kalapara Paurashava in different years. But, in 1937, 1958, 1970, 1985, 1991, 2007 and 2009 year the extreme cyclone track is passed over the Kalapara. The cyclone SIDR and Aila were a big hazard for their natural climatic condition.

A flood is the most common natural disaster at Kalapara Paurashava. Direction of flow of water during flood at Kalapara Paurashava is naturally river to town and the area is inundated during May to November.

4.7 Laws and Regulations

The laws and regulations prescribed (mentioned in Chapter 5 section 5.2) are not directly related with the physical development activities and their control. The East Bengal Building Construction Act, 1952 is called the mother regulation to control all type of physical development but no instruction is being included in the Paurashava Ordinance, 1977 regarding EBBC Act, 1952. The Paurashava authority approves the building plan and excavation of plan 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 the 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. However, eligible development authority will be required to exercise proper rules and regulations for controlling the development considering various related issues.

CHAPTER 5
PAURASHAVA DEVELOPMENT RELATED POLICIES, LAWS AND REGULATIONS

5.1 General

Planning law must clearly define the extent and content of the rights of the Government and the people. Thus, legislative measures can help to frame policies for best use of land and its policies to control. Law should aim at a clear definition of the responsibilities and functions of various Government departments and its respective powers. For urban development, law has profound implications. It defines the system of urban Government, establishes the system of urban planning and regulation of urban development.

5.1.1 Local Government (Paurashava) Act, 2009

According to the Section 95, Paurashava, and if so required by the prescribed authority, shall draw up a Master Plan for the Municipality which shall, among other matters, provide for:

- A survey for the municipality including its history, statistics, public services and other prescribed particulars
- Development, expansion and improvement of any area within the municipality and
- Restrictions, regulations and prohibitions to be imposed with regard to the development of sites, and the erection and re-erection of buildings within the municipality

5.1.2 Urban Management Policy, 1999

The adopted policies under the policy statement are:

- Paurashavas shall provide and maintain the following services to their constituents: (i) Water supply, (ii) storm water drainage (iii) solid waste disposal, (iv) public sanitation, (v) roads and traffic control systems, (vi) public markets, (vii) public transport terminals, (viii) recreational parks and reserves, (ix) community centres, (x) street lighting, etc**.**
- Municipalities shall develop Public Investment Programs (PIP) which will reflect the priority infrastructure needs and appropriate fiscal practices needed to accomplish these.
- The capital budgeting process by municipalities and project selection shall be made transparent.
- Land use plans shall be prepared by Paurashavas in consultations with local communities and shall be periodically updated. Such plan shall form the basis for all property and land development and the assessment of taxes. Each Paurashava and Surrounding Area shall endeavor to appoint a full time qualified Urban Planner to its staff for this purpose, and until such appointment is executed; such services shall be contracted out.
- All external financing extended either directly to Paurashavas by multilateral or bilateral sources or on-lent via the MDF for municipal investments shall be provided on comparable terms.
- Paurashava and Surrounding Area will adopt as early as possible a double entry accounting system on a cash basis. Training and technical assistance shall be provided on a priority basis to facilitate computerization in the transition to double entry accounting.
- Paurashavas shall generate sufficient revenues from their own sources to meet, at a minimum, all of their operating expenses.

- The Government shall review in consultation with municipalities the current intergovernmental revenue transfer system and make appropriate changes to make it transparent, rational, and predictable and to some extent performance based.
- Paurashavas shall endeavor to contract out service provision in whole or in part to private providers in areas such as solid waste disposal, public sanitation, and road maintenance.
- Paurashavas shall conduct periodic public meetings to advise their constituents regarding their activities as well as to engage the public in consultations regarding investment choices, decisions and priorities. As part of this increased transparency.
- Maximizing the participation of women shall be accorded high priority.

5.1.3 National Housing Policy, 2008

The salient features of the housing strategy envisaged in the National Housing Policy are:

- The role of the government in housing will be to supply serviced land at reasonable price and to help create and promote housing financing institution
- Efforts will be made to increases affordability of the disadvantaged and the low income groups through providing credit for income generation
- Improvement and rehabilitation of the existing housing stock will be given priority by the government alongside new housing
- Encroachment on public land and unauthorized constructions will be discouraged
- Facilities incremental house building and ensure wider application resources
- Conservation of the natural environment and preservation of cultural heritage in new housing projects

In this policy, there are some specifications are illustrated for Urban and Rural Housing. As the urban and rural context in Bangladesh is different, so the strategies and policies of these sectors are also different. Though the context is different but rural area and urban area are economically, socially and environmentally dependent on each other.

Rural Housing

Clause 5.9 of the Housing Policy describes about the rural housing. 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, programs similar to 'Adarsha Gram' program 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 up gradation of rural housing with the activities under the Bangladesh Rural Development Board (BRDB) and other programs for the creation of rural assets and employment.

5.1.4 Population Policy, 2004

The following strategies will be adopted to slow down the growth of urban population:

- Satellite towns and growth centers should be established with adequate facilities to provide alternative destinations to rural migrants. Roads and communication systems should be linked with the growth centers; along with health, education housing and other welfare services created in those places. Headquarters of important Government and non- Government Organizations, educational institutions and industrial units may also be shifted or relocated to other cities
- Relax rules relating to going abroad of skilled workers and make provision for dual citizenship
- Impart education and skill training to the young men and women to become competent and skillful to handle many new and emerging fields in the cities and towns
- Create skilled manpower for overseas employment

5.1.5 National Land Use Policy, 2001

Main Components of the Policy

- use as much as required for agriculture purposes and land use cannot be changed with permission of the appropriate authority
- ensure use of land owned by the land lord absentee
- keep limit the process of division of agricultural land into small pieces
- identification of zones for land uses by Paurashavas and other places of Upazilas
- provision of assistance by the Revenue Office of District Administration in preparing zoning maps by the local government organizations
- existence of zoning law in the country; Abide this law to implement the zoning map prepared by the local government organizations
- encouragement to construct multi-storied buildings instead of single storied in the rural and urban areas so as to ensure optimum use land for residential purposes
- identification of the forest land by the Ministry of Forest and Environment
- undertake measures for protection, maintenance and expansion of the existing forest land
- encouragement for development of the social forestry
- keep open the exiting water bodies and those are not to be filled in. Entrust the responsibility of maintaining small ponds by the owners and large water bodies such as river, channels, haor, baor and beel by the community people and the Government. To this effect, these water bodies are to be re-excavated regularly
- use of embankments for controlling flood as roads as far as possible
- planned tree plantation on the embankments
- use ditches and other water bodies for fish production and rearing ducks created during cutting of earth for constructing embankments. Not to dig new land as much as possible during constructing embankments rather re-excavate the existing filled in water bodies
- ensure not to create water-logging by constructing embankments

- no acquisition of land for the purpose of road construction other than/except national highways, regional and district to Upazila roads, Upazila to Upazila connecting roads. Avoid human settlements and fertile agricultural land to acquire land wherever land acquisition is of utmost need. Construct inter and intra village roads in planned manner
- construct/establish industries in the designated places keeping view on the availability of support services for industrialization
- not to pollute/infect land or environment through discharging waste from the industries and follow strictly to treat industrial waste
- construct service roads along the main roads of the country so as to ensure safe movement of traffic as well as set aside 10 feet to 20 feet of land for plantation trees on the both sides of roads
- discourage construction of small and cottage industries within 10 kilometers of radius if industries are accommodated within the BSCIC industrial area
- protection of social rights of possessing land by the indigenous people living in the different parts of the country following their traditional laws

5.1.6 National Agriculture Policy, 1999

The following steps will be taken to ensure planned utilization of land for crop production:

- Land zoning program will be taken up by the Soil Resources Development Institute (SRDI) on a priority basis. Integrated approach of SRDI will be further strengthened for this purpose
- To ensure maximum utilization of land, bottom up planning through people's participation and its implementation will be started from the mouza or village level
- In most areas the same land is suitable for more than one crop. Therefore, farmers will be encouraged to grow more profitable crops as an alternative to only rice-rice cropping pattern
- Fertile agricultural land is going out of cultivation due to its use for non-agricultural purposes such as private construction, house building, brickfield, etc. Appropriate measures will be taken to stop this trend in the light of the Land Policy of the government
- Maximum utilization of land will be ensured through promotion of inter-cropping with the main crops
- Acquisition of land in excess of requirement for non-agricultural purposes will be discouraged
- Programs will be taken up to motivate the landowners not to keep their land unused without any acceptable reason

5.1.7 Transportation Policy

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. 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.

5.1.8 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.

5.1.9 Coastal Zone Policy, 2005

The following are the broad components of the policy:

Economic growth

- Efforts shall be made to enhance annual growth rate to a level required to achieve national goal for poverty reduction and economic growth;
- Available opportunities of the coastal zone will be used through sustainable management to enhance standard of living of coastal communities by investing in different sectors;
- A strategy shall be formulated covering all routes to development taking multidimensional nature of poverty.
- Emphasis will be given on building efficient power, transportation and telecommunication links, particularly with islands;
- Special emphasis will be given to utilize gas-based power, manufacturing and processing industries;
- Settled isolated chars and islands will be brought under ‘special rural development programs’;
- Necessary measures will be taken to increase the flow of investments in the coastal zone including direct foreign investment (DFI), especially by setting up more export processing zones (EPZ);
- Steps will be taken for medium and small private investments for coastal development.

Basic needs and opportunities for livelihoods

To meet basic needs of the coastal people and enhance livelihood opportunities, the Government policy will be as follows:

- Alleviation of poverty through creation of job opportunities and finding options for diversified livelihoods would be the major principles of all economic activities. Economic opportunities based on local resources will be explored to enhance income of the people;
- The intensity of coverage of primary education, health care, sanitation and safe drinking water facilities will be increased;

- Food production will be continued at the self-sufficiency level and of higher production of diversified high-value export goods;
- Private sector and the non-governmental organizations (NGO) will be encouraged to implement activities for the poor people;
- Collateral-free credit under easy terms will be arranged as part of all livelihood enhancement programs and activities;
- No alteration or stoppage of an existing employment opportunity shall be made without creating opportunities for alternative employment;
- Special measures will be taken during the period of disaster;
- *Khas* land will be distributed among the landless and a more transparent process of land settlement will be ensured;
- An effective program for land reclamation will be developed;
- Provide facilitate for the coastal navigation;
- An integrated network of communication including roads and waterways will be developed;
- The law and order situation will be improved by setting up police outposts in remote and far flung areas;
- Free flow of information for the people will be ensured.

Reduction of vulnerabilities

In order to reduce the vulnerabilities of the coastal poor from disasters like cyclone, drainage congestion, land erosion, drought, etc, the Government policy is as follows:

- Reduction to vulnerability to natural disasters would be an integral aspect of the national strategies for poverty reduction;
- Integration will be made with 'Comprehensive Disaster Management Plan' on aspects concerning the coastal zone;
- Effective measures will be taken to enhance coping capacity of the poor during the period of disaster and to initiate insurance scheme for improving their social security;
- Effective measures will be taken for protection against erosion and for rehabilitation of the victims of erosion;
- Safety measures will be enhanced by combining cyclone shelters, multi-purpose embankments, road system and disaster warning system. It should include special measures for children, women, the disabled and the old;
- Earthquake management will be strengthened and capacity to cope with earthquakes will be enhanced;
- Adequate provision will be made for safety of livestock during disaster and post-disaster period;
- Programs shall be taken to encourage all for tree plantation in a planned manner in the coastal zone. Emphasis will be given to social forestry and other forms of plantations, plant care and maintenance;
- The asset base of the poor, with special focus on women, shall be improved through ownership or access so that their coping capacity improves.

Sustainable management of natural resources

The Government policy to ensure sustainable management of both biotic and abiotic coastal resources will be as follows:

- Every possible steps shall be taken to secure just share from all international rivers reaching the coastal zone and the Bay of Bengal;

- Suitable measures will be taken for sustainable use of renewable resources and, to that end, limit harvesting, extraction or utilization to the corresponding cycles of their regeneration;
- Sustainable use of coastal resources shall be ensured. Combination of resource use, e.g. agriculture, forestry and fishing including aquaculture is often the major economic activity. Efforts will be given to make this sustainable;
- Optimum utilization of resources will be ensured by taking advantage of the complementarities and trade-offs between competing uses;
- Rigid enforcement of conservation regulations will affect the livelihoods of many people and such conservation efforts will be linked, as far as possible, with alternative opportunities of employment;
- Initiation of plan and its implementation will be ensured by participation of people of all sectors.

Land

- Planning will be done under land use policy to control unplanned and indiscriminate use of land resources. Strategies for new chars will be developed. Zoning regulations would be formulated and enforced in due course;
- Through its responsible agencies, the Government will proper plan and implement schemes for reclamation of balanced land from the sea and rivers.

Water

- Adequate upland flow shall be ensured in water channels to preserve the coastal estuary ecosystem threatened by the intrusion of soil salinity from the sea;
- Small water reservoirs shall be built to capture tidal water in order to enhance minor irrigation in coastal areas. Appropriate water management system within the polder utilizing existing infrastructures will be established for freshwater storage and other water utilization;
- Rainwater harvesting and conservation shall be promoted;
- Ponds and tanks will be excavated for conservation of water and local technology for water treatment (such as, pond sand filtering - P.S.F.) will be used for the supply of safe water;
- Step will be taken to ensure sustainable use and management of ground water.

Capture fisheries

- Comprehensive policies, as dealt in the National Fish Policy, in relation to exploitation, conservation and management of marine fisheries resources will be followed
- Fishers' right will be established on open water bodies for sustainable fisheries management

Aquaculture

- Environmentally adopted and socially responsive shrimp farming will be encouraged. In this regard, internationally accepted quality control measures will be introduced;
- All opportunities and potentials of aquaculture will be utilized in the coastal zone. Crab culture, pearl culture, sea grass will be encouraged.

Agriculture

- Programs for intensification of agriculture and crop diversification for improving the economic conditions of both male and female farmers and increasing food security at local and regional level shall be supported;
- Special development programs will be taken-up with a view to increasing the production of crops suitable for the coastal area with attention to maintenance of soil health;

- Use of chemical fertilizers and pesticides will be reduced, while organic manure and integrated pest management will be encouraged;
- Salt-tolerant crop varieties will be developed and extended along with possible measures to resist salinity;
- The scope of irrigation facilities will be explored and / or extended and a comprehensive water management for agriculture will be implemented.

Livestock

- Grazing land for livestock will be arranged. Facilities for livestock development will be enhanced;
- Facilities for rearing of poultry of different species including the local ones will be enhanced

Energy

- Assessments shall be made on the prospect of tidal and wave power in coastal areas' as potential energy source;
- An assessment of all types of energy resources (e.g., oil, gas, coal, nuclear minerals, hydropower, biomass fuels, solar, wind and tidal waves) will be undertaken on a regular/continuous basis by the appropriate authorities. Special measures will be undertaken for exploration and appraisal of petroleum resources in the offshore areas without undermining the nature;
- Potentials of area-based renewable sources of energy will be assessed;
- Remote and isolated areas including offshore islands, which are not likely to be brought under the networks of commercial fuels in a foreseeable future, are to be considered as potential sites for implementing renewable energy technologies, in spite of their high capital cost. Solar photovoltaic will be used for cyclone shelters;
- Special projects will be identified, for example power plants in the offshore islands. Plans for the generation of electricity in isolated and remote areas like offshore islands will be prepared separately.

Equitable distribution

To ensure right of the neglected and disadvantaged groups, the Government policy is as follows:

- Actions will be designed to reach the poorest and the remote rural areas (including the cyclone prone coastal regions, chars and river erosion affected areas), which are vulnerable to adverse ecological processes and those with high concentrations of socially disadvantaged;
- In order to ensure equitable distribution of national economic benefits, priority will be given to exposed Upazilas and coastal islands;
- In order to ensure equity, the thrust should be on human development of the poor for raising their capability through education, health, nutrition, employment-oriented skill training and social interventions;
- Measures will be adopted that increase access to natural resources for the poor and the disadvantaged (on which they are dependent for their livelihood)

Empowerment of communities

Mainstreaming of the coastal people will be done by enhancing their safety and capacity. In this context, Government policy will be as follows:

- Equal participation of all stakeholders shall be ensured and establishing effective co-operation between the government agencies, local government institutions and non-governmental organizations;

- Co-management procedures shall be established that will bring decision-making power to the grass root levels;
- Specific vulnerabilities of the coastal communities shall be addressed: like farmers in the saline zone, marine fishers, salt producers, dry fish processors, people living on forestry resources, ship breaking workers, vulnerable ethnic communities and so forth;
- Vesting on local government institutions, at the union, upazila and district levels, the power and responsibilities for design, formulation and implementation of local level development programs and projects;
- An awareness campaign shall be mounted about the long-term benefits of ICZM, recent initiatives in the coastal zone, and coastal development strategy among the NGOs, private sector, civil society and coastal communities;
- Initiatives will be taken to keep up the cultural heritage of different communities living in the coastal zone.

Women's development and gender equity

In this respect, the Government policy will be as follows:

- A gender sensitive and participatory approach will be adopted that focuses at the reduction of gender inequalities and that takes into account differences in needs and interests between men and women;
- Efforts will be made to close the gender gap, giving priority to women's education, training and employment and special support for broadening their coping capacity;
- Special attention will be paid towards employment generation for women, the promotion of women entrepreneurs as well as the removal of restrictions on women's employment and economic opportunities;
- During distribution of newly accreted khas lands, special attention will be paid to the allocation of land titles to women;
- Special projects will be implemented exclusively addressed to livelihoods enhancement and empowerment of disadvantaged women;
- Necessary institutional measures including mass awareness and motivation on violence against women will be taken.

Conservation and enhancement of critical ecosystems

The Government policy will be as follows:

Conserving the ecosystems

- Meaningful conservation shall be enforced of critical ecosystems including ECAs, heritage sites and marine reserves;
- Special measures will be taken for conservation and development of the natural environment of the Sundarbans
- The programs for institutional strengthening and capacity building shall be supported along with further development of the regulatory framework for the protection of the environment;
- The role of the Coast Guard will be acknowledged with emphasis and its capacity will be enhanced so that it can be used on behalf of all relevant institutions as a common resource for enforcement of different regulations applicable to the coastal zone;
- For activities that have direct adverse consequences on bio-diversity, steps will be taken to stop those activities and specific mitigation measures will be taken to minimize those effects;
- To protect the environment, all commitments shall be honored as signatory to different international protocols and guidelines in planning and implementation;

- Efforts shall be made to harmonize in the provisions of different existing laws and enact new laws, where required, to protect and preserve the coastal environment and its resources;
- Special measures will be taken for bio-diversity conservation;
- Measures will be taken for hill management including prohibition of hill cutting.

Pollution Control

- Zoning regulations will be established for location of new industries in consideration of fresh and safe water availability and effluent discharge possibilities;
- All industrial units will be required to install built-in safeguards against pollution within a given timeframe and will help them in obtaining financial support from international bodies to carry out the adjustments. Units failing to comply with the pollution standards will be required to pay "green tax" for cleanup of the environment polluted by them;
- Sewage treatment plants will be set up for the major cities like Chittagong, Khulna and Barisal and gradually in other urban centers;
- Steps will be taken to handle the issue of discharge of bilge water from ships and oil-spill according to international conventions to which Bangladesh is a signatory;
- A review of the desirability of supporting ship breaking as an industry `will be done and, in the event of its continuation, environmental standards will be prescribed under which it has to conduct its activities.

Climate Change

- Existing institutional arrangements for monitoring of climate change in Bangladesh will continue. Steps will be taken to support upgrading of technology and institutional strengthening for enhancing their capacity for generation of better data and more accurate long-term prediction and risk related to climate change
- Implementation of adaptive measures identified in relation to climate change for coastal zone and resources shall be gradually undertaken
- Efforts shall be made to continuously maintain sea-dykes along the coastline as first line of defense against predicted sea-level rise
- An institutional framework for monitoring/detecting sea level rise shall be made and a contingency plans for coping with its impact

5.1.10 Industrial Policy, 2005

Bangladesh is a developing country, and the present government is striving relentlessly to attain rapid economic development in the country. Despite a lack of resources faced by the Government, development programs in the key sectors have continued. Therefore, the Government in the Ministry of Industries has taken the role of a facilitator. In order to establish economically prospective industries in industrial sub-sectors, there are plans to set up industrial parks and special economic zones so that huge amount of unused and abandoned land can be utilized. All this is aimed at fostering industrialization and economic development and generating employment opportunities in the country. To reduce poverty and generate employment opportunities, more efforts are needed to establish agro-based industries as well as to raise agricultural production. This will ensure the protection and fair price of agricultural products and employment of a huge number of unemployed people. In order to create further employment opportunities beyond the agricultural sector, initiatives should be taken to set up small, medium and large industries across the country. In order to attain this growth in this sector, special importance has been given in the Industrial Policy on agro-based and agro - processing industries and on steps to overcome possible adverse conditions in the export-oriented garment sector. Importance has also been given on considering the SMEs and cottage industries as one of the major driving forces, providing assistance to women entrepreneurs on a priority basis, setting up special economic zones in

different parts of the country, improving the quality of industrial products to world standard, marketing of goods at competitive prices, and enhancing productivity in the industrial sector.

5.1.11 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.

5.1.12 National Urban Policy

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.

5.1.13 Rural Development Policy

The projects and programs as mentioned in the Rural Development Policy of Bangladesh are:

(i) Food for Works Program, (ii) G.R Program (Gratuitous Relief Program), (iii) T.R Program (Test Relief Program), (iv)V.G.D Program (Vulnerable Group Development Program), (v)V.G.F Program (Vulnerable Group Feeding Program), (vi) Single-House Single-Farm Program, (vii) Back to home Program, (viii) Food for Education Program, (ix) Rural Occupational Project, (x) Poverty Reduction Project, (xi) Self-employment Program for Women, (xii) Women Empowerment Program, (xiii) Coordinated Women Development Program, (xiv) Peace Home Program, (xv)Shelter Support Program, (xvi) Educational Allowance Program, (xvii) Aged-allowance Program, (xviii) Micro-credit Program and (xix)Allowances for Widowed, Poor and Husband-renouncement Women Program, etc.

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.

5.1.14 Disaster Management and Climate Change Policy

The issues prescribed under Climate Change Policy are:

- Mitigation, adaptation and technology transfer is a must measure to fight climate change enhanced vulnerabilities of poor.
- The complementarily of current policy regime in relation to adapting to climate change should be analyzed in order to define which aspects of adaptation are already in place. This would not only advance national (also regional and local) development processes, but also would reduce vulnerability of people to climate change.
- A micro-level climate change risk reduction plan should be developed by the communities. The process should initiate local level action ensuring the participation of grassroots people, NGOs, civil societies, academic and research institutes etc.
- A community centered approach should be taken to develop policies which should address development as well. The policy action plan should also promote appropriate technologies such as resilient crop varieties, irrigation schemes, and renewable energy sources, so that they are available and affordable for low-income communities of Bangladesh.
- It's been believed by the economists that climate change is the greatest market failure of the history of mankind. Climate is natural, therefore a common property. For this reason, climate

change related economic does not follow the prevailing market mechanism. Therefore, it should be understood that, the rich countries which are polluting should start paying for adaptation for the LDC and also start paying for mitigation within their countries. Bangladesh should make its position clear in favor of this logic in all negations and raise its voice.

5.2 Laws and Regulations

5.2.1 Urban Development Control

The president of Pakistan in the year of 1960 was enacted the Municipal Administration Ordinance, 1960. In the year 1977 through the Paurashava Ordinance, 1977 some of the Municipalities were upgraded as Paurashava and in the year 2009 Paurashava Ordinance is renamed as Local Government (Pauashava) Act 2009. The Paurashava may provide the function as prescribed in the Ordinance but no provision is being outlined to control and manage those functions. The Paurashava may enforce those regulations according to their capacity. The Act proves that the Paurashava is independent and self regularity body, but due to absence of necessary man power technical support staff and the government initiative in financial matter, the Paurashava is dependent and control by central government.

5.2.2 Building Construction Rules, 1996

Land use planning Rules

These are statutory rules to control land use according to planning standard. It is based on land use policies including Local Plans, such as residential density, road standard, provision of infrastructure and services. The relevant Acts Local Government (Paurashava) Act, 2009, Building Construction Act, 1952 and BNBC, 1993) and Master Plans of the cities are the main legal instruments, which is in force with regard to exercise planning control and standards.

Control of public estates

Different government agencies have developed some housing, commercial and industrial estates in different urban areas and they have leased them out. Terms and conditions of lease deed reflected control provisions included in them.

Non-compliance of development control by some government and semi-government agencies

A portion of urban lands of the urban area are owned by different government and Autonomous agencies including universities, colleges. According to Building Construction Act, 1952 (amended in 1996, followed by Paurashava) each public building needs approval from the concerned development agencies. It is observed that most of the agencies are still ignoring the regulations and they construct their buildings within their premises.

Control of private housing estates

Large numbers of pockets of urban infill and privately owned low lying peripheral lands have been developed by private companies. In some cases small scale real estate development permission is obtained occasionally but deviations from the approved plan are most common practice of the developers.

Control of informal Development

A number of unregulated or informal settlements are taking place in urban area as urbanization proceeds. Paurashava can hardly control these haphazard development activities. The Slum Up-gradation Projects, Slum Improvement Projects (SIPs), provision of basic needs etc. are taken up at time when the problems had already overtaken the situation.

Density Control

Density Control is considered as an important development control tool. It includes the number of units, people allowed per parcel of plot size, unit limitation, height of the building etc. In the Government and Semi Government institutions, building permission is hardly obtained and

therefore, density control rules and regulations are not in practice. At present, Paurashava follows Building Construction Rule, 1952 (amended in 1996) which restricts the height of Building in respect of adjacent road. Therefore, density control is possible to exercise in practical.

Taxation

Urban taxation is another effective development control tool. Different types of taxation policies may to change urban land use and urban character. As an example, the industrial estates are encouraged to set up outside the city areas for tax holiday and other ancillary facilities. On the other hand, exemption of tax on urban vacant land encourages growing unauthorized settlements like slums and squatters.

Payment of Betterment fee

For every town planning scheme for an existing town, some owners of the property will be affected and as such they will have to be paid some amount as compensation. In the same time, some owners will be benefited by the proposed scheme. The share of increase in the value of the properties of such owners to be paid to the Paurashava is known as Betterment fees.

5.3 Strength and Weaknesses of the Existing Policies

Local Government (Paurashava) Act 2009

Although the Paurashava has been given the rights to prepare Master Plan and implement them, prepare development plans and projects for systematic development of Poura- city, building control, roads and streets plans etc. Besides, the replacement of Ordinance amended in 2008 by Local Government (Paurashava) Act 2009 ensures the citizen participation in a new way. But there are some drawbacks or weaknesses in this which are as follows:

- The engineering department has been given the responsibility to implement the Master Plan, but this department is not equipped enough to implement it properly
- To implement the Master Plan/ Land Use Plan, the staff requires professional training, but no one has received any training regarding implementation activities
- Central Government does not exert any pressure to implement the Land use Plan
- Paurashavas do not enjoy real autonomy to solve local problems
- More critical problem is the weak or even non-existent co-ordination amongst development partners

Urban Management Policy

The Policy statement recognized the decentralization could enhance efficiency of public expenditures by allowing local governments to be more responsive to local needs and preferences. The policy also envisions strengthening the beneficial aspects of urbanization and at the same time effectively dealing with its negative consequences so as to achieve sustainable urbanization, keeping in view the multi-dimensional nature of the urbanization process. On the other hand, the policy principles gave emphasis more on physical aspect of development rather than on social, environmental. Besides, issues on poverty reduction are missing in the policy outlines.

Land Use Policy, 2001

The National Land Use Policy, 2001 of the Ministry of Land highlights the Need, the importance and modalities of land zoning for integrated planning and management of land resources of the country. It also mentioned the need of formulating a Zoning Law and Village Improvement Act for materializing the identified land zoning area. The National Land Use Policy specially highlights the need for land zoning for the coastal area of Bangladesh. It describes about the need for definite guidelines and raises the possibility of doing coastal land zoning through an inter-ministerial task

force. The policy observes that maximum utilization of lands and water resources depends on the effective land use plan. But there is no policy prescription for any specific area as context requires and also the proper methodology, technology to be used, institutional capacity are not designated. Besides, the policy is strong on conservation of khas lands but not clear on distribution of khas land distribution program.

Industrial Policy, 2005

One of the foremost objectives of the Industrial Policy 2005 is to set up planned industries considering the real domestic demand, prospect of exporting goods abroad, and discouraging unplanned industries in the light of past experience. The policy also encourages the agro-based industries and involvement of Women Entrepreneurs in Industrial sector, equal profit distribution among workers, owners and government. But the interests of small farmers, small business owners, artisans, and workers, are generally not well represented. This limits the benefits of trade expansion for small businesses, small farmers, artisans, and workers consequently create impacts on the key export industries. These groups are involved in import and export activities of the country indirectly. In addition, no specific mention has been made on protection of coastal environment from industrial pollution.

Coastal Zone Policy, 2005

The strong point of Coastal zone policy is that it provides integration among all sectoral policies such as land use, industrial, fisheries etc. It defines specific objectives for coastal development and the jurisdiction and extent of the coastal zone. The main stakeholders in coastal development are identified, along with their role in the development process.

Agriculture Policy, 1999

The key point of the National Agriculture Policy in relation to ICZM is its simultaneous recognition of the importance of shrimp farming as foreign exchange earning activity and its environmental consequences. However, the policy does not mention conflicts between farmer and shrimp-gher owners and thus fails to indicate any mitigation measures. Land use zoning may offer instruments to reduce conflicts. Bio-saline agriculture, practiced elsewhere, could be tried in the coastal zone.

Population Policy, 2004

It defines the strategy of population declination but no detailing has been given on the instruments that are required to reduce the population growth. Also, the responsible stakeholders that are directly and indirectly linked to this sector are not identified. A general policy prescription is given without specific group identification.

National Housing Policy, 2008

The policy provides prescription for urban and rural area individually considering the context. Though one of the major objectives of the Housing Policy was to ensure housing for all with particular emphasis on the disadvantaged, destitute, the shelter less poor and the low and middle-income groups of people, yet very little efforts have been taken on the part of the government in providing housing loans to the low-income strata of the population. Nationalized commercial banks introduced housing loans also limited for the high income group. There is virtually no credit financial mechanism for housing of low-income people in urban areas. Besides, there is no specification for private developers. No direction is given for future housing demand and supply.

CHAPTER 6
PROJECTION OF FUTURE GROWTH BY 2031

6.1 Introduction

Population growth rates in developing countries are much more than of the developed countries of the world. Moreover, migration to urban areas in the developing countries has been increasing over the years. Due to increased urbanization trend in the coming years, the cities in the developing country will face housing and settlement problems, infrastructural deficiencies for increased number of populations, slum and squatter settlements, environmental degradation, etc. In practical, it is difficult to attain the actual number of population but more accuracy in population projection will encourage the future investment as projection shows the population demand. It is assumed that Kalapara Paurashava, as a Paurashava will face such influx of job seekers in the coming days. As such, besides natural population growth immigrants will increase the population significantly in the coming decades.

6.2 Projection of Population

In order to get an idea about the population growth rate of Kalapara Planning area, the population has been found 17332 in 2011 (BBS 2011) and 16256 in 2001(BBS 2001). Urban and rural growth rate is different of this Paurashava. But in case of Kalapara Paurashava, growth rate of 2011 is 1.62%. 0.49% and 0.18% was the growth rate of Patuakhali district and Barisal Division respectively. Average of district growth rate and Divisional growth rate is very low. Upazila annual growth rate 1.62% is medium growth rate of the Barisal region. It has been observed that the annual growth rate 1.62% is more than three times larger than the district growth rate and more than nine times larger than division growth rate. So, it is feasible to consider 1.62% as the projected growth rate.

Total population in the area on the basis of exponential growth the population will be 18782, 20354, 22056, 23902 in the years of 2016, 2021, 2026 and 2031.

Basic Assumptions

- The characteristics of the more recent periods of development for the local are expected to continue into the future
- The existing density of population, major activities of Paurashava i.e., Trade, Commerce and Service and higher sex ratio reveals the flourishing economic development of the Paurashava in recent years

Methods Used

Population projection has been conducted on the basis of following determined methods and techniques:

- The base year for such above mentioned projection is 2011 as per available census data
- Future population is estimated for the future year 2016, 2021, 2026 and 2031 considering 20 year planning period
- Finally, Exponential Population Projection is used to conduct the Population Projection. Projected growth rate is 1.62%.

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

$$Pn = Po\ (1+ r)^t$$

where

Po = base year population

Pn = projected year population
t = time period
r = annual growth rate

According to Population projection, population of Kalapara Paurashava will be 23902 in the year 2031. Table 6.1 depicts ward wise projected population (2016-2031) of Kalapara paurashava based on 1.62% growth rate.

Table 6.1: Projected Population During the Year 2016-2031

Ward	Population 2011 (base year)	Population 2016	Population 2021	Population 2026	Population 2031
1	3319	3597	3898	4224	4577
2	1501	1627	1763	1910	2070
3	1681	1822	1974	2139	2318
4	1331	1442	1563	1694	1836
5	1193	1293	1401	1518	1645
6	1662	1801	1952	2115	2292
7	1347	1460	1582	1714	1858
8	1824	1977	2142	2321	2515
9	3474	3765	4080	4421	4791
Total	**17332**	**18782**	**20354**	**22056**	**23902**

Source: BBS 2011 and Consultants Estimation

6.3 Identification of Future Economic Opportunities

The city of Kalapara must thrive on its own potential natural resources. Fish resource and agricultural products are very much potential for the area. Food industries can be initialized based on fish resources. There are a number of areas where such prospects can be managed. First, catching fish has to be increased. Second, freezing facilities has to be enhanced. Third fish drugging facilities to be expanded and finally, small and low investment plants for processing fish resources can be initialized. Bangladesh Fisheries Development Corporation (BFDC) has taken effective projects aiming to develop the country's fisheries sector and boost export. Fish landing centers, fish preserving and fish marketing centers for traders would be set up. Warehouse facilities and ice supply for traders would also be extended under this project and ice factories would also be built.

About 18.88% of the total lands of Kalapara Paurashava are devoted for agricultural purposes. So emphasize have to be given on the scientific procedure of agricultural production and these productions may be used as input of agro-based industries.

Economically active labor forces are not being properly used in production sector. This labor force can be utilized in those fishing or agro-based sector.

6.4 Projection of Land Uses

Following data and analyses served as the basis for population and land use projections:

- Provides a reasonable population forecast-based on historic population growth trends considering population census data of 1991 to 2011.

- Existing economic and land use conditions provide an overview of the present economy and existing land use:

  - Economy-provides a general discussion on local economy.

  - Existing land use-data and maps of existing land uses.

- Anticipated the future economic and land use condition-outlines a future scenario of Kalapara Paurashava based on the following factors that will affect the future land uses:

  - Economy-projects future economic and population characteristics.

  - Development proposals-includes development proposals from other public, private sector projects.

  - Agriculture land preservation.

Land requirement

In Kalapara Paurashava, major landuse is Residential (42.20%). Waterbody occupies second position (21.58%) and agriculture occupies third position (18.88%) of the category. A negligible percent (3.26%) land is using for circulation network. Though, agricultural landuse dominates a major portion land use of the Paurashava but, after the preparation of Master Plan, more residential development will be preceded. In consideration of such concept, the Master Plan will be delighted in favor to save the agriculture land.

The Paurashava is not an ideal township due to the agriculture domination. Agriculture, water and tourism based township should be encouraged in the preparation of Master Plan. 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 concept with the encouragement of vertical development. In case of government services, specific building may accommodate different type of offices.

Table-6.2: Projected Population Density (population/acre)

Ward No.	Area in acre	Projected population density (population/acre)			
		2016	2021	2026	2031
1	297.66	12	13	14	15
2	57.27	28	31	33	36
3	73.05	25	27	29	32
4	38.80	37	40	44	47
5	57.56	22	24	26	29
6	36.65	49	53	58	63
7	59.04	25	27	29	31
8	94.65	21	23	25	27
9	229.87	16	18	19	21
Total	**944.56**	**20**	**22**	**23**	**25**

On the basis of projected population, additional demands for land will be calculated for various facilities such as residential, commercial, industrial, educational, etc. Different standards have been considered for determining the land requirements of different land uses.

According to the projected population density it has been observed that in 2031, this area will be a medium to high density area. Though gross density of residential land is being proposed 100-150 persons per acre, gross density 100 persons per acre is considered for the year 2031. Although, the area conceives rural character and existing residential density is medium.

Demand analysis

In case of landuse change, the standard given by the UTIDP, LGED according to the projected population and area for the specific service is being calculated. Vertical expansion of physical development should be emphasized rather than horizontal. In case of road network plan, missing-

links are being prescribed rather than new roads. For the development of pisciculture, all 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.

6.5 Housing

Housing areas in the Paurashava is the composition of an admixer of housing types. Mixed residential, poor dominated rural houses and semi-urban homesteads are found. Most housing areas have been developed in a spontaneous fashion. In the rural part of the Paurashava, with its rural-agricultural character, has a different housing type. The dwellings, comprising homesteads, encompass larger areas having low density. Highest gross population density in the Paurashava is 45 persons per acre. Residential buildings in the Paurashava are dominated by katcha structure. No building is found approved from Paurashava. However, owners of the buildings have been found violated the setback rule by the construction. Except labour charge there is very little variation in building construction cost between Dhaka and Kalapara Paurashava.

Problems relating to the housing are mostly concerned with the poor community. Due to their low level of income a large number of poor are squatting on public land. They are not only deprived of minimum housing but also from the personal security that endanger their health and working efficiency. Regular income can solve most of their housing problems. Apart from dwelling, pure water and transportation are real problems for the inhabitants. Utility services are highly inadequate. Drainage is major problem in rural part of the Paurashava. The Paurashava cannot solve the problems due to scarcity of fund.

Basis of housing projection

Future housing projection and demand have been estimated based on following assumptions:

- Most of the households are in permanent residence but new house or home will be required with the increasing of generation.

- Demand of housing is estimated considering the income-group and number of rental households who willing to buy a house.

- Non-permanent structures will not exist in future.

- Considering rapid growth of population, exponential population projection method is being used i.e. $P_n = P_o (1+r)^n$

Housing demand analysis

The provision of adequate housing in urban areas is necessary to attract and retain qualified and diverse labour force. Appropriate housing also plays an important role in contributing to residents' financial security, amenity and quality of life. The identification and analysis of housing demand assists Paurashava s ensuring that there is sufficient land for new housing and provides direction as to the types of housing that are likely to be needed in the future. Housing demand analysis can also be used as the basis for developing appropriate policies relating to housing mix, density and community form. Housing demand projections is an essential component to determine the associated land area required to accommodate future residents. This projection is also necessary to address national policies related to the housing provision.

The method for forecasting household number or analysis of housing demand is the aggregate method. The formula used for this projection is –

H = P/S

Where, H = Number of households

P = Forecasted population

S = Calculated average household size

At first, Ward-wise existing number of population and dwelling units in the year 2011 have been observed. Using these data, number of households has been projected for the years 2016, 2021, 2026 and 2031. This estimation will assist to estimate the need of dwelling units for future years.

Table-6.3: Projected Number of Households

Ward No.	Average household size (2011)	Number of Households			
		2016	2021	2026	2031
1	4.3	837	907	982	1064
2	3.0	542	588	637	690
3	4.0	456	494	535	580
4	4.5	320	347	376	408
5	4.4	294	318	345	374
6	3.9	462	501	542	588
7	4.1	356	386	418	453
8	4.3	460	498	540	585
9	3.6	1046	1133	1228	1331
Total	**3.9**	**4816**	**5219**	**5655**	**6129**

Source: Estimated by the Consultant.

CHAPTER 7
LAND USE DEVELOPMENT STRATEGIES

7.1 Strategies for Optimum use of Urban Land Resources

Kalapara Paurashava is peri-urban area with urban infrastructures and valuable agricultural lands, water resources. Therefore, in identifying the strategies or possible techniques for optimum use of Urban Land Resources, it is required to understand the urban land characteristics. According to Town Improvement Act 1953 it is required to identify the strategies for optimum use of urban land resources as there exist competition amongst agriculture, urbanization and industrial development.

7.1.1 Land use Zoning

Land use Zoning is a planning tool as it permits the government to select which type of land use should be allowed. The term differs from the 'general plan' that Zoning plan regulates the private developments and general plan controls both public and private developers. Zoning plan is integral part of general plan.

Total area of Kalapara Paurashava is segregated under some broad classes that will basically guide future growth with wide aspects. Definitions of the broad classes are given bellow for conceptualizing focus of the future magnitude as well as illustration of the policies and strategies.

A. Agriculture
B. Core Area
C. Peripheral Area
D. Fringe Area
E. New Urban Area
F. Major Circulation Network
G. Water Body

Table 7.1: Broad Land use Zones

Zoning	Description of Zones	Area (acre)	%
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.	93.02	9.70
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.	99.47	10.38
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	207.86	21.68
Fringe Area	This zone is developing areas which will take further decades to reach the population densities of the urban core area. Low initial densities in these areas do not justify supply of a full range of services as they will initially be underused. However, it is essential that planning and reservation of rights of way, at least for	172.63	18.01

Zoning	Description of Zones	Area (acre)	%
	primary networks, be undertaken soon to enable provision when justified by increased density levels and allowed by resources.		
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.	47.69	4.98
Major Circulation Network	Major circulation contains major road network and railways linkage with regional and national settings.	142.33	14.85
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.	195.53	20.40
Total		**958.53**	**100.00**

Source: Consultants Estimation

Agriculture

93.02 acres land out of total 958.53 acres is for agricultural use under structure plan in Kalapara Paurashava. Maximum portion of agriculture is in ward no. 1 and 9.

Core Area

99.47 acres (10.38%) land out of total 958.53 acres is proposed here as core area covering ward no. 1, 2, 3, 4 and 6. Among these five wards, ward no. 1 and 2 has maximum portion of land of core area.

Fringe Area

172.63 acres (18.01%) land out of total 958.53 acres is proposed here as fringe area covering Ward no. 3, 4, 5, 6, 7 and 8. Maximum portion of Fringe Area is in ward no. 7 and 8.

New Urban Area

47.69 acres (4.98%) land out of total 958.53 acres is proposed here as new urban area covering only ward no. 1.

Peripheral Area

207.86 acres (21.68%) land out of total 958.53 acres is proposed here as peripheral area covering Ward no.1, 3, 4, 5, 7 and 9. But among all wards, ward no. 7 and 9 has maximum portion of land of peripheral area.

Map 7.1 shows the structure plan of Kalapara Paurashava.

7.1.2 Land Acquisition and Requisition

Land acquisition is a process in which a public agency or non-profit land conservation organization purchase all the ownership rights vested to the land from a willing seller. In every case, land acquisition must mean the transfer of ownership. For implementation of any urban development program, availability of land and its control are necessary not only for future growth but also for a large number of public uses. In Bangladesh, Land Acquisition Act, 1894 is one of the most important legal tools. But as the law failed to meet the emergency needs for requisition of lands, the Acquisition and (emergency) Requisition of Immovable Property Ordinance, 1982 has been come in forth.

7.1.3 Policy Formulation

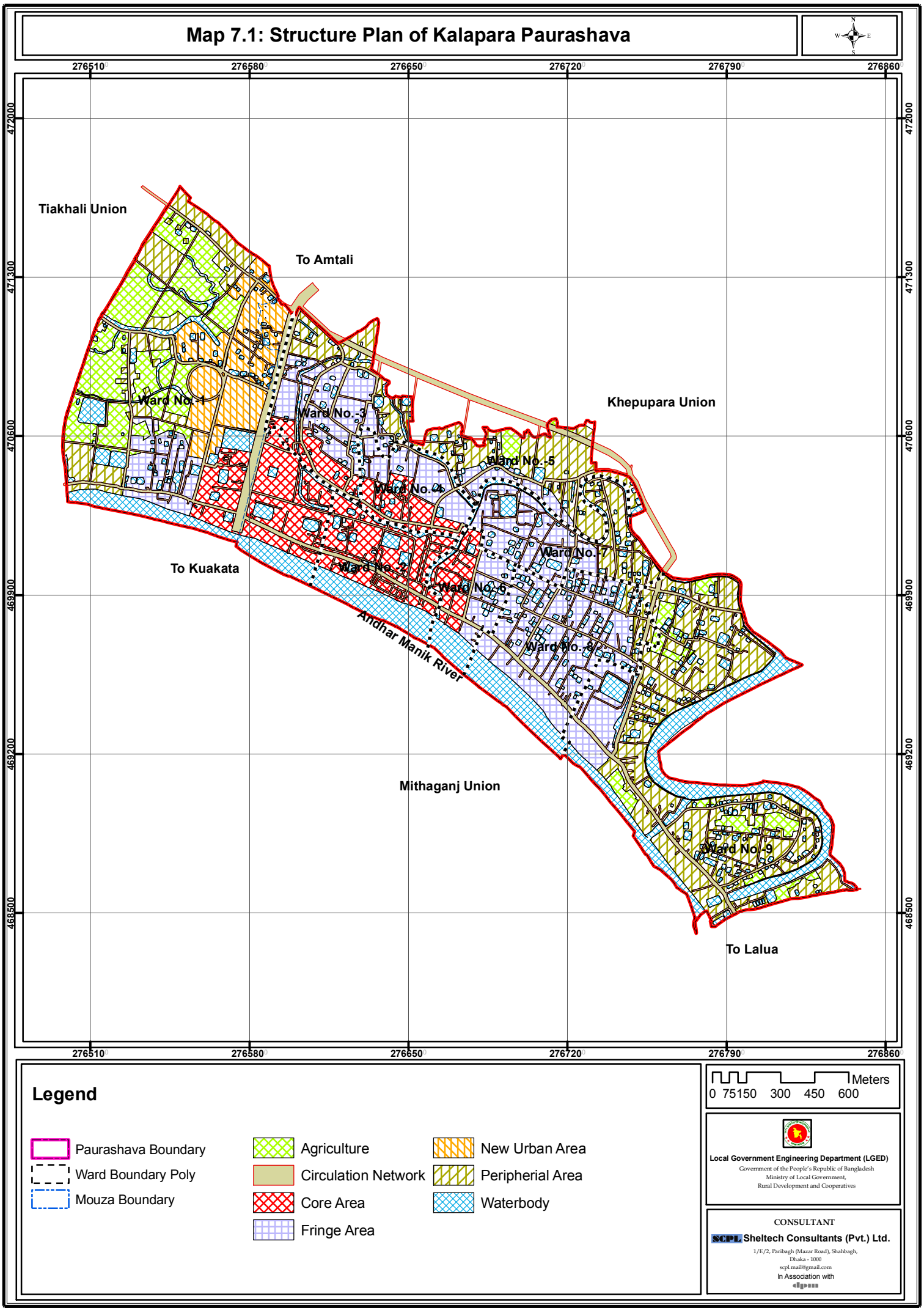
Apart from this the recommendations for Road networks can be adopted from the recommendation from national relevant policies. This will direct the future land use pattern.

7.1.3A Planned Development of Undeveloped Areas

Land Readjustment

It is a community building project of resident or for residents where: Land for public facilities is contributed fairly from land owners and lease holders. Where part of development benefits are provided by land owners to an implementing body to finance project cost, not in cash but in the form of reverse land.

Map 7.1: Structure Plan of Kalapara Paurashava



Legend

- Paurashava Boundary
- Ward Boundary Poly
- Mouza Boundary
- Agriculture
- Circulation Network
- Core Area
- Fringe Area
- New Urban Area
- Peripherial Area
- Waterbody

Meters
0 75150 300 450 600

Local Government Engineering Department (LGED)
Government of the People's Republic of Bangladesh
Ministry of Local Government,
Rural Development and Cooperatives

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In Association with

Guided Land Development

It is a land management technique for accelerating the provision of serviced land through partnership between public sector and local communities. Its main objectives were to ensure;

1. fair return on investment to the private owner/developer;
2. a relatively large proportion of serviced sites for allotment to low income families; and at the same time,
3. recover at least part of offsite infrastructure cost for the public agency.

Site and Service

This sort of design provides the low-income people or target group with a plot and basic infrastructure. The beneficiaries either buy or lease the allocated land. Often they are provided with loan for the construction of houses.

7.1.3B Redevelopment of Developed Areas

Land Sharing

The principle behind this has been that the land is shared equitably between the land owner and the tenants (quasi). The land owner develops the land in such a manner that the original inhabitants in that area are given shelter in the very same area, lands for public facilities is made available to the planning agency and the remaining area is developed and sold freely in the market.

Slum Improvement

It provides land or housing to the urban poor near their work place. The scheme is also applicable to land reserved for public purposes on the condition that land on reduced scale is made available for the reserved purpose.

7.1.4 Different Fiscal Measures

Property Tax

Property tax has been the principal tax related to land and buildings. This tax according to provisions of Paurashava Act, 2009 is levied on the annual ratable value which is to be determined on the basis of area of lands or buildings.

Betterment Levy

The policy measures which can achieve optimum use of urban land use in practice still remain to be sharpened and coordinated. The measures can be classified as a) direct government investment b) legal and regulatory; and c) fiscal. Examples of these are:

1) Direct government investment in land development for provision of infrastructure, housing or overall town development through large scale compulsory land acquisition or other land development scheme
2) Statutory provisions for compulsory acquisition of land at less than market price, regulations regarding land use zoning, development control and building codes for health and safety
3) Fiscal measures in the form of appropriate taxation that can help achieve the land policy

7.2 Plans for New Urban Area Development

Kalapara Paurashava is not an ideal township due to the agriculture domination. Agriculture based township should be encouraged in the preparation of Urban Area Plan. 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 concept with

the encouragement of vertical development. In case of government services, specific building may accommodate different type of offices.
Future landuse will be calculated according to the development control for the masses. In case of public land, existing use and khas land will be emphasized. Willingness and participation of the people in development activities will be the key factor for future landuse demarcation. Slow change of landuse will be 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 will be 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.

The agriculture land should be preserved (according to the Agriculture Policy) as much as possible from any type of physical development. It should not be decreased with the expansion of habitable area or formation of new settlement, may be increased with the formation of char lands. In case of road, embankment, drainage and new urban area, the agriculture land may be used but such use should be guided according to this plan. For the development of pisciculture, all ponds (not lower than 0.3 acres) and ditches may be preserved, in some exceptional cases; small number of ditches and ponds may be used for physical development activities.

People's willingness will be considered as important base for the projection because the Master Plan is for the inhabitants of the Paurashava. They will be the beneficiary group of that Master Plan. Their willingness in case of use and land allocation, location, expansion provision will be the important consideration. On the basis of fulfillment of their demand, they will like to involve them willingly in the implementation procedure of the Master Plan.

Policies and Strategies

A large number of constraints are involved with the development of new area. Following strategies are involved with the development of new areas:

- Low incomes;
- Difficulties associated with assembling parcels of land which are large enough to make viable development sites;
- Disputes over ownership;
- Absence of private sector land developers;
- Lack of access (capable of resolution often only by works on land under the control of others); and
- The need in most cases for land to be prepared in some way prior development either by filling where it is subject to flooding or by earth moving where it is too steep to develop. In both cases, drainage works have to form an essential part of the land preparation task.

The policies and strategies of the Paurashava related to new area development are –

Explore and Implement means of increasing the number and pace of public sector land development projects: This is one area where government can have a direct influence on accelerating the rate of conversion of non-urban to urban land.

Explore and Implement, with the private sector, means of increasing the number and pace of private sector land development projects: In moving towards realization of the objective of government supporting the private sector in its development role (i.e. acting as an enabler rather than a provider), the Paurashava will examine, with the private sector, the means of overcoming the constraints to new area development.

Realization of the above two strategies is likely to require changes in legislation and administrative procedures at the national level. The other strategies of the Paurashava relating to new area development are set out below.

Promote upgrading of the existing urban area: As densities within the existing Paurashava Town increase, there will be growing pressure for upgrading to ensure that infrastructure provision is adequate and that living conditions are acceptable.

Most of the parts of the Paurashava are in agriculture practice and few parts are in urban area will require no upgrading at all. Accordingly the Paurashava will set priorities throughout the study area and ensure, through its own efforts or the efforts of others, that upgrading projects are necessary. Obvious areas for early consideration will be slum and squatter settlements. Local community and NGOs may involve with the upgrading projects.

Ensure that land is available for all income groups: In accordance with Government's commitment to poverty alleviation, as expressed in the Poverty Reduction Strategy and the objectives of the National Housing Policy, a further major task facing the Paurashava is to ensure that land is made available for all income groups.

Reconsider the role that development control plays in the planning and management of new area: Where development control is institutionally well-established (with adequate legislation, administrative resources and enforcement power) it can be a very effective 'tool' in restricting new area development where it is considered unsuitable; encouraging it in areas where it is considered suitable; and influencing the type of development that takes place in any particular location. It can attempt to strengthen development control institutionally to enable it to perform its role more adequately. On the other hand, it can consider restricting the role of development control to those functions which it considers critical such as ensuring that development does not take place in corridors required for new road construction or road widening, or ensuring that polluting industry takes place only in areas which are suitable for it.

Encourage the development of unused or underutilized land rather than new areas: The Paurashava is characterized by having much unused or underutilized land within the heart of the town. This land represents a wasting asset. If maximum use is to be made of the existing investment in infrastructure and if journey times are to be kept short, then fuller utilization of this land is essential. The Paurashava will examine the reasons why such land remains unused or underutilized and will endeavour to overcome the constraints to its development.

7.3 Areas for Conservation and Protection

In Kalapara Paurashava, there are no heritage sites within the Paurashava area. One of the major land uses of the Paurashava area is the agriculture which covers about 18.88% of total area. The agricultural land is direct and indirect source of income and has a great contribution to trade and commerce of Paurashava. It has been observed that among all wards, ward no. 1, ward no 5 and ward no. 9 have about 68.81%, 8.84% and 13.20% coverage of total agricultural land area and ward no. 1, 8 and 9 have about 24.22%, 13.09% and 31.89% coverage of total water bodies area.

Other feature which requires protection is the water bodies of the Paurashava. Though encroachment rate of the Khals/drains by the unauthorized construction and cultivation on the bed of khals including aqua-culture is very low, but due to lack of regulations, encroachment may occur in near future. Besides with the appropriate use and management of these natural lines, it might be possible to manage the drainage situation of the area. In addition, Water Reservoir Act, 2000 should be followed in preservation of these water bodies as per requirement. Most of water bodies are using at present for fishing purpose. So, the preservation of these water bodies not only required for drainage but also it will be potential for economic activities.

CHAPTER 8
STRATEGIES AND POLICIES FOR SECTORAL DEVELOPMENT OF THE PAURASHAVA

8.1 Socio- Economic Sectors

From the population projection it has been observed that about 6570 additional population has to be accommodated in the existing planning area during the plan period. Average density of population will be 25 persons per acre.

8.1.1 Population

Policy-01: Density Control

Justification: Kalapara Paurashava is remote southern area. Its density is medium with respect to other Paurashava of southern region context about is 4537.17 person /sq.km (18 persons per acre). It is required to control the density of Paurashava through effective measures of planning.

Promotion: To make a successful implication of this policy, following strategies should be undertaken:

- Effective Land Use Plan for 2031 following standards and potentiality of land use under Urban Area Plan

Implementing Agency: Paurashava.

Policy-02: Densification of Residential areas through people's participation

Justification: Densification of population within the Paurashava area through zoning. Land price is comparatively high in central part of the Paurashava. Housing category need to be decentralized through effective measures of planning.

To make a successful implication of this policy, following strategies should be taken:

- Core area should be preserve for high income group through high land price. Core area comparatively highly dense area and vertical expansion is proposed for this area.
- Periphery portion where land price comparatively low can be declared for low income group.

Implementing Agency: Paurashava, Ministry of Planning

Policy03: Creation of trained grassroots level family planning workers for motivational works

Justification: Grassroots workers can give door-to-door motivational services to the local people.

Implementing Agency: Ministry of health and family planning, Ministry of Mass Education.

8.1.2 Economic Development and Employment Generation

Kalapara Upazila is dependent on Small Business and services through direct or indirect involvement. Cyclone, water logging and subsequently salinity problem is common in Kalapara.

Emphasis is required for accelerating the economic development trend by restoring the economic base of the Paurashava.

Policy 01: Promote Agro based Industries in the Growth Centers or Rural Areas

Justification: Growth centers are to become economic hub of their rural settlements. Provision of agro based industries will provide ready market of agricultural products of the rural community.

Implementing Agency: Ministry of Agriculture and Ministry of industry.

Policy 02: Light Industries need to be developed to flourish the industrial sector development

Justification: To accelerate the economic development of Kalapara Paurashava in long run, it is required encourage the industrial establishment within Paurashava area.

To control the haphazard industrial development some measures will be undertaken:

- Follow the category of industries as categorized by DOE (Green Category) and Bangladesh National Building Code (low and medium category hazards)
- Follow Bangladesh National Building Code, 1993 and Building Construction Regulation, 1952 (amendment in 1996) for providing Road, setback before construction of any industrial structures
- Following the Coastal Zone Management Policy, 2005 all industrial units will be required to install built-in safeguards against pollution within a given time-frame. Units failing to comply with the pollution standards will be required to pay “green tax” for cleanup of the environment polluted by them

Implementing Agency: DOE, BSCIC

Policy 03: Support SME for creation of jobs and economic upliftment

Justification: Short and medium size enterprises are essential for the promotion of economic activities. The SME sector will support the large investment in many ways which help the process of their development.

Implementing Agency: Ministry of Industry, Ministry of commerce, Private Sector initiative.

Policy 04: Employment Generation through development of potential sectors

Justification: To sustain economic activity of Paurashava people for longer period. The economic activity of existing Kalapara Paurashava is oriented with mainly small business, Fishing and Water-way Transport Sector in some extent. Proper planning and co-ordination among these sectors and future potential sectors it would be possible to engage active labor force.

Following measures will be encouraged to implement this policy implication:

- Industrial Zone declaration in Land Use Zone (mainly light industries)
- Infrastructure development to flourish fishing industry (Market, Ice Factory, Storage facility, electricity supply etc.)
- Involvement of active labor force and community participation in different management activities of Paurashava such as solid waste management in transferring the wastes from Solid-waste transfer sites, road maintenance, public sanitation

Implementing Agency: Paurashava**,** DOA, Settlement Office (Land Office).

Policy 05: Declared new industrial zone

Reason: For economic improvement it is expected to increase industrial activities. At present 16.72 acres land is devoted for industrial purpose and 20.21 acres land is proposed for this purpose. According to BSCIC, at least 10 acres of land is required for per Paurashava.

Implementing Agency: Paurashava, BSCIC / Private Sector

8.1.3 Housing and Slum Improvement

Pourahava, NHA and other public agencies can pursue the following policies to develop the housing needs and planned development for housing units. But there is no local office of the NHA to execute housing program at upazila level. Paurashava can facilitate housing areas with site and services in designated housing zones.

Policy-01: Making provision of affordable housing for the low income people

Justification: Paurashava has to think about the housing facilities for the low income people. Private sector will be operated for profit earning, the low income people will not access to these scheme. Thus to reduce unplanned development, the development authority may take initiative for low income people. Also by providing services the general people can be encouraged to build their own houses.

Implementing Agency: Paurashava. NHA

Policy02: Planning interventions in the spontaneously developed areas.

Justification: Most of the housing areas in Bangladesh were developed within any planning intervention. Planning intervention must be undertaken for the improvement of residential and other areas. Authority must make some necessary intervention in these areas to provide basic services.

Following controlling measures will be considered in providing housing areas in Kalapara Paurashava:

- Follow Private Residential Land Development Regulation, 2004 in Housing Development as mentioned in Land Use Plan under Urban Area Plan Section
- Conservation of the natural environment and preservation of cultural heritage in new housing projects
- Housing Schemes will be proposed following different land development instruments such as:
    - Redevelopment schemes
    - Site and Service schemes
    - Guided Land Development schemes
    - Land Sharing schemes

Implementing Agency: Paurashava**,** NHA.

Policy 03: Continuous monitoring of land and housing market

Justification: The authority should monitor the principle aspects of land and housing market through data base. The Paurashava and land registry office can maintain data base and can undertake studies from time to time using GIS data base.

Implementing Agency: The Paurashava and land Registry office

8.1.4 Social amenities and Community Facilities

All social and community facilities like health, education, religious, community centre and other facilities are included in this category. In terms of number and size of facilities the allocation land with approximate location can be determined by analyzing the pattern of existing facilities and the calculation of the requirements in future. In addition some policies recommendations were made on health, education and other facilities.

Policy: Social Amenities and community facility will be provided as per requirement of existing and forecasted population.

Justification: To enhance access to land with secure tenure and to promote a social lively environment for an increasing population. Both Public and private sector investments are encouraged

Provision of standards, rules and regulations are followed in allocating Educational Religious, Community Centre and Other components in Land Use Plan of Urban Area Plan.

Implementing Agency: Paurashava, NGO, CBO

8.1.5 Recreational Facilities

Policy: Ensuring Community level Recreational facilities

Justification: To provide a livable environment for the Paurashava people, community level recreational facilities should be preserved. In long run, preservation of recreational lands for future generations should be ensured. At present, only 0.38 acre is devoted for Recreational facilities. Parks should be created at central and at neighborhood level through Master Plan and Ward Action plan.

Both public and private sectors investment is encouraged.

Standard wise recreational facilities such as Play ground, Neighborhood parks, Stadium, Cinema hall will be provided as described in Land Use Plan of Volume II.

Implementing Agency: Paurashava, Public / Private sector

8.1.6 Safely and Security

Considering the present law and order situation and its impact on the urban life it is necessary to face the challenge of restoring law and order. The major responsibility o these tasks rest with police department. Law and order in the Paurashava and its surrounding has to be ensured.

Policy: Improvement of law and order services for all citizens

Justification: Improvement of law and order is a national issue. Anyway local level community policing can be organized for ensuring security at local level.

Implementing Agency: Paurashava, Home Ministry.

8.2 Physical Infrastructure Sectors

8.2.1 Traffic and Transportation

Traffic is the function of landuse. It is also mention here that traffic network and the traffic generated induces the growth of landuse. Road networks will play strategic role in opening up undeveloped areas of the future term and shape up its structure. There is an interrelation between road network and utility services which together play key role to guide physical development in the town and Paurashava.

Policy 01: Develop efficient inter town or inter Paurashava communication facilities

Justification: To avoid traffic congestion within the Paurashava, the road has been widened to 100 feet that goes to Amtali and Kuakata towards North-South direction. This road has considered the primary entrance of the Paurashava.

Participatory approach will be developed to realize at least a part of the cost of the development from the beneficiaries. This will also help to reduce delay and cost involved in land accusation procedure.

Implementing Agencies: Paurashava, RHD

Policy 02: For better accessibility transport terminals should be located at major roads of the Paurashava.

Justification: To develop and facilitate easy means of transport consultant suggest the promotion of public transport.

Implementing Agencies: Paurashava, RHD

Policy 03: Improvement of existing road and water transportation network.

Justification: To develop an efficient Regional Transportation Network and flourish.

Roadway Network: At present, Kalapara Paurashava is connected in north and south (Amtali and Kuakata) directions and these roads maintain connectivity with the outside areas of Paurashava. Due to lack of infrastructure facilities, travelers often suffer from long and tedious journey by Road.

Water way Network: Water transport network of Kalapara Paurashava has a potential importance in carrying both people and goods.

In promoting Regional Transportation Network System, some controlling measures will be followed:

- Existing Kalapara Highway Road should be widened considering the RHD Standard manual as per category of Roads and determined Level of Service (LOS) in up to 2031

Implementing Agency: RHD, LGED, BIWTA.

Policy 04: Functional and Hierarchical Road Network Development

Justification: Road Network has been developed without following any planned pattern.

Controls: Following the existing condition, of Kalapara Paurashava, some strategies will be persuaded before incepting the Transportation Development Plan.

- Make a priority for in Space Allocation of ROW for better space utilization and promoting non-motorized traffic avoiding interruption, ensuring speed with motorized traffic
- 10-20 ft. plantation beside the Highway Road will be proposed `for ensuring safety of people of beside Highway Road
- The Road Hierarchy of Kalapara Paurashava will be modified and proposed on the basis of Road width Standards as described Chapter 2, Transportation and Traffic Management Plan, Volume-II.
- Follow up the basic rules mentioned in Building Construction Act, 1996 at Major Intersections of the Paurashava. Some basic rules are:

- ✓ In each Corner plot of major intersection 1m×1m land area has to be open for traffic movement

- ✓ At the cross section of two or three roads within 50 meter distance, construction of commercial complex, Cinema Hall etc. are prohibited. But, 500 square meter area in total is permitted for commercial purpose (Shopping Complex), road width is 23 meter or greater

- Promote efficient traffic management system within Paurashava by pursuing Regulatory measures (parking control and speed control in Highway Road, access control of trucks in Paurashava area,) and Design measures (Details of lay-out of Proposed Primary Road and Secondary Road in Paurashava area, use of lighting equipment etc.) in Paurashava Road Transportation System

Implementing Agency: RHD, LGED, Paurashava.

8.2.2 Utility Services

Policy 01: Facilitating access for all citizens to basic level of services in water supply and sanitation

Justification: To reduce the incidence of water borne diseases and increasing the present coverage of safe drinking water by lowering the average number of users per tube well.

- Facilitate safe drinking water supply and safe sanitation to each household as per demand in 2031 through various means, including:

  - Piped Water Supply System
  - Water treatment plant, Overhead Tank
  -Rainwater Harvesting and Conservation (especially south-western region)

Prescribed Standards have to be followed in providing facilities as mentioned in Urban Area Plan under Plan for Urban Services.

Implementing Agency: DPHE, Paurashava.

Policy 02: Facilitating access for all citizens to electricity supply

Justification: According to BBS, community series 2011-Patuakhali, at Kalapara Paurashava, about 87.1% (4274 households) of the total households has electricity connection. Besides, to accelerate the industrial development (Agri-based, fishery) in Kalapara Paurashava electricity, gas supply must be ensured.

Consumption of wood and other natural resources based fuel will be reduced. Also alternative energy sources will be encouraged (biomass, solar etc.)

Implementing Agency: PDB, REB

8.2.3 Flood Control and Drainage

Policy: Incepting Drainage Network Plan in response of Water logging problems

Justification: Lack of adequate and planned drainage facility in Kalapara cause Water logging problem. The depth of maximum internal inundation ranges from 2-5 ft and duration varies 3 to 4 hours.

Following strategies should be reflected in Drainage Network Plan:

- A planned Drainage network will be provided in Drainage and Environment management Plan considering the standards, appropriate method and formula
- Regular maintenance of existing man-made and natural drainage network with Community involvement
- Illegal encroachment of Water bodies by Water Reservoir Conservation Act, 2000 ensuring storm water drainage
- Scattered throw of solid waste in water bodies by proper solid waste management activities

Implementing Agency: Paurashava, BWDB.

8.3 Environmental Issues

The Policies will strike a realistic balance between the existing livelihood requirements of the people and round environmental resources management that can ensure the livelihood in long term.

8.3.1 Natural Resources

Policy: Preservation of natural Water resources

Justification: To ensure natural water bodies and fish resources which are crucial to sustain the livelihood and to retain the eco-system.

Small and large sale fisheries Communities/Groups will be given incentives, training program will be developed on new and modern fish harvest techniques, conservation, distribution, pursing.
Permitted land use will be maintained in the demarcated areas that are as follows:

- Irrigation
- Provision of water way transportation in wet season
- Fishing/Fish Culture

Implementing Agency: BIWTA, BWDB, Paurashava, DOA.

8.3.2 Sanitation

Policy: Ensuring Safe Sanitation to Citizen

Justification: In Kalapara Paurashava, the sanitation condition of Paurashava is not so much satisfactory. There exist two types of latrine viz. katcha and Pucca. Besides, dumping of solid wastes in a scattered way is a common phenomenon.

Following strategies should be promoted in ensuring sanitation:

- Dumping Site and solid waste transfer sites demarcation in Land Use Plan of Paurashava area ensuring effective management including community participation
- Proposal of Solid Waste Dumping site
- Installing public toilets in schools, bus stations, launch Terminal, Markets, important public places and community latrines in densely populated poor communities or slums

The illegal connection of existing latrines with drains needs to be controlled through proper monitoring and in future

Implementing Agency: Paurashava, DPHE, LGED.

8.3.3 Hazards

Policy: Identifying the hazard risk zones

Justification: As Kalapara Upazila is a coastal town, Cyclone is the frequent hazard and flood is the secondary impact and most apparent impact accrued from Cyclone Hazard. During Cyclonic hazard the level of water is raised up to 8-10 ft (<=3.05 m) (maximum). Therefore, strengthening disaster preventing and mitigating mechanisms to enhance the coping capability to the Poor in times of natural disaster is vital in this Paurashava context

Environmental Management Plan will be prepared under Urban Area Plan for all possible hazards (Cyclone, Flood, River Erosion, etc.). The Plan will provide the adaptation, prevention (structural/non-structural measures), mitigation, Preparedness techniques against a natural disaster through comprehensive disaster risk management.

To reduce the impact of hazards same manures will be undertaken which are as follows:

- Embankment, flood control sluice gates and other structural measures
- Early Warning System
- providing of multi-purpose cyclone shelter

Implementing Agency: Paurashava, BWDB, LGED.

8.3.4 Environmental Aspects

Policy: Pollution Control

Justification: Pollution level such as water, air and soil pollution rate is very low. As the area is located in coastal region, saline and iron also contaminate the water but at negligible rate. Besides air and soil pollution rate is also negligible. But this should not allow increasing pollution rate. To ensure safe environment for the Paurashava area, maintenance of the surface water quality is vital.

To control pollution following measures will be required:

- Make free surface waters form domestic wastes and other types of wastes which require proper solid waste management
- Riverside dumping needs to be restricted and dumping site has to be located through prescribed land use planning
- Discourage the high hazarders industries (Only Green Category Industries of DOE)
- Excessive pesticides and fertilizers use in Agriculture field cause soil pollution, therefore it is required to follow the Pesticides law, 1985

Implementing Agency: Paurashava, DPHE, DOE, DOA.

CHAPTER 9
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.

9.1 Institutional Capacity Building of the Paurashava

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

- All urban local governments including *Upazila* level Paurashavas must be given more independence and autonomy to perform their responsibilities. At the same time, their accountability to the government and people regarding their performance has to be ensured. For this purpose the legal framework of the urban local governments has to be reviewed and updated. The legal provisions have to be consolidated and simplified and make them compatible to changing circumstances. Opportunities must be created in the Act allowing scope for privatization of service providing activities.
- To avoid duplication of development functions, there should be clear line of separation between central government and the urban local government.
- A double entry cash accounting system has to be introduced to modernize the accounting system. For this purpose, massive training programme has to be arranged for the relevant municipal staff.
- To improve revenue collection, the urban local governments should be given more power and responsibilities. Measures should be taken for strengthening the Paurashava administration for municipal development.
- Section-50 of the Local Government (Paurashava) Act, 2009 needs to be revised and more power should be given to the Executive Officer for appointment of employees.

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

The present plan package imposes a large number of development projects on Kalapara Paurashava for implementation. Paurashava will not only be the custodian of the plan, it will also directly implement much of the development projects. Besides, it will also be responsible for monitoring and implementation of the development projects by other urban development and service giving agencies. This situation calls for strengthening of the existing capability of Paurashava.

9.1.1 Staffing and Training

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

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

9.1.2 Lack of Automation

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

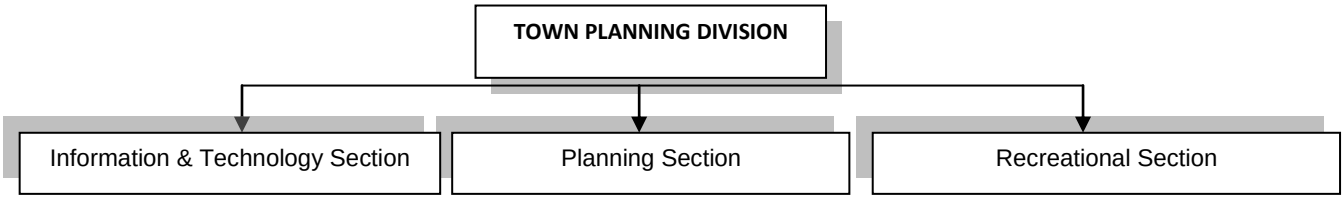
9.1.3 Town Planning Capacity

9.1.3.1 Institutional Framework

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

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

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



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 Paurashava

-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 Paurashava website.

-Providing support for MIS.

-Establishing GIS set up and database for practicing in Paurashava 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 a regular 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 initiation of updating those projects on a regular basis each year.

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 Paurashava.

-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, Paurashava 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.

Fig 9.1: Scope of Work for Planning Division

9.1.3.2 Lack of Paurashava Town Planning Capacity

At present, the Paurashava has no town planning section or any appropriate manpower to prepare and implement the Master Plan. For proper implementation of the Master Plan for each Paurashava under UTIDP, establishment of a separate planning unit 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.

Kalapara is a 'B' class Paurashava. For the 'B' class Paurashava Government approved an organogram/ manpower requirement. If we compare the existing manpower with the approved organogram we find that there is a huge gap between the two. Many positions have been vacant since the inception of Paurashava. However, strengthening of the Town Planning Division is a pre-requisite for successful implementation of the Master Plan. 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.

9.1.4 Legal Aspects

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

9.1.5 Good Governance in Legal Provisions

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

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

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

9.1.6 Financial Issues

Governance in Kalapara 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 Kalapara Paurashava.

Revenue Management

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

Paurashava's Financial Capacity and Plan Execution

The main focus of Paurashava financial governance is to establish automation in entire financial management. This includes computerization of accounts system, holding tax management, and billing of different service charges. Software for above functions have been supplied and installed

in the Paurashavas covered by financial automotive projects. The projects also provided training to the relevant staffs for functioning of the systems. With the implementation of these projects people can now instantly know about the status of their tax payment, bill payment, and licensing. This has not only made the functions of the Paurashava easy, but also has freed the citizens for paying bribe, and experiencing hassle.

The size of annual budgets of the Paurashavas indicates the poor financial status of the Paurashavas. With low income, Kalapara 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 cannot raise its own revenue adequately, it will not be able to execute much of the development projects under the Master Plan.

9.1.7 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 Kalapara 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.

9.1.8 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 Kalapara 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.

9.2 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 meagre. For the same reason, revenue earning from betterment fee, planning permission and other sources may also remain low. Paurashava is heavily dependent on the government for executing its development projects as it is unable to collect sufficient revenue from its tax and non-tax sources. Therefore, it is clear that execution of development projects under the current plan will depend heavily on the government response to supply adequate fund. This situation calls for increasing revenue earning by generating new revenue sources.

9.3 Concluding Remarks

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

Part B. Urban Area Plan

9.2 Resource Mobilization

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URBAN AREA PLAN

Introduction

Urban Area Plan is aimed to guide physical development of Kalapara Paurashava including its economic and social activities. The plan adhere policy directives spelled out in the Structure Plan. The 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. Preparing landuse plan on a cadastral map, the Urban Area Plan considers 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 Terms of Reference (TOR) specify (Pg. 6. Article 4) that the Urban Area Plan (UAP) / Multi-sector Investment Plan (MSIP) will consist of the following plans:

- **Landuse Plan**

- **Transportation and Traffic Management Plan**

- **Drainage and Environmental Management Plan**

- **Plan for Urban Services**

The Urban Area Plan is presented in both, map and textual format. The plan map is presented in 1:1980 scale, super imposed 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.

Urban area plan is broadly divided into two parts, plan map and explanatory report. The plan map depicts future landuse zoning, infrastructure development and other development proposals. Report elaborates all proposals proposed in the plan, including rules, regulations and recommendations for implementation of the plan.

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 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.

Though the total Paurashava area is about 944.56 acres (3.82 sq.km) according to the gazette notification, Urban Area Plan will cover whole area of this Paurashava. The reason behind choosing such areas lays in fact that urbanization takes place whole areas of the Paurashava, where there is still scope and possibility of urban development in near future.

Paurashava operates all parts where it provides basic urban services and facilities. Considering future urbanization trend and potential development projected population is assumed 23902 for 2031.

The Urban Area Plan covers nine Ward Action Plans also.

CHAPTER 10
LAND USE PLAN

10.1 Existing and Projected Land Use and Land Use Proposals

Land use Planning rules are statutory rules to control land use according to planning standard. It is based on land use policies including Local Plans, such as residential density, road standard, provision of infrastructure and services. The relevant Acts and Master Plans of the cities are the legal instruments, which is in force with regard to exercise planning control and standards. Therefore, future land use of Kalapara Paurashava is shaped by intermingling relation between existing and proposed land use.

10.1.1 Existing Land Use

The existing land uses of the project area are shown in Table 10.1. In the land use pattern of the Paurashava, 16 types of land uses are found. It is clearly evident from the table that residential landuse (42.20%) dominates the Paurashava area, followed by water body (21.58%), agriculture (18.88%), urban green space (5.08%) and circulation Network (3.26%). **Map 10.1** shows the existing landuse of Kalapara Paurashava.

Table 10.1: Existing Land use of Kalapara Paurashava

Land use	Area (acre)	%
Agricultural	178.33	18.88
Circulation Network	30.82	3.26
Commercial	22.08	2.34
Community Services	10.26	1.09
Education and Research	13.31	1.41
Government Services	17.21	1.82
Health Facility	2.02	0.21
Industrial/ Processing and Manufacturing	16.72	1.77
Mixed Use	0.47	0.05
Non Government Services	0.43	0.05
Recreational Facility	0.38	0.04
Residential	398.57	42.2
Restricted area	1.35	0.14
Transport & Communication	0.78	0.08
Urban Green Space	47.97	5.08
Water Body	203.86	21.58
Total	944.56	100

Source: Land Use Survey, 2013

10.1.2 Estimation on the Requirement of Different Land Uses

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

10.1.2.1 Land Use Standards

According to the projected population density it has been observed that in 2031, this area will be a high density area. On the basis of projected population and considered the planning standard additional demands for land had been calculated for various facilities such as residential, commercial, industrial, educational, public land, etc.

Agricultural lands, Water bodies will be preserved as existed unless lack of land availability is observed in providing urban services. In that case, non-productive agricultural lands can be devoted for specific urban services and also to control the density of the Paurashava area.

10.1.2.2 Land Requirement and Proposal

After the projection for the target year and analyses of existing Land Use, designation of different land uses is the foremost vital step to prepare Land Use Plan as the first component of Urban Area Plan. Before incepting the Land Use Plan for the year 2031, basic principles for different category of Land Uses have been considered. In precedence, future land use designation and land use zoning have been identified. Finally, Implementation, Monitoring and Evaluation issues have been discussed as the steps after the plan completion to make the Land Use Plan perpetual through plan period.

To allocate the land in Urban Area Plan, one uniform planning standards has been followed and also some basic assumptions have been identified considering Land use Category. The population growth, existing growth direction, economic sector and overall Paurashava Context have been emphasized in Urban Area Plan. The assumptions are mainly reflection of Building Construction Act, 1952 (amendment 1996) which is the practiced law in Kalapara Paurashava for approving Building plan or site plan. Sixteen Land use categories had been considered for Survey and interim phase but for Land use plan nineteen categories have been considered. Detail analysis of required land based on the standard provided by PMO, LGED is presented in the Table 10.2. Detail Land use plan has presented on **Map 10.2** and **Table 10.3**.

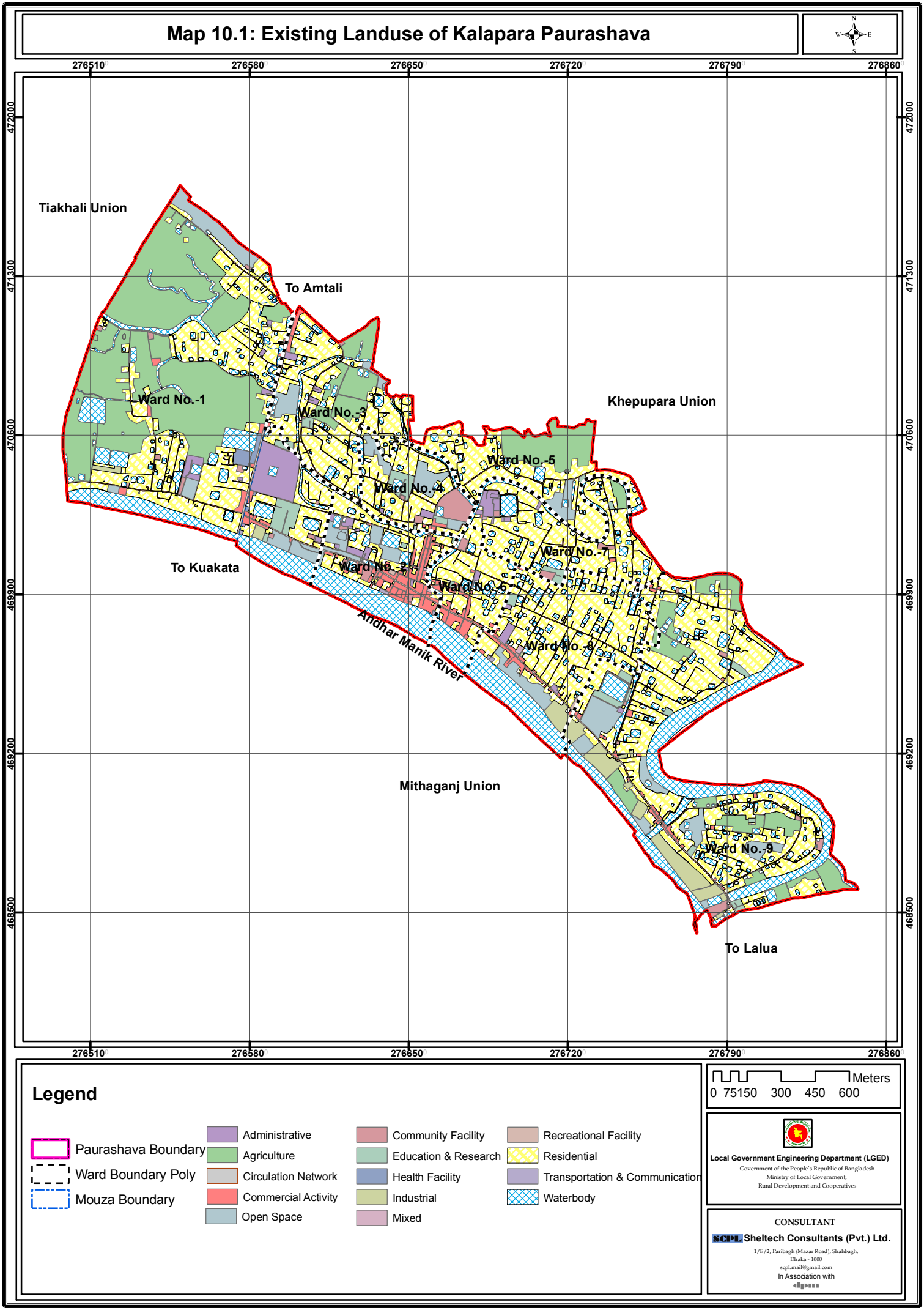
Table 10.2: Proposed Major Land use of Kalapara Paurashava

Sl. No.	Land use Category	Remarks	Area (Acre)	%
1	Administrative	All Government Offices except large scale service based offices as Civil Surgeon Office, DC Office, Police Box, Police Fari, Police Station, LGED Office, Paurashava Office, Settlement Office, Union Parishad Office, Upazila Headquarter, BADC Office, Fisheries Office, Ansar/VDP Office, Agriculture Office, Zila Parishad Office, Post Office, Telephone Exchange Office and Other Government Offices.	23.08	2.40
2	Agriculture	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.	92.82	9.64
3	Circulation Network	Road and Rail communication	141.88	14.74
4	Commercial Zone	The land used for commercial activities is considered as commercial land use. These activities include the buying and selling of goods and services in retail businesses, wholesale buying and selling, financial establishments, and wide variety of services that are broadly classified as "business". Even though these commercial activities use only a small amount of land, they are extremely important to a community's economy. Commercial land includes established markets and areas earmarked for markets.	16.98	1.76
5	Community Facilities	All community facilities including funeral places and other religious uses	11.06	1.15
6	Education & Research	All kinds of educational institutes like Primary/secondary/other Schools/ Colleges etc are mentioned to calculate the land use for education and research purpose.	16.27	1.69
7	Health Facility	Health Facilities include Upazila Hospital, Health Center, Maternity Clinic, Clinic etc.	6.69	0.70
8	General Industry Zone	Green and Orange A categories as per The Environment Conservation Rules, 1997	21.19	2.20
9	Mixed Use	Mixed land use refers to the area without dominant land use (Residential, commercial, industrial etc.).	10.77	1.12
10	Open Space	Playground, Botanical Garden, Stadium, Zoo etc. (Facilities without or with minimum building structure)	50.23	5.22
11	Recreational	Facilities other than those mentioned to Open Space	0.36	0.04

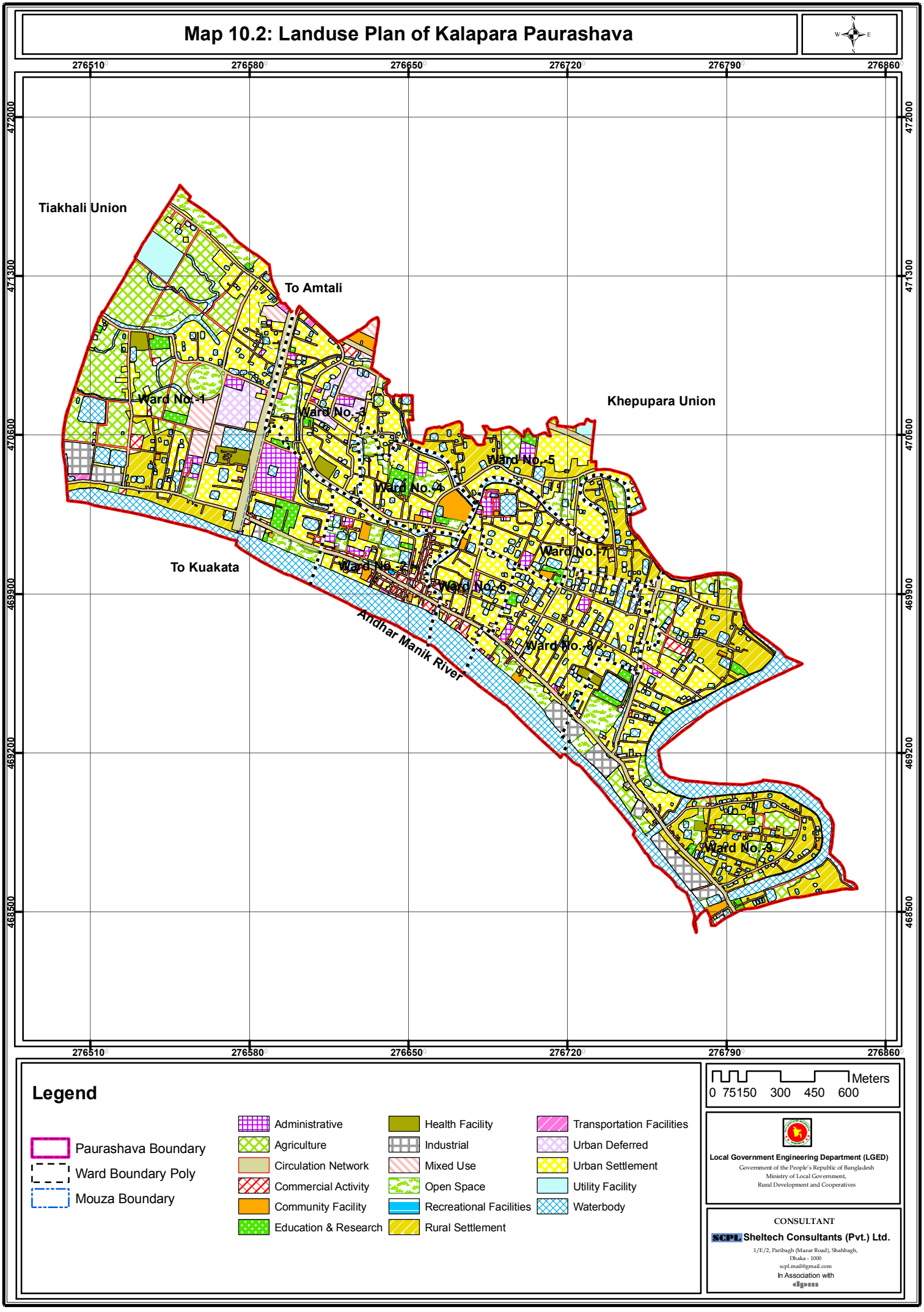
Sl. No.	Land use Category	Remarks	Area (Acre)	%
	Facility	and indoor based facilities with designated building structure i.e. Cinema Hall, Theater Hall etc.		
12	Restricted Area	A Restricted Area is an area where no one but certain people can enter. Here the areas which are not accessible for the general public except some high ranked personnel are considered as restricted area.	-	-
13	Rural Settlement	Rural settlement includes the low dense residential area which is scattered and rural in nature. It may permit only low density uses. Aiming to control the growth in this zone, less service and facilities will be provided.	91.28	9.48
14	Transport Facilities	Under transport and communication land use both transport and communication services are considered. This category includes airport, bus terminal/ stand, ferry ghat, filling station, garage, launch terminal, post office, passenger shed, telephone exchange, ticket counter, transport office etc.	5.34	0.55
15	Urban Deferred	Optional depending on the Paurashava and the Consultant's judgment	15.56	1.62
16	Urban Residential	Urban Residential area is a land use in which housing predominates. These include single family housing, multi-family residential, or mobile homes. Zoning for residential use may permit some services or work opportunities or may totally exclude business and industry. It may permit high density land use	254.61	26.46
17	Utility Services	Utility services include Overhead Tank, Power Office/Control Room, Public Toilet, Sewerage Office, Waste Disposal ,Fire Service, Water Pump House ,Water Reservoir, Water Treatment Plant etc.	8.97	0.93
18	Overlay Zone	If the consultant justify any area that should not be defined as other given definitions but the facility(s) may not be avoidable, they may use this category	Not applicable	-
19	Forest	Forest Designated Forest Area	Not applicable	-
20	Beach	Sea Beach	Not applicable	-
21	Miscellaneous (Vacant Land)	Any other categories which are not related to above 23 categories.		
22	Historical and Heritage Site	The entire mentionable historical and heritage site.	Not applicable	-
23	Water Body	Equal or More than 0.25 acre and justification by the consultant and wet land will merge with water body	195.34	20.30
Total			**962.43**	**100.00**

Source: Consultants Estimation

Map 10.1: Existing Landuse of Kalapara Paurashava



Map 10.2: Landuse Plan of Kalapara Paurashava



Legend

- Paurashava Boundary
- Ward Boundary Poly
- Mouza Boundary

- Administrative
- Agriculture
- Circulation Network
- Commercial Activity
- Community Facility
- Education & Research
- Health Facility
- Industrial
- Mixed Use
- Open Space
- Recreational Facilities
- Rural Settlement
- Transportation Facilities
- Urban Deferred
- Urban Settlement
- Utility Facility
- Waterbody

0 75150 300 450 600 Meters

Local Government Engineering Department (LGED)
Government of the People's Republic of Bangladesh
Ministry of Local Government,
Rural Development and Cooperatives

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In Association with

Table 10.3: Land Requirement, Existing and Proposed Land use of Kalapara Paurashava for the Year 2031

Sl. No	Landuse Categories	Types of Landuses	Recommended Standard	Projected Required Land for 2031(Acre)	Existing Land (Acre)	Deficiency/Surplus (Acre)	Actual Proposed Land (acre)
1	Residential	General residential	100 – 150 persons/1 acre	239.02	398.57	-159.55	
		Real Estate – Public/Private	200 population/ 1 acre				10.14
		Total		**239.02**	**398.5**	**-159.55**	**10.14**
2	Education and Research	Nursery	0.5 acre/10,000 population	1.20			
		Primary School/ kindergarten	2.00 acres/5000 population	9.56			
		Secondary/High School	5.00 acres /20,000 population	5.98			
		College	10.00 acres/20,000 population	11.95			
		Vocational Training Centre	5 - 10 acres / Upazila	5.00			
		Other	5.00 acres / 20,000 population	0			
		Total		**33.69**	**13.31**	**20.38**	**2.93**
3	Open Space	Play field/ground	3.00 acres/20,000 population	3.59			
		Park	1.00 acre /1000 population	23.90			
		Neighborhood park	1.00 acre /1000 population	23.90			
		Stadium/sports complex	5 – 10 acres/ Upazila HQ	6.00			
		Total		**57.39**	**47.97**	**9.42**	**13.67**
4	Recreational Facility	Cinema/ Theatre	1.0 acre /20,000 population	1.20			
		Total		**1.20**	**0.38**	**0.82**	**0**
5	Health Service	Upazila health complex/ hospital	10 -20 acres/ Upazila HQ	10			
		health centre/Maternity clinic	1.00 acre/ 5,000 population	4.78			
		Total		**14.78**	**2.02**	**12.76**	**4.45**
6	Community Facilities	Mosque/Church/Temple	0.5 acre /20,000 population	0.60			
		Eidgah	1.0 acre/20,000 population	1.20			
		Graveyard	1.00 acre /20,000 population	1.20			
		Community centre	1 acre /20,000 population	1.20			
		Police Station	3 – 5 acres/Upazila HQ	3.00			
		Police Box/outpost	0.5 acre/ per box	0.5			
		Fire Service	1.00 acre/20,000 population	1.20			
		Post office	0.5 acre /20,000 population	0.60			
		Total		**9.50**	**10.26**	**-0.76**	**6.67**
7	Commercial	Wholesale market	1.0 acres/ 10000 population	2.39			
		Retail sale market	1.0 acres/ 1000 population	23.90			
		Corner shops	0.25 acre/per corner shop	0.50			
		Neighborhood market	1.00 acre/per neighborhood market	1.00			
		Super Market	1.50 – 2.50 acres/per super market	2.00			
		Total		**29.79**	**22.08**	**7.71**	**3.32**

Sl. No	Landuse Categories	Types of Landuses	Recommended Standard	Projected Required Land for 2031(Acre)	Existing Land (Acre)	Deficiency/Surplus (Acre)	Actual Proposed Land (acre)
8	Utility Services	Water supply	1.00 acre /20,000 population	1.20			
		Gas	1.00 acre /20,000 population	1.20			
		Solid waste disposal site	4-10 acres/Upazila HQ	5.00			
		Waste transfer station (9 nos)	0.25 acres/per waste transfer station	2.25			
		Electric Sub station	1.00 acre /20,000 population	1.20			
		Telephone exchange	0.5 acre/20,000 population	0.60			
		Water Treatment Plant	1.00 acre/20,000 population	1.20			
		Total		**12.65**	**0**	**12.65**	**8.67**
9	Industrial	Small scale	1.00 acre/1,000 population	23.90			
		cottage/agro-based	1.00 acre/1,000 population	23.90			
		Total		**47.80**	**16.72**	**31.08**	**5.30**
10	Transportation Facilities	Bus terminal	1.0 acre /20,000 population	1.20			
		Truck terminal	0.50 acre /20,000 population	0.60			
		Launch/steamer terminal	1.00 acre /20,000 population	1.20			
		Railway station	4.00 acre / per Station	0			
		Baby taxi/tempo stand	0.25 acre /one baby taxi/tempo stand	0.50			
		Rickshaw/van stand	0.25 acre /one baby taxi/tempo stand	0.50			
		Passenger Shed	0.25 acre /one baby taxi/tempo stand	0.25			
		Fuel Station	0.5 acre/20,000 population	0.60			
		Total		**4.85**	**0.78**	**4.07**	**4.93**
11	Administrative	Upazila complex	10-15.00 acres	10.00			
		Paurashava office/Ward Councilor's Office	3 – 5 acres	5.00			
		Jail/Sub-Jail	10 acres/Upazila HQ	10.00			
		Total		**25.00**	**17.21**	**7.79**	**6.72**
12	Circulation Networks	Paurashava primary roads	150 – 100 feet				
		Paurashava secondary roads	100 – 60 feet				
		Paurashava local roads	40 - 20 feet				
		Total			**30.82**		**126.20**
13	Agriculture	Agri-extension Farm	10 acres/Upazila HQ	10	196.45		
		Total		**10**	**178.33**	**-168.33**	
14	Urban Deferred	Urban Deferred	10 percent of the total build up area	9.95	0	9.95	15.56
		Total		**9.95**	**0**	**9.95**	**15.56**

Source: The Consultants' Estimation

* Here – indicates surplus of land, * indicates estimated by the consultants

A) Residential Zone

Residential zone refers to all categories of urban residential areas, including exiting ones and the residential land use proposed under the present Master Plan. Here, residential zone comprises urban residential area. In order to accommodate the projected urban resident population (100 person/1 acre according to planning standard) in the study area, around 239.02 acres of land would be required up to the year 2031. On the other hand, 398.57 acres of land have already existed as residential plots in the Kalapara area. In 1931 the gross density of this Paurashava will be 23.30 persons/acre and net residential density will be 69.10 persons/acre which allow the planning standard. This zone will allow commercial uses as listed in **Table-A.1, ANNEX-C**, and conditional uses as listed in **Table-A.2, ANNEX-C.** There is surplus of urban residential land of 159.55 acre.

As a coastal town Kalapara Paurashava is more vulnerable due to cyclone and storm surge. So, there will be need some designated land for low income and resettled people in near future. For this purpose 10.14 acres of land is proposed for resettlement zone and low income housing. This proposal is shown in Map 10.2 and Table 10.4:

Table 10.4: Development Proposal for Residential Zone

ID	Type of Facility	Ward No	Mouza	Plot No	Area (acre)
DP-48	Low Income Housing	9	Badurtali	816,913-16,985-86	2.50
DP-23	Resettlement Zone	5	Khepupara	499,500-12,514	7.64
Total					**10.14**

B) Rural Settlement

Rural settlement includes the low dense residential area which is scattered and rural in nature. It may permit 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. This zone has an area of 91.28 acres (9.66% of the existing Paurashava area) designated up to 2031. This zone will allow rural residential uses as listed in **Table-A.7, ANNEX-C**, and conditional uses as listed in **Table-A.8, ANNEX-C.**

C) Commercial Zone

The commercial zone is intended to provide locations, where commercial activities including retails and wholesale can be set up and function without creating hazards to surrounding land uses. In order to accommodate the commercial land in the year 2031, about 29.79 acre more land will be required. On the other hand, 22.08 acres of land have already existed as commercial plots in the Kalapara area. This zone will allow commercial uses as listed in **Table-A.5, ANNEX-C**, and conditional uses as listed in **Table-A.6, ANNEX-C**. Table 10.5 shows the distribution of commercial land in the study area.

Table 10.5: Development Proposal for Commercial Zone

ID	Type of facility	Ward no	Mouza Name	Plot No	Area (Acre)	Phase-wise development		
						1st Phase (1st to 5th year)	2nd Phase (6th to 10th year)	3rd Phase 11th to last 10 year)
DP-49	Shopping Complex	2	Khepupara	612,632-37,653,655	0.43	Land Acquisition	Establish and development	
DP-47	Wholesale Market	3	Khepupara	402-404	0.75	Land Acquisition	Establish and development	
NM_01	Neighborhood Market	1	Khepupara	191-192, 213, 292	0.81	Land Acquisition	Establish and development	
NM_09		9	Badurtali	617, 641-42, 644	1.18			
				Total	**3.17**			

D) Industrial Zone

Kalapara Paurashava is basically an island. Small business, agriculture and fishing are the main base of the economy of the area. The plan needs to accommodate such industries those have growth potentiality related to the base of economy of Kalapara Paurashava. Due to the environmental and ecological condition, the plan discourages growth of heavy industries in the planning area. The plan segregated industries generally in to two classes; (I) General Industrial Zone in where processing units, small scale and harmless medium scale industries can be placed and, (II) Heavy industries in where all type of medium, heavy and toxic industries can be placed. In this zone a complex line of industrial and supporting non-industrial land uses will be permitted as per **Table-A.3, ANNEX-C** and conditional permission will be given to a number of other land uses as specified on **Table-A.4, ANNEX-C**. To allow industrial set up in the demarcated zone of Kalapara, the plan will follow two norms:

I) For categorizing, allocating land and providing guideline to set up industries, the plan will strictly follow the "The Environment Conservation Rule, 1997".

II) For allocating land to set up industries, the plan will prioritize environmental & ecological condition and base of the economy of Kalapara Paurashava.

About 5.30 acres of land is proposed for industrial set up in Kalapara Paurashava.

Table 10.6: Development Proposal for Industrial Zone

ID	Type of facility	Ward no	Mouza Name	Plot No	Area (Acre)	Phase-wise development		
						1st Phase (1st to 5th year)	2nd Phase (6th to 10th year)	3rd Phase 11th to last 10 year)
DP-06	Industrial Zone	1	Khepupara	208,213, 217	5.27	Land acquisition	Development Infrastructure	

E) Agricultural Zone

Agricultural zone denotes the land suitable for agricultural production, both crops and livestock. It is one of the main resources in agriculture. Out of the total area of Kalapara Paurashava, 93.71 acres need to preserve from unplanned development to fulfill objectives sited in various national policies along with the Master Plan. Agricultural zone covers activities related to agriculture and agriculture related production activities; farm, fisheries, pasture, horticulture etc. Details of land uses are presented in **Table-A.17, ANNEX-C** and conditional uses as listed in **Table-A.18, ANNEX-C**.

F) Administrative

Government Office refers such areas encompass accommodation of the offices of various government authorities along with semi-government and autonomous bodies. A few number of private bodies formed especially for public services can also be accommodated in this zone.

According to the projection, about 23.08 acres land will be required for this purpose to meet the administrative demand of projected people in the year of 2031 whereas at present 17.21 acre land is used for government office purpose. In case of Paurashava Office/Ward Councilor's Office 3 to 5 acres of land will have to be proposed respectively based on the standard, whereas at present only around 1 acre of land has been acquired by the government for construction of this offices at Kalapara Paurashava. Moreover, the surrounding areas of the designated space are already developed and according to the consultation on master plan, the authority are not interested to change their space for this purposes and also they do not feel that more land will be required for this purposes. If Paurashava authority wants to shift their office, they can establish Paurashava Office in the areas proposed for other government offices (there already available land exists). It is expected that in near future the authority will expand Paurashava area to meet its standard requirements. Other uses have been proposed in accordance with the standards. The permitted uses in this zone are presented in **Table-A.15**, **ANNEX-C** and conditional uses as listed in **Table-A.16**, **ANNEX-C**. Table 10.7 reveals the distribution of proposed land of government offices at Kalapara Paurashava.

Table 10.7: Development Proposal for Government Services

	Type of facility	Ward no	Mouza Name	Plot No	Area (Acre)	Phase-wise development		
						1st Phase (1st to 5th year)	2nd Phase (6th to 10th year)	3rd Phase 11th to last 10 year)
DP-29	Ward Center	1	Khepupara	179	0.97	Land acquisition	Development Infrastructure	
DP-31		2	Khepupara	636-37,401	0.51			
DP-30		3	Khepupara	638	0.75			
DP-32		4	Khepupara	844-46	0.71			
DP-33		5	Khepupara	460,514	1.35			
DP-35		6	Khepupara	958-60,986	0.42			
DP-34		7	Khepupara	961	0.74			
DP-36		8	Khepupara	1019,1022-23,1060	0.73			
DP-37		9	Badurtali	652	0.50			
				Total	**6.68**			

G) Recreational Facilities

There exists a cinema hall in Kalapara Paurashava which is covering only 0.38 acres of land. According to the standard 1.20 acre of land is required for Recreational purpose in the year 2031. In Kalapara Paurashava no land is proposed for recreational purpose.

H) Open Space

Open space includes play field / play ground, park, neighborhood park, Stadium, etc. according to the standard about 50.23 acres of land is required for projected population in the year 2031 where as present 47.97 acres of land is used for this purpose. The details of permitted and conditional permits have been presented in **Table-A.19, ANNEX-C** and conditional uses as listed in **Table-A.20, ANNEX-C**. One Stadium, Children's Park and Parks are provided which are covering almost every ward except ward no. 5 & 6. A number of five Parks are provided which are covering the wards no 1, 3, 5, 7 and 9. Table 10.8 shows the proposed lands to meet up the demand of projected people.

Table 10.8: Development Proposal for Open Spaces

ID	Type of facility	Ward no	Mouza Name	Plot No	Area (Acre)	Phase-wise development		
						1st Phase (1st to 5th year)	2nd Phase (6th to 10th year)	3rd Phase 11th to last 10 year)
DP-26	Sishu Park	2	Khepupara	612,644,646	0.97	Land acquisition	Development Infrastructure	
DP-20	Stadium	1	Khepupara	179,182,185	4.14	Land acquisition	Development Infrastructure	
DP-07	Playground	9	Badurtali		4.53	Land acquisition	Development Infrastructure	
DP-14	Park	1	Khepupara	154-56,276	2.21	Land acquisition	Development Infrastructure	
DP-15		3	Khepupara	352-53	2.38			
DP-16		5	Khepupara	461,475-82, 503-04	1.09			
DP-13		7	Khepupara	1012	1.15			
DP-17		9	Badurtali	608,613-14	1.73			
				Total	**18.20**			

I) Health Facilities

Health Facilities includes Upazila Health complex, health center or maternity clinic. Considering projected population in the year 2031, about 6.69 acres of land will be required for various Health

facilities whereas only 2.02 acre land is used in recent. To accommodate unanticipated spatial requirement of Health facilities about 4.45 acres of land is proposed in the master plan. This zone will allow some uses as listed in **Table-A.9**, **ANNEX-C**, and conditional uses as listed in **Table-A.10**, **ANNEX-C**. Table 10.9 shows the proposed lands to meet up the demand of projected people.

Table 10.9: Development Proposal for Health Facilities

	Type of facility	Ward no	Mouza Name	Plot no	Area (Acre)	Phase-wise development		
						1st Phase (1st to 5th year)	2nd Phase (6th to 10th year)	3rd Phase 11th to last 10 year)
DP-11	Clinic	1	Khepupara	168, 172	1.43	Land acquisition	Development Infrastructure	
DP-09		3	Khepupara	381-383, 385	1.38			
DP-10		8	Khepupara	1032-33, 1035-36, 1041	1.03			
			Badurtali	682				
DP-21		9	Badurtali	721-723	0.61			
				Total	**4.45**			

J) Community Facilities

Community Facilities includes Masjid/Temple/Church, Eidgah, Community Center and Graveyard. Considering projected population in the year 2031, about 9.50 acres of land will be required for various Community Facilities whereas 10.26 acre land is used in recent. To accommodate spatial requirement of Community Facilities about 6.67 acres of land is proposed in the master plan. Table 10.10 shows the proposed lands to meet up the demand of projected people.

Table 10.10: Development Proposal for Community Facilities

ID	Type of facility	Ward No.	Mouza Name	Plot no	Area (Acre)	Phase-wise development		
						1st Phase (1st to 5th year)	2nd Phase (6th to 10th year)	3rd Phase 11th to last 10 year)
DP-08	Auditorium	2	khepupara	612,641-42,644	0.76	Land acquisition	Development Infrastructure	
DP-52	Eidgah	2	Khepupara	654-55,658-59	0.54	Land acquisition	Development Infrastructure	
DP-05	Graveyard	4	Khepupara	849-52,865-67,888	3.48	Land acquisition	Development Infrastructure	
DP-12	Proposed Cyclone Shelter	3	Khepupara		1.39	Land acquisition	Development Infrastructure	
DP-25	Shamshan Ghat	8	Khepupara	937,9940-43,1106-07	0.43	Land acquisition	Development Infrastructure	
SM_04	Shaheed Minar	4	Khepupara	833	0.49	Land acquisition	Development Infrastructure	
				Total	**7.09**			

K) Education and Research Zone

Educational & Research zone refers to mainly education & research and other social service facilities as listed in **Table-A.13, ANNEX-C,** and conditional uses as listed in **Table-A.14, ANNEX-C**. Educational zone refers all kind of educational set up; School, Colleges, Madrasha and even such institutions operated for education like; training institutions, research institutions etc. In order to meet up the demand of projected population (2031), about 33.69 acre lands will be required. In the proposal 2.93 acres of land is given for educational purpose. There are total 14 number of educational institutions including 06 primary school, 02 kindergarten, 03 high school, 02 colleges and one madrasa are exist almost every ward of this Paurashava. But these existing institutions

are occupied only 13.31 acres. Therefore extra 02 primary schools and one high school are proposed in the Paurashava area. Number of educational institutions is enough in this planning area. It is highly recommended to vertical expansion of these educational institutions due scarcity of land and effect of flood and tidal surge. Table 10.11 presents the distribution of proposed land under education and research institutions.

Table 10.11: Development Proposal for Education and Research Zone

ID	Type of facility	Ward no	Mouza Name	Plot No	Area (Acre)	Phase-wise development		
						1st Phase (1st to 5th year)	2nd Phase (6th to 10th year)	3rd Phase 11th to last 10 year)
DP-53	Primary School cum Cyclone Shelter	1	Khepupara	185, 190-191, 292	1.02		Land acquisition and development all facilities	
DP-18		5	Khepupara	460, 514-516	0.76		Land acquisition and development all facilities	
DP-19	Secondary School cum Cyclone Shelter	1	Khepupara	165-168, 304	1.15		Land acquisition and development all facilities	
				Total	**2.93**			

L) Water Body

Water body contains all natural streams; canals, irrigation canal, depressions like; beel, wetland, low laying areas and ponds. No standard is being prescribed for water body from the UTIDP. The Paurashava is rural-based urban area. In the proposal about 195.34 acres of water body are being preserved though existing total water body is 203.86 acres. These waterbodies have been preserved under the 'Playfield, Open Space, Park and Natural Water Reservoir Conservation Act, 2000'. The Planning Schedule of Waterbodies in Kalapara Paurashava is shown in Annexure G. The rests of the lands have been used to meet up the requirements of other facilities at Paurashava. Water courses are the water flow paths or the existing natural water courses that carry storm water and waste water. These are the existing khals. These facilities should not be allowed to such that endanger their existence and use. In order to preserve them and keep them functional only the uses as suggested in **Table-A.21, ANNEX-C** will be permitted. Some other uses will be permitted on conditions as suggested in the list put in Table**-A.22, ANNEX-C**.

M) Circulation Network

Circulation Network refers all kind of public roads along with related facilities; footpaths, walkways etc. and embankment. According to the Traffic and Transportation Management Plan, about 141.88 acres of land have been proposed for circulation network at Kalapara Paurashava area whereas at present only 30.82 acre land has been used for these purposes.

N) Transportation Facilities

Transportation facilities include Bus/Truck Terminals, Launch Terminal, Other Vehicle Parking Space, Gas/ Fuel Station, etc. Considering projected population in the year 2031, about 4.85 acres of land will be required for various transportation and communication facilities whereas 0.78 acre of land is used in recent. To accommodate unanticipated spatial requirement of transportation and communication sectors about 4.93 acres of land is proposed in the master plan including various facilities such as bus terminal which will be situated outer side of the Paurashava, truck terminal and other vehicle parking, etc. Table 10.12 shows the proposed lands to meet up the demand of projected people.

Table 10.12: Development Proposal for Transportation Facilities

ID	Type of facility	Ward no	Mouza Name	Plot No	Area (Acre)	Phase-wise development		
						1st Phase (1st to 5th year)	2nd Phase (6th to 10th year)	3rd Phase 11th to last 10 year)
DP-54	Bus Terminal	Extended Area	Khepupara	332,330,329,334,335	3.09	Land acquisition	Development Infrastructure	
DP-28	Truck Terminal	1	Khepupara	208, 213	1.01	Land acquisition	Development Infrastructure	
DP-24	Rickshaw Stand	3	Khepupara	360,362	0.31	Land acquisition	Development all facilities	
DP-04	Fuel Station	3	Khepupara	347,346,350,351,352	0.19	Land acquisition	Development all facilities	
DP-27	Tempo Stand	1	Khepupara	335,337	0.34	Land acquisition	Development all facilities	
				Total	**4.94**			

O) Utility Service

Utility Service includes Solid waste disposal site, waste transfer station, Water Treatment Plant and fire service. Considering projected population in the year 2031, about 12.65 acres of land will be required for various Utility Services whereas no land is used in recent. To accommodate unanticipated spatial requirement of Utility Services about 8.97 acres of land is proposed in the master plan. Table 10.11 shows the proposed lands to meet up the demand of projected people.

Table 10.13: Development Proposal for Utility Services

ID	Type of facility	Ward no	Mouza Name	Plot No	Area (Acre)	Phase-wise development		
						1st Phase (1st to 5th year)	2nd Phase (6th to 10th year)	3rd Phase 11th to last 10 year)
DP-02	Waste Disposal Site	1	Khepupara	133-36,149, 152-53, 282	6.33		Land acquisition and development all facilities	
DP-03	Electric Sub-Station	5	Khepupara	499, 501-502	1.22		Land acquisition and development all facilities	
DP-22	Pump House	2	Khepupara		0.11			
DP-38	Waste Transfer Station	1	Khepupara	179,268	0.08		Land acquisition and development all facilities	
DP-39		2	Khepupara	612,639	0.06			
DP-40		3	Khepupara	401	0.15			
DP-41		4	Khepupara	838,842	0.11			
DP-46		5	Khepupara	473-74	0.07			
DP-44		6	Khepupara	986	0.24			
DP-43		7	Khepupara	949	0.20			
DP-42		8	Khepupara	1027-1028	0.06			
DP-45		9	Badurtali	671-72	0.17			
				Total	**8.80**			

P) Mixed Use Zone

Mixed use zones have been recommended to allow some flexibility in development. In a small town like Kalapara, as the trend shows, an exclusive commercial land use is unlikely to function. Admixture of land uses will allow flexibility of development, instead of restricting development. Total area for mixed uses has earmarked to 10.77 acres (1.14% of the total area). This zone will allow residential structures together with commercial uses as listed in **Table-A.11, ANNEX-C**, and conditional uses as listed in **Table-A.12, ANNEX-C**.

P) Urban Deferred

Urban deferred area includes potential land reserved for future use. Standard shows 10% of total build up land should be used as Urban Deferred area. According to it, 15.56 acre land has been conserved for this purpose.

10.2 Land Use Zoning

Zoning is a classification of land use 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.

10.2.1 Area / Use Zoning

The objective of area zoning is to specify which types of land use 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.

The zoning is defined as the regulation by law of the use of land and buildings and of the height and density of buildings in specific areas for the purpose of securing convenience, health, safety and general welfare of the community. Thus, the term zoning is used to include two aspects of planning- allocation of land for specific purposes and control of the use, height and construction of the buildings.

Though the future land requirements are the first priority of planning for a city but considering the existing land use there should be provision of zoning. The zoning will demarcate specific land use for a specific zone or area. The zones are usually classified into the following four categories with suitable sub-divisions in each zone:

a. **Residential zone:** the character and location of this zone will depend on various factors such as nearness to the markets; freedom from nuisance, noise and smoke; nearness to parks and playgrounds etc.
b. **Commercial zone:** this zone should be near the centers of traffic and preferably it should about the roads. It includes the uses of land for banks, offices, godowns, shops etc.
c. **Industrial zone:** great care should be exercised in providing units of industrial zone in various part of the town. The light industries and factories running on electric power and causing no nuisance to nearby areas may be allowed to be set close to residential areas. On the other hand, the heavy industries giving out obnoxious gases and fumes and developing noisy atmosphere may be placed on the outskirts of the town.
d. **Recreational zone:** This zone includes mainly parks and playgrounds and in a broad sense, it may be considered to include various recreational centers such as cinemas, theatres, town halls, clubs, libraries, restaurants, stadium and other community needs.

Besides these any special land use can get special emphasis on the basis of its intensity, significance on local, national economy etc.

10.2.2 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 land use table is the only tool to control building density in the Paurashava.

10.2.3 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 land use 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.

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 Plan Implementation Strategy

10.3.1 Land Development Regulations to Implement the Land Use 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 land use plan proposals.

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

provision prescribed in the plan. Any permission for building construction, front road width shall not be less than 16 ft. and the construction must follow the Building Construction (Amendment) Rules, 1996.

3. Haphazard development of commercial activities is the general scenario of the Paurashava. It is necessary to impose control on commercial activities provisioned in the Shops and Establishments Act, 1965 (Act No. VII of 1965).
4. In case of man-made canal, regulations prescribed in the Canal and Drainage Act, 1873 (Act No. VIII of 1873) is the best weapon. For the linking of canal with others and river considering drainage facilities the Act may be enforced.
5. For the conservation of archeological monuments or structures or historical development the Ancient Monuments Preservation Act, 1904 (Act No. VII of 1904) may be enforced. Archeological Department of Bangladesh and Paurashava authority through a partnership process may preserve such type of development.
6. To control air pollution due to brick burning with the establishment of brick field, Brick Burning Control Ordinance, 1989 (Ordinance No. VIII of 1989) is the appropriate regulation. The Paurashava authority may enforce this Ordinance with the authorization given by the government to him.
7. To control the medical practitioner, establishment of private clinics and pathological laboratories, the statute named Medical Practice, Private Clinics and Laboratories (Regulation) Ordinance, 1982 (Ordinance No. IV of 1982) was enacted. For efficient enforcement of the Ordinance, the Paurashava authority may execute the Ordinance with the authorization of government.
8. The Paurashava will have to exercise strictly Playfield, Open space, Garden and Natural Tank in Urban Areas Preservation Act, 2000 (Act No. XXXVI of 2000) to some specially important areas like, riverfront and water bodies, drainage channels, low land below certain level, designated open space, etc. Development restrictions are needed around security and key point installations. The provision of restriction will strengthen the power of the plan to safeguard its development proposals and land use provisions.
9. The government is authorized for establishment of hat and bazar with the acquisition of land through the statute named Hat and Bazar (Establishment and Acquisition) Ordinance, 1959 (No. XIX of 1959). In case of private hat and bazar, a management body is being empowered through the Bangladesh Hats and Bazars (Management) Order, 1973 (P.O. 73/72). The 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.
10. In the Paurashava premises, industrial development is controlled by the Bangladesh Cottage Industries Corporation through Bangladesh Cottage Industries Corporation Act, 1973 (Act No. XXVIII of 1973), Industrial Development Corporation through East Pakistan Industrial Development Corporation Rules, 1965 (No. EPIDC / 2A-2/63/354) and Factory Inspector through Factories Act, 1965 (Act No. IV of 1965). Locational aspects and issuing of trade license is controlled by the Paurashava authority. A joint coordination cell among those four authorities may control the establishment of factories and industries in the Paurashava.
11. In the Paurashava, for rain water harvesting, some specific ponds/tanks will needed to be preserved. A number of derelict tanks may be improved through tank improvement project and in this case Tanks Improvement Act, 1939 (Act No. XV of 1939) will support the Paurashava is regulatory aspects.
12. Except Khas land, a considerable amount of public land in the Paurashava may be identified as fallow land or unproductive land. In regulatory term those lands are considered as cultivable waste land and those lands are being fallow during five consecutive years. Those lands may be utilized under the guidance of Cultivable Waste Land (Utilization) Ordinance, 1959 (Ordinance No. E.P. XIII of 1959).

13. 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.

10.3.2 Implementation, Monitoring and Evaluation of the Land Use Plan

Implementation through Multi-Sectoral Investment Program: 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 Land use 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: Land use zoning is one of several methods of plan implementation to be considered. In all cases where some form of development, land use control may be applied; careful consideration requires the following ideologies:

- 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 Land use 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 layout 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 Land use 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 Land use 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 Land use Plan be made a legal requirement.

For implementation of the various program components of the Land use 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 ongoing and implemented projects is essential to keep the future course of action on the right track. An ongoing 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 land use management issues and application procedures for the submission of development applications.
- Enforce planning and land use management related legislation and zoning scheme regulations.
- Issue of property zoning certificates.
- Investigate and resolve land use management complaints, illegal land use 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

Transportation occupies a high place in modern life. Transportation has great influence in the advancement of all spheres of life. Transport planning is a science that seeks to study the problems that arise in providing transportation facilities in an urban, regional or national setting and to prepare a systematic basis for planning such facilities. Town and country planning is a science that deals with the study of the urban or country “system” communications through channels. Transport planning is an important part of overall Town and Country Planning, since it deals with the transport network which is an important channel of a communication. Transportation and Traffic Management Plan is one of the Components of Urban Area Plan.

In Bangladesh, Transport Planning is not in practice still. Recently, government has developed the National Land Transport Policy, 2004 in order to provide a safe, integrated, effective transport system. Also, attempt has been taken to link relationship with land, economic activities and road network development. In preparing the Traffic and Transport Management Plan (Component-2) for Kalapara Paurashava under Urban Area Plan (Part B), the Survey Phase and Interim phase has been completed successfully. In precedence of these activities, this plan is incepted.

11.2 Approach and Methodology

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

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

Traffic volume survey has been conducted to find out the scenario of average daily traffic, peak hour traffic and off-peak hour traffic. Origin-Destination survey has been carried out to know the pattern of traffic generation, traffic distribution, modal split etc. Speed and delay survey has been conducted at 2 points on major local roads.

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

11.3 Existing Conditions of Transportation Facilities

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

11.3.1 Existing Road Network

11.3.1.1 Roadway Characteristics and Functional Classification

The primary roads are the urban highways whose function is to channelize the longer movement from one place to another and beyond. The primary road of Kalapara Paurashava is connected in north to South directions and these roads maintain connectivity with the outside areas of Paurashava. Moreover, the primary roads are also connected with secondary and access roads and all these roads maintain good connectivity within the Paurashava area. Secondary road cannot provide access to individual buildings because the consequent frequency of interruptions would give rise to traffic dangers. Tertiary road connect secondary road with access road. But in Kalapara Paurashava most of the roads cannot be defined according to road hierarchy.

From the physical feature survey it has been observed that about 54.74% (29.12 km) of the roads are Pucca, 13.18% (7.01 km) roads Kutcha and the rest of the roads are Semi-pucca 32.09% (17.07 km). There are 6 bridges at Kalapara Paurashava. Few bridges are pucca and condition of pavement are good and the rests of them are wooden. There are 14 box culverts with 6 pipe culverts exist at Kalapara Paurashava. **Map 11.1** shows existing road network of Kalapara Paurashava.

Table 11.1: Type Wise Length and Area of Existing Road

Types of road	Length (in km)	%
Kutcha Road	7.01	13.18
Pucca Road	29.12	54.74
Semi pucca Road	17.07	32.09
Total	**53.20**	**100.00**

Source: Physical Feature Survey, 2013

Traffic volume survey has been conducted at two major intersections comprising seven roads (Patuakhali to Ferry ghat, Kuakata to Ferry ghat, Wapda to Ferry Ghat, Sluice gate to Ferry Ghat, Natun Bazar Road, Girls College Road, Hospital Road) links that are the dominant traffic generating links of Paurashava Area. Beside this about 39.60 km access roads provide access to all the wards. Width of access road varies 1-4.5 m. Mainly LGED is responsible for construction and maintenance of most of the roads within the Paurashava

11.3.1.2 Mode of Road Transport

There is no public or private bus service available for intra-zonal movement within Kalapara Paurashava. Intra-zonal movement among the Paurashava area is mostly done through the non-motorized vehicles such as rickshaw, bi-cycle, van, etc. Additionally, people also use some motorized vehicles such as motorcycle, Auto Rickshaw, etc. Rickshaw is the most dominant transport for intra zonal movement. The average percentages of traffic composition at these seven locations are Truck 4.9%, Bus 8.0%, Car/micro-bus 7.2%, Auto rickshaw 6.2%, Motor cycle 10.4%, Rickshaw/van 43.5%, Bi-cycle 16.6% and others (Tomtom) 3.1%.

11.3.1.3 Intensity of Traffic Volume

Traffic volume survey has been conducted to find out total discharging traffic volume both in peak hour and off peak hour at there is one bus stand in Kalapara Paurashava.
Peak Hour has been considered from 8.00 to 13.00 and 15.00 to 21.00 because most of the educational and commercial movement has been accomplished within the time periods and traffic characteristics of these time periods is different and higher than other time periods.

As there is a designated day as hat day in Kalapara Paurashava, working day, weekend and Hat day traffic volume is counted for transportation survey. Survey result shows that non-motorized vehicle (60.1%) acts dominant role in Kalapara Paurashava.

Figure 11.1 shows that Mahila College Road has the highest Peak Hour Traffic Volume of 393.5 PCUs per hour whereas WAPDA to Ferry Ghat Road has the lowest 214.48 PCUs per hour. Sluice Gate to Ferry Ghat Road also has the highest Off Peak Hour Traffic Volume (180.76 PCUs) per hour and WAPDA to Ferry Ghat Road has the lowest Off Peak Hour Traffic Volume (71.6 PCUs) per hour.

Analyzing the characteristics of Peak Hour and Off Peak Hour traffics, it has been observed that the Peak Hour Traffic is more than 2 times higher than Off Peak Hour Traffic in all of the surveyed road sections.

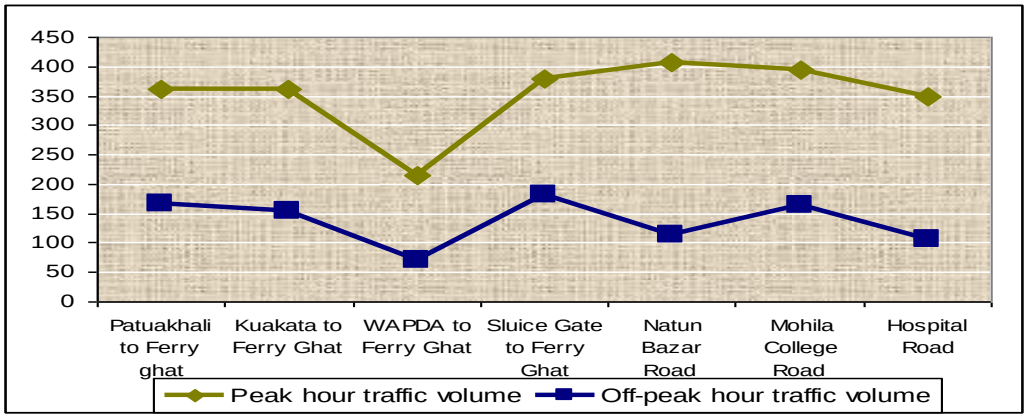


Fig 11.1: Variations of Peak Hour and Off-Peak Hour PCU's

There is also traffic volume variation at hat day and non-hat day. Generally hat time starts from afternoon. So, variation of traffic volume also exists. In case of hat day it has been observed that specially the seven road links that are connected with bazaar area face peak hour traffic volume 8.00-13.00 and 15.00-21.00. Figure 11.2 shows the time wise variation of traffic volume at 7 different survey locations.

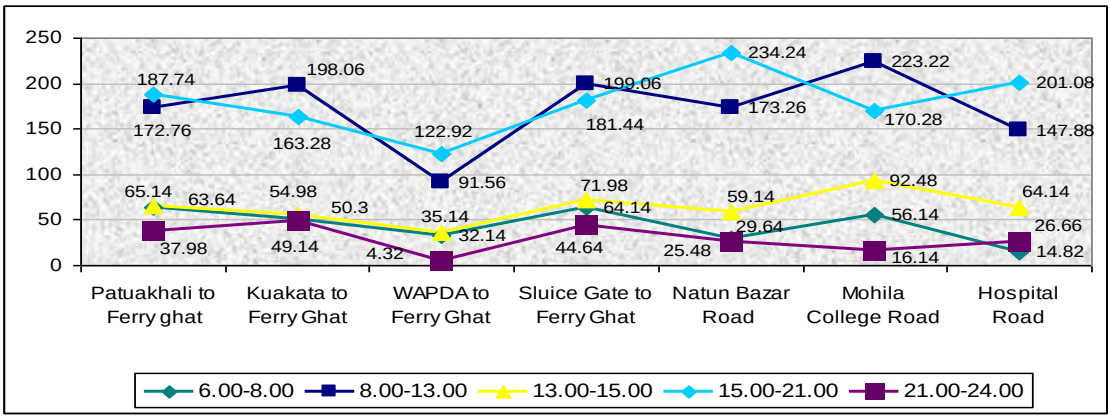


Fig 11.2: Time Wise Distributions of PCUs

11.3.1.4 Level of Service: Degree of Traffic Congestion and Delay

In order to prepare a fruitful traffic management plan, it is really important to evaluate the level of service of the road sections. Level of service of the surveyed road sections has been evaluated using the ratio of volume and capacity. 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. Capacity of roadway largely depends on number of lane,

road width and roadway condition. In Kalapara Paurashava area all the surveyed road sections are one lane road.

In Kalapara Paurashava all the roads have free flow and transport density is low. The major inter sections are not signalized so no delay is exist here.

11.3.1.5 Facilities of Pedestrians

Pedestrian facility is one of the Transportation facilities which are required to create a pedestrian friendly environment. In Kalapara Paurashava, no footpath or pedestrian facility is available for the resident that is one of the vital needs for urban life.

11.3.1.6 Primary Considering Issues for Planning

Major deficiencies of transportation and traffic management are below:

- Present road network has developed without maintaining any hierarchy or planning rules
- Most of the vehicles that move in this Paurashava are without fitness.
- Narrow road and lack of transport modes are another transportation problems of the area
- Absence of stand and proper parking spaces grounds haphazard condition and congestion.
- Absence of signalized crossing.
- Unbalanced relationship between traffic and landuse.
- The Paurashava has no pedestrian facility that directly hampers the safety of the people
- Lack of traffic control aids, street furniture, street lighting, etc.
- Water transport vehicles are not adequate and service quality is not satisfactory

Roadway Capacity Deficiency

Roadway Capacity deficiencies occur wherever the travel demand on a road is close to or higher than the vehicle capacity of that roadway. In order to identify the road capacity deficiency, it is required to make a comparison between existing Level of service (LOS) of major roads with the standard one. By comparing those it has observed that all the surveyed roads of Kalapara Paurashava have free flow and transport density is low. Existing capacity of major roads are not consistent with standard capacity limit and the future traffic flow and demand may exceed the limit.

Moreover, the average width of the primary roads and secondary roads of Kalapara Paurashava are 4 meter and 3.5 meter and 3.75 meter respectively whereas according to the PMO standard the right of way of primary road, secondary road and access road will be 18-24 meter, 13-16 meter and 6-8 meter respectively. So these roads have designed without maintaining any standards. However, these roads have to be widened where possible and essential.

Operational, Safety, Signal and other Deficiencies

- At present, there is no selected authority for the management of traffic at Kalapara Paurashava. Generally The Police Department's Traffic wings are the main eligible.
- As the roads of Kalapara Paurashava have free flow of traffic and most of the traffic are non-motorized both in hat and non-hat day, road safety exists naturally in the Paurashava.
- Traffic signaling system is totally absent in the Paurashava. On some specific point of primary and secondary roads, traffic signaling may be needed.

11.3.2 Condition of Water Transport

Water transport network of Kalapara Paurashava plays very vital role for carrying both passenger and commodity. There are one ferry piers (140 sq.m), one launch terminal (160 sq.m) and three

boat piers (40, 40 and 60 sq.m) at Kalapara Paurashava. The condition of landing stages of terminals is moderate.

11.3.3 Condition of Other Transport

At this stage there is no need to propose car way, rail way in this paurashava. But there is a helipad in this Paurashava which is enough to meet the future need.

11.4 Future Projections

With the increase of population, demand on travel will be increase with the time. Estimating the demand for transportation facilities and services is one of the most important analysis tasks in transportation planning. The demand includes not only passenger travel but also the movement of goods. Whether conducting a regional transportation planning study or examining the impacts of transportation of a new development site, estimating expected travel demand at some future date is critical point of departure for transportation planning.

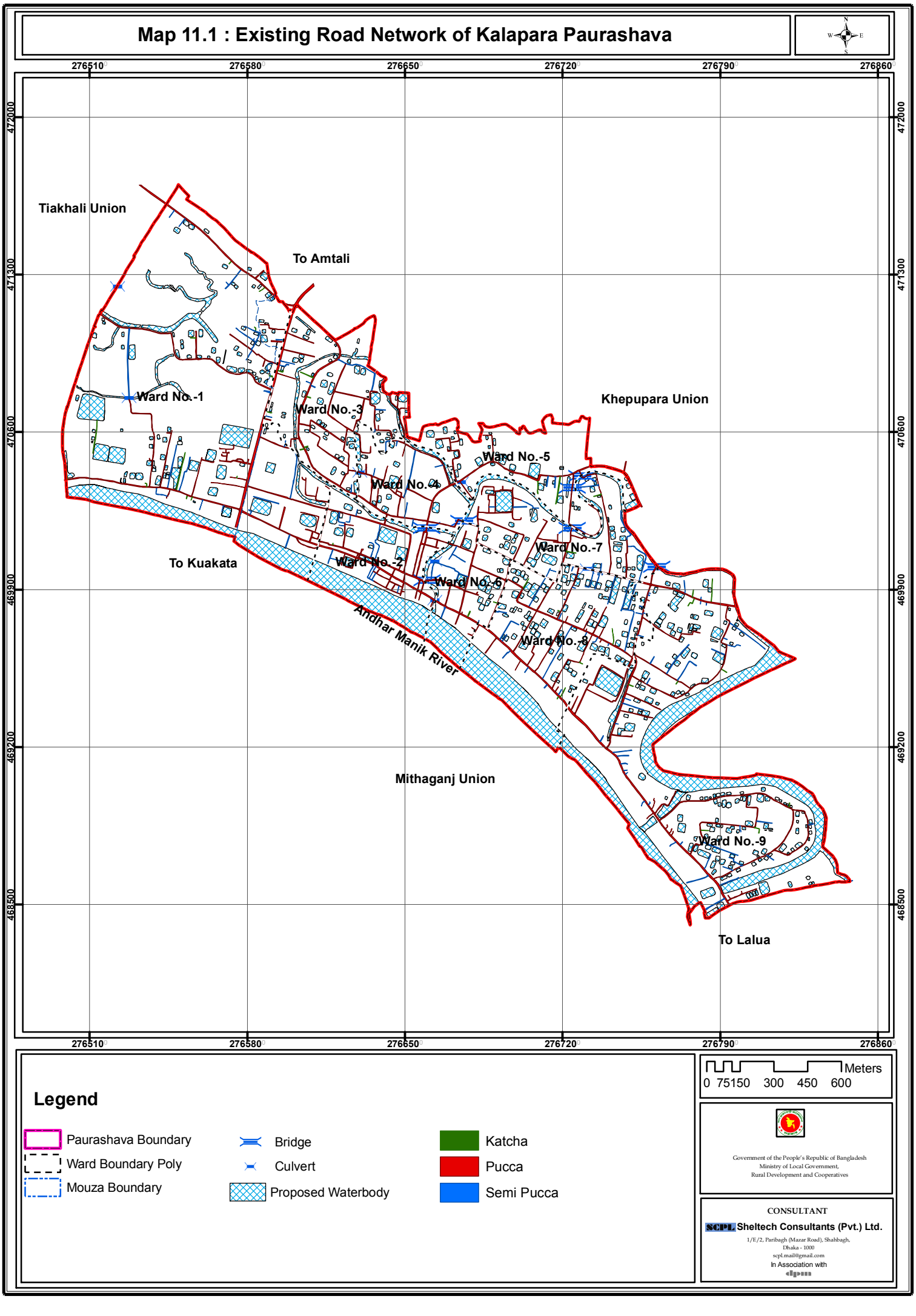
11.4.1 Travel Demand Forecasting for Next 20 Years

At Kalapara Paurashava, the existing road network is quite sufficient for accommodating present volume of traffic. At Kalapara Paurashava about 11.51% of the roads are kutcha and needs to be constructed as pucca or at least semi-pucca. Moreover, most of the roads are narrow. Road Alignment should be straight in main road for improving transport quality. Widening of these roads and new construction of some roads will act as a vital role for accommodating future traffic volume. Moreover, the people of Kalapara Paurashava depend on both road network and water transport network. This will also help to reduce pressure on road transport network. Forecasting travel demand requires variety of data such as historical data on traffic, missing link, economic importance, trip generation and distribution pattern, routes choice, modal spilt, etc. Growth direction is also a considerable component for the demand analysis of the road.

11.4.2 Transportation Network Considered

The primary road of Kalapara Paurashava is well connected in both north south and east west directions within the Upazila areas and the primary roads are also connected with secondary and access roads and all these roads maintain good connectivity within the Paurashava area. But these roads are not wide enough on the basis of standard. So, the narrow roads have to be widened on the basis of standards and katcha roads will be improved with the time and also traffic management system will be improved. Besides, some new roads also have been proposed to accommodate the future travel demand. Moreover, footpath facilities have to be introduced to meet up the demand of pedestrians.

Map 11.1 : Existing Road Network of Kalapara Paurashava



11.4.3 Future Traffic Volume and Level of Service

In the year 2011, the population of Kalapara Paurashava is about 17332 and after 20 years it will be 23902 (2031). At present highest PCU/hr are about 393.5 at non-hat day and at hat day is about 667.02. It means traffic congestion is not alarming.

It is expected that gradual implementation of the components prescribed in the Master Plan will increase traffic volume. But at the same time the roads will be widened and new roads will be constructed. So, the increase traffic will be accommodated by these roads.

After the improvement of roads, commercial and industrial activities will also be boost up. This may increase traffic volume of the area. The proposed transport network and traffic management system will make it possible to remain the traffic scenario stable for next 20 years.

11.5 Transportation Development Plan

The current chapter of the report is about Transport Development Plan covering its development plan proposals and management of the proposed project area up to the year 2031. The report describes existing transportation facilities and proposal on the important facilities such as, bus terminal, rickshaw stand, fuel station and passenger sheds.

11.5.1 Road Network Plan

The standards are meant for use by UTIDP, LGED and other planning and development agencies. The standards have been adopted by the consultants to draw up the transportation development plan. Following are the suggested planning standards (Table 11.2) for road network development. These road hierarchies are proposed based on the functional linkage of the road of Kalapara Paurashava.:

Table 11.2: Standards of Roads Proposed by PMO

Landuse Category	Hierarchy of Roads	Right of Way (ROW)
Circulation Network	Primary Roads	150-100 feet
	Secondary Roads	100-60 feet
	Tertiary Road	20-40 feet

Source: UTIDP, PMO,LGED

Kalapara is a small town with a very low volume of internal and external traffic movement. Considering traffic volume and discussion with Paurashava authority and local stakeholders consultants have established a road hierarchy based on the functional area within the Paurashava as well as the internal and external linkage. Existing Access roads will be connected with Tertiary and Secondary roads for better mobility. Following table shows the standard of future development of road network.

Table 11.3: Standard for Future Development of the Road Network

Landuse Category	Hierarchy of Roads	Right of Way (ROW)
Circulation Network	Paurashava Primary Roads	60-150 feet
	Paurashava Secondary Roads	40-50 feet
	Paurashava Local Roads	20-30 feet

Source: Proposed by Consultants

11.5.2 Design Principals and Standards

In preparing detail design some basic principals have been followed:

- Road Hierarchy Standards provided by PMO
- Relevant regulations of Building construction Act, 1952 (amendment in 1996), followed by Paurashava
- follow up the National Urban Land Transport Policy, 2004

- follow up the Transport planning relevant Books, articles and papers (Ref: Traffic Engineering and Transport Planning, Dr. L.R. Kadiyali)

A) Intersection improvement

This measures can be categorized into 2 types, are as follows:

a. Channelization
b. Improvement of Intersection geometry

Fig 11.3: Channelization Measures at Major Intersections

a. Channelization

Channelization of intersection at grade is the separation or regulation of conflicting traffic movements into definite paths of travel by the use of pavement markings, raised islands, or other suitable means to facilitate the safe and orderly movements of both vehicles and pedestrians. Channelization is done for:

- Separation of conflicts (by using roundabout, raised island, etc.)
- Reduction of conflict points
- Reduction of excessive pavement areas

b. Improvement of intersection geometry includes:

- Corner Plot widening
- Establishment of Traffic islands

According to Building Construction Act, 1996, in each Corner plot of major intersection, 1m×1m land area has to be open for traffic movement.

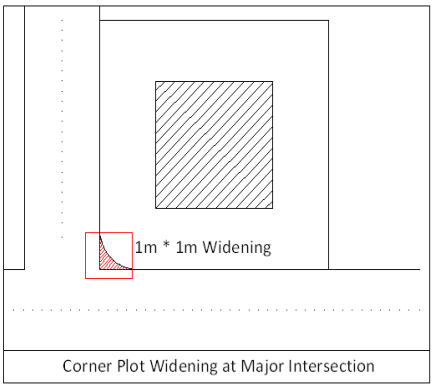


Fig 11.4: Corner Plot Widening at Intersections

B) Land use Proposals at the Major Intersections

According to Building Construction Act, 1996, the construction permission of Shopping Complex, Cinema Hall or similar type of buildings are restricted within 50 m (164 ft) from major road intersections to avoid traffic congestion.

C) Prioritization in ROW Space Allocation according to Road Hierarchy

In pertaining with the National Land Transport Policy, 2004, for promoting an efficient road transport system, provision of Motorized and Non-motorized vehicles is prioritized. Therefore, effective road space allocation and utilization is also emphasized in national policy. At first, a uniform priority has been fixed for designing the whole Road Network Development.

Basis of Prioritization

Prioritization has been formed in light of National Land Transport Policy, 2004.

- To promote the speed and mobilize the activities, motorized vehicles (especially Bus lane) are encouraged
- To make a environmental and economical balance (employment pattern and Income level), provision of non-motorized vehicles are kept
- To ensure safe movement of citizens, footway should be provided

Though, uniform space allocation is formed but Right Of Way (ROW), land use and the demand of different type of vehicles are not same throughout the whole Paurashava area. So, the design priority has been differed at road hierarchy as follows:

Space Allocation at ROW considering Road Hierarchy

Priority	Primary Road	Secondary Road	Tertiary Road	Access Road
1	Provide one lane (3.0m) for motorized vehicles including Bus, Car and Jeep etc. The width of each lane is minimum 3 m depending on the availability of space.	Provide one lane (3.0 m) for motorized vehicles including Bus, Car and Jeep etc. The width of each lane is minimum 2.5 m depending on the availability of space.	Provide one lane (3 m) for motorized and non-motorized vehicles including Car, Jeep, Motorcycle and Rickshaws etc. The width of each lane is minimum 2.5 m depending on the availability of space.	Provide one lane (3 m) for motorized and non- motorized vehicles including Car, Jeep, Motorcycle and Rickshaws etc. The width of each lane is minimum 2.5 m depending on the availability of space.
2	Non-motorized vehicle paths (Service lane), 2.5m wide in each direction with over-taking lane including physical segregation of .5ft wide and 1ft height concrete block.	Non-motorized vehicle paths (Service lane), 2.5m wide in each direction with over-taking lane including physical segregation of .5ft wide and 1ft height concrete block.	Pedestrian paths as per existing demand (minimum 1.5 m)	Pedestrian paths as per existing demand (minimum 1.5 m)
3	Pedestrian paths as per existing demand (minimum 1.5 m)	Pedestrian paths as per existing demand (minimum 1.5 m)	Provide one lane for motorized and non-motorized vehicles including Car, Jeep, Motorcycle and Rickshaws etc. depending on the availability of space.	
4	2 to 3 or more lanes for motorized vehicles. The width of each lane is minimum 2.5m depending on the availability of space.	2 to 3 lanes for motorized vehicles. The width of each lane is minimum 2.5m depending on the availability of space.		

Figure 11.5 shows the cross section of different types of roads.

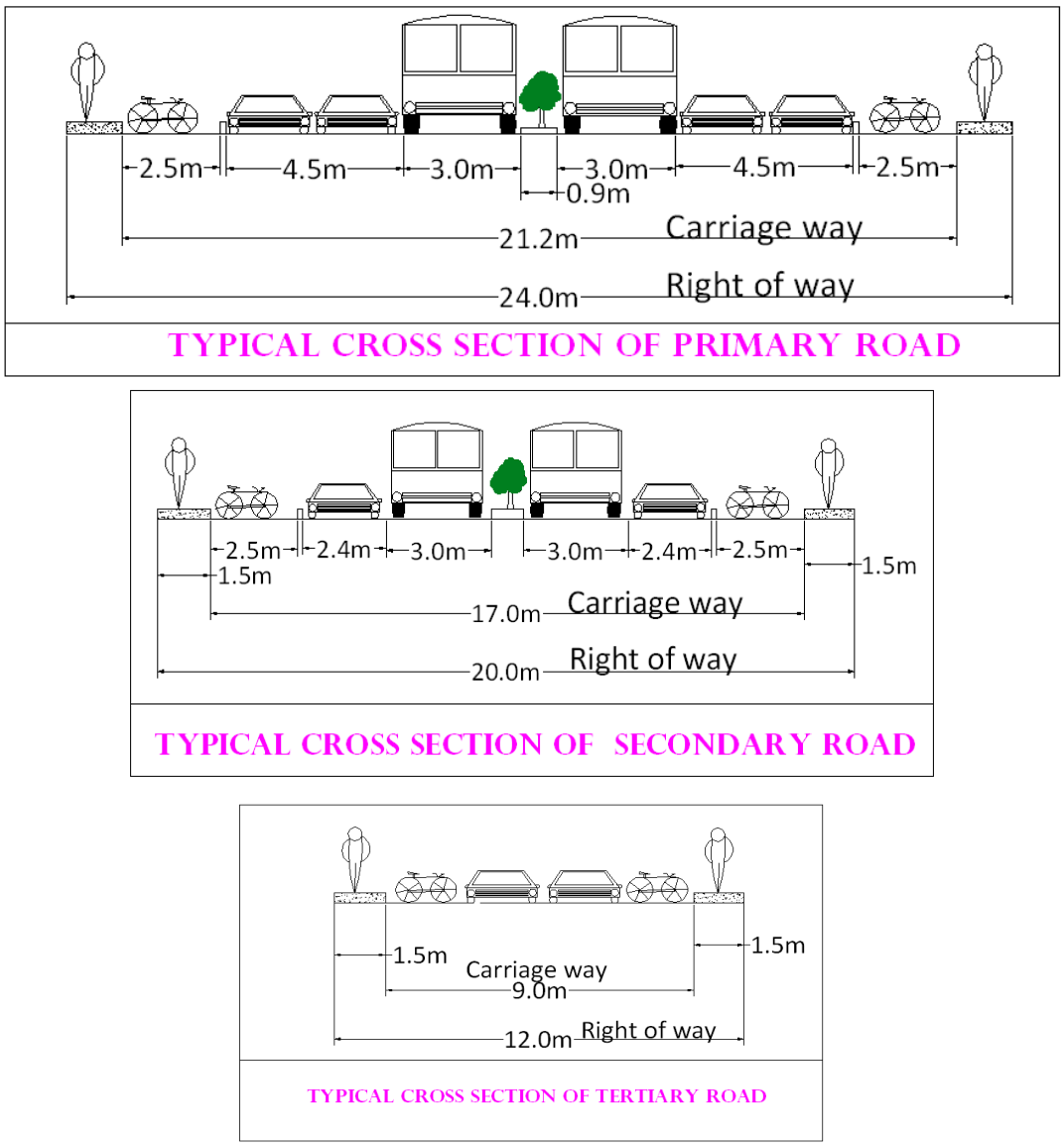


Fig 11.5: Typical Cross-Section of Various Types of Roads

11.5.3 Proposal for Improvement of the Existing Road Networks

The improvement plan for existing road network has been prepared considering two categories, which are as follows:

A. Roads connect Paurashava with Regional Road Network
B. Roads provide internal network of the Paurashava

All of the Road Should be developed in 20 years implementation time. It will be done in three phases; 1st phase (1st 5 years), 2nd phase (2nd 5 year) and 3rd phase (last 10 year). In the master plan, about 62.27 kilometers roads have been proposed for widening. Summary of road widening proposal has been shown in Table 11.4 and details have been shown in **Annexure E**.

Table 11.4 Summary of Road Widening Proposal for Existing Road

Road Type	Width (in ft)	Length (in km)	%
Primary Road	160	1.15	1.85
	80	2.25	3.61

Road Type	Width (in ft)	Length (in km)	%
	60	3.63	5.83
Secondary Road	40	14.07	22.60
Tertiary Road	30	2.87	4.61
	20	38.30	61.50
Total		**62.27**	**100.00**

A. Roads connect Paurashava with Regional Road Network

To avoid traffic congestion within the Paurashava, the road has been widened to 150 feet that goes to Amtali towards North direction. This road has considered the primary entrance of the Paurashava. Secondary road has proposed to connect east west direction of the area.

Hierarchically, the following types of roads have been proposed in the plan:

- major road having rights of way from 150 feet
- secondary road having rights of way from 40-50 feet of the right of way

B. Internal Network of the Paurashava

About 14.00 Km. secondary roads, 44.53 Km. tertiary roads and 3.92Km. walkway have been proposed in this Paurashava. All of the existing roads would be linked up with the proposed road so that eventually all parts of Kalapara Paurashava would be well connected.

Here, two types of roads have been proposed to cater the needs of the internal circulation of the Paurashava area. These are:

- secondary road having rights of way 40 to 50 feet
- local road having rights of way from 20 to 30 feet
- Walkway having width of 6 feet

Table 11.5: Summary of Proposed Roads of Kalapara Paurashava According to Hierarchy

Types of Road	Road Width (ft)	Length (km)	%
Paurashava Primary Road	150	0.99	1.55
	80	0.65	1.02
	60	3.63	5.69
Paurashava Secondary Road	40	14.00	21.94
Paurashava Tertiary Road	30	2.07	3.24
	20	38.54	60.41
Walkway	6	3.92	6.15
		63.80	**100**

Source: Proposed by Consultants

In the road network plan, more than 63.80 Km. of the roads have been proposed for future road network development of Kalapara Paurashava. Summary of road network proposal has been shown in Table 11.5 and details have been shown in **Annexure E**.

11.5.4 Proposals for New Roads

To accommodate the traffic volumes about 10-15% land has been considered of total planning area. About 13.77 kilometers new roads have been proposed to ensure accessibility in the area. Summary of new road proposal has been shown in Table 11.6 details have been shown in **Annexure E**. Proposed Road Network of Kalapara Paurashava has been presented on **Map 11.2**.

Table 11.6: Summary of New Road Proposal in Kalapara Paurashava

Road Type	Width (in ft)	Length (in m)	%
Primary Road	80	0.57	4.14
Secondary Road	40	2.96	21.50
Tertiary Road	20	6.32	45.90

Walkway	6	3.92	28.47
	Total	**13.77**	**100.00**

11.6 Plans for Other Transportation Facilities

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

11.6.1 Parking and Terminal Facilities

A) Parking Facilities

Parking facilities at Kalapara Paurashava has been provided considering two parameters:

- Individual Building: In this context, it is recommended to follow the Building Construction Act, 1996 (Sub-section 2&3, Section-13).
- Area wise Parking Facilities: As per area wise context, it is recommended to provide parking facilities in Commercial and Industrial area. As per Building Construction Act 1996, total 1st .26 acre land and 0.80 acre land will be declared as parking zone at commercial area and industrial area.

B) Terminal Facilities

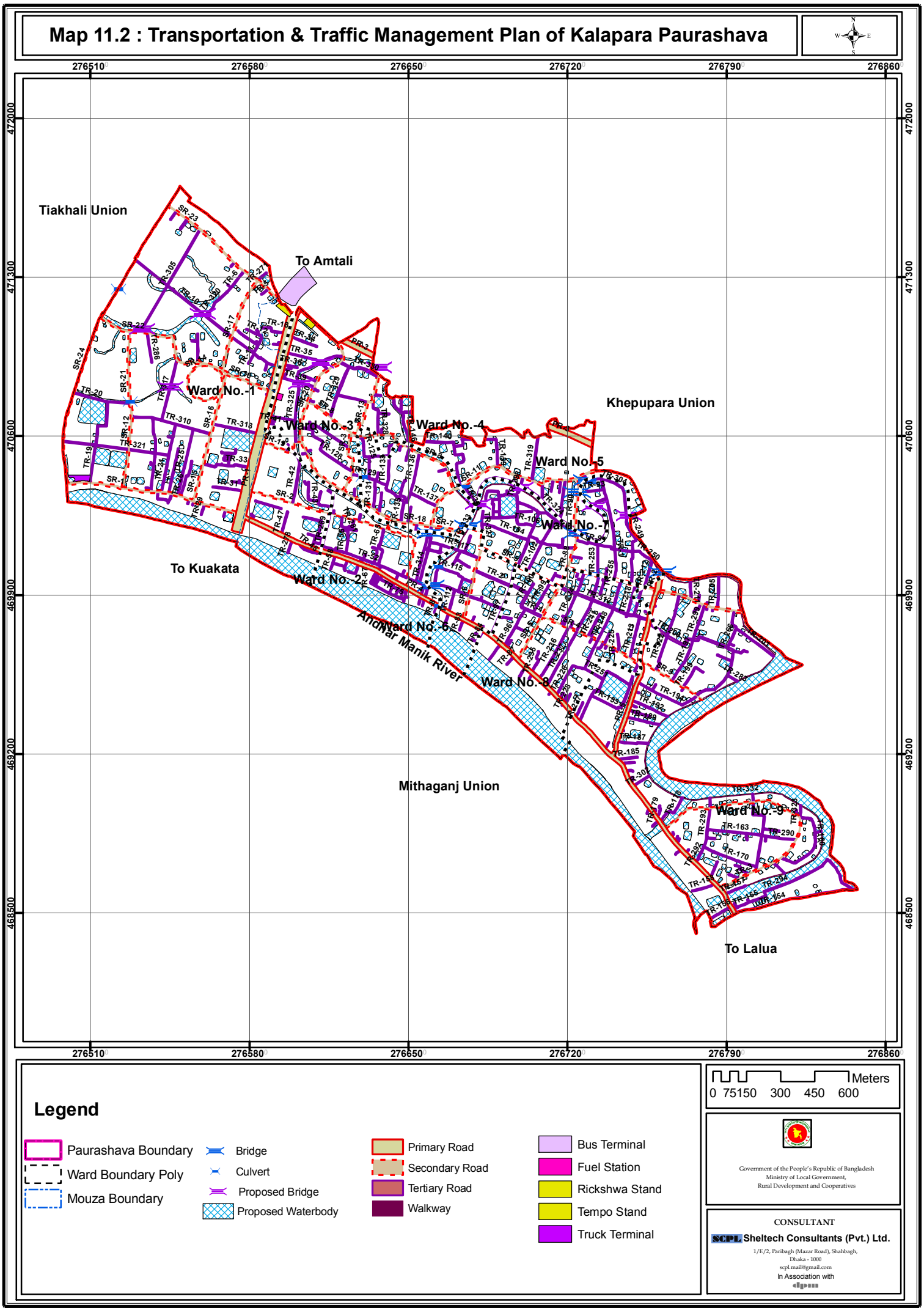
Considering future travel demand in next 20 years; Terminal facilities for Bus, Truck, Motorcycle, Rickshaw, Tempo and other existing transports have been provided.

- **Bus Terminal:** One Bus terminal has been proposed in ward no 1. The proposed terminal will comprise about 1st 3.09 acre areas. Detail has been given in Table 11.7.
- **Truck Terminal:** One Truck terminal has been proposed In ward no 1. The proposed terminal will comprise about 0.51 acre areas. Detail has been given in Table 11.7.
- **Rickshaw/Tempo Stand:** One Rickshaw stand and one Tempo stand have been proposed in ward no 3 and ward no. 1 respectively. Detail has been given in Table 11.7.
- **Other Vehicle Parking:** At Kalapara Paurashava, no Parking area will be proposed. But every important intersection has sufficient on street parking area in rights of way.
- **Launch Terminal & Ferry Ghat**: No new launch terminal and ferry ghat has been proposed rather the existing terminal and ghat has been proposed for expansion.

Table 11.7: Development Proposal for Transportation Facilities

ID	Type of facility	Ward no	Mouza Name	Plot No	Area (Acre)	Phase-wise development		
						1st Phase (1st to 5th year)	2nd Phase (6th to 10th year)	3rd Phase 11th to last 10 year)
DP-54	Bus Terminal	Extended Area	Khepupara	332,330,329,334,335	3.09	Land acquisition	Development Infrastructure	
DP-28	Truck Terminal	1	Khepupara	208, 213	1.01	Land acquisition	Development Infrastructure	
DP-24	Rickshaw Stand	3	Khepupara	360,362	0.31		Land acquisition and development all facilities	
DP-04	Fuel Station	3	Khepupara	347,346,350,351,352	0.19		Land acquisition and development all facilities	
DP-27	Tempo Stand	1	Khepupara	335,337	0.34		Land acquisition and development all facilities	
				Total	**4.94**			

Map 11.2 : Transportation & Traffic Management Plan of Kalapara Paurashava



Legend

- Paurashava Boundary
- Ward Boundary Poly
- Mouza Boundary
- Bridge
- Culvert
- Proposed Bridge
- Proposed Waterbody
- Primary Road
- Secondary Road
- Tertiary Road
- Walkway
- Bus Terminal
- Fuel Station
- Rickshwa Stand
- Tempo Stand
- Truck Terminal

Meters
0 75150 300 450 600

Government of the People's Republic of Bangladesh
Ministry of Local Government,
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In Association with

11.6.2 Development of Facilities for Pedestrians, Bicycles and Rickshaws

A) Pedestrians

Proposals regarding pedestrian walkway have been already depicted in proposed road network plan by providing separate walkway as per priority of facilities. About 1st .5m footpath has been already shown in primary and secondary roads.

B) Bicycles and Rickshaws

Facility provision of bicycles and rickshaws has been already depicted in space allocation of Right of Way (ROW). Separate Service lane of 2.5 m has been already shown in Primary road and 18.m lane in Secondary Roads in figure11.5.

11.6.3 Other Transportation Facilities

One fuel station has been proposed at ward no 3 comprising about 0.19 acre of land. Detail has been given in Table 11.7.

11.7 Waterway Development / Improvement Options

At present, water transport facility has significant importance for carrying passenger and commodity. If waterway network can be developed, this will reduce pressure on road network and will also boost up the economic development of the area. Therefore, some measures should be taken to promote the water transport network in Kalapara Paurashava area:

- Development of infrastructural facilities
- Dredging and maintenance of existing navigable waterways and for resuscitation of dead or dying rivers, channels, or canals, including development of new channels and canals for navigation
- Carry out removal of wrecks and obstruction in inland navigable waterways
- Ensure co-ordination of Inland Water Transport with other forms of transport and with trade and agricultural interests for the optimum utilization of the available transport capacity
- Promote good quality launch services
- Develop, maintain and operate landing/station and terminal facilities
- Prepare plans or schemes for carrying out any of the above mentioned functions by BIWTA.

11.8 TRANSPORTATION SYSTEM MANAGEMENT (TSM)

Fundamental traffic management (TM) regulations have been in practice from the very beginning for example, rules to use a particular side (left or right) of the road. However, the modern objectives of traffic management also include operational efficiency of traffic and improvement of environment.

The main purposes of traffic management are:

- To ensure safe movement of all vehicular and pedestrian traffic
- To improve operational efficiency (junction and network links) in terms of traffic flow
- To improve the environment

The most important aspect of traffic management is its major involvement in its efficient use of basically existing facilities. These may be in the form of:

- Rules and regulations governing the use of facilities. For example, right of use of a roadway, speed limit etc. and

- New works and improvements of limited scale like flow control and segregation measures and devices

11.8.1 Strategies for Facility Operations

Parking Management

In Kalapara Paurashava, parking measures are considered for:

- Bus Terminal
- Truck Terminal

To provide parking space, following regulations mentioned in Building Construction Rule, 1996 should be provided:

- Parking functions should be maintained with the Parking or Stand lot, Roads cannot used for maneuvering the vehicles
- For entrance and exit of Bus and Truck in the Terminal minimum 4.5 meter width should be provided
- On-Street Parking is applicable if:
    - Angular Parking should be provided within 45^{o}
    - Within 25 meter of Pedestrian Crossing or Intersection, no parking would be allowed
    - No parking will be allowed over the Highway

11.8.2 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 the hierarchy of road network. Implementation will also be followed following this hierarchy.
- Proposed roads in those areas will be chosen for immediate construction that is needed to promote growth in that area.
- Service roads will be constructed along with the major roads to allow free flow of long distance traffic.
- Bill board should be installed conveying road safety messages and instructions.
- Speed breaker should be provided at the in-front school, colleges and hospitals etc.

11.8.3 Strategies for Traffic Management

- Connect the missing links of primary, secondary and access roads on priority basis.
- Separate lane for non-motorized vehicles should be provisioned on the primary and secondary roads.
- Widen the narrow roads to make networks for efficient circulation.
- Right of Way (ROW) should be kept free from any type of development activities.
- Provide adequate pedestrian facilities and off-street parking wherever needed.
- If requires, tidal flow operation method can be applied in case of some roads. For instance, the morning peak results heavy flow of traffic towards city centre and evening peak results heavy flow towards the outside from the City Centre. In this case, half of other side lane can be utilized for one direction traffic during peak hour.

11.9 Plan Implementation Strategies

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

Regulations 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 of the Public Roads Act, 2004 has defined public roads as-

(1st) 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 7thJuly 1861. Section 1st 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(1a) 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(1a) 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(1st) 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.

Implementation, Monitoring, Evaluation and Coordination of the Plan

Implementation through Multi-Sectoral Investment Program: 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 Program (MSIP).

Objective of a Multi-Sectoral Investment Program (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 layout 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 program 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 ongoing and implemented projects is essential to keep the future course of action on the right track. An ongoing 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 Drainage Management Plan

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

12.1.1 Goals and Objectives

Provision of drainage facilities are important concern to human settlements to create better living environment. Failure to provide the adequate drainage facilities results in flooding and detrimental environmental quality. Drainage of high rainfall region particularly in the context of Barisal region is very important. The objectives of drainage planning are described as follows:

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

12.1.2 Methodology and Approach to Planning

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

- Survey the main drainage channels from their heads to the outfalls and to estimate their capacity to discharge water.
- Collect and analyze meteorological data over time in the area to determine the meteorological conditions and predict storm surges.
- Determine the efficiency of the present drainage systems and make recommendation to government.
- Organize a public enlightenment campaign to expose the adverse effects of dumping refuse in drainage channels, through a mass media meeting.
- Drainage channels were surveyed by leveling from the head of the channels to the outfall using a surveyor's level. A zero datum was chosen at the head of each channel. This zero height was then used to level the channel from the head to the toe or outfall. In areas where water flow was observed, the velocity of the flow was recorded. The flow velocity was

calculated by timing the flow rate within a 3-5m length of channel. In areas where sediment or refuse was observed to accumulate in the bottom of the channel, the thickness of such sediment or refuse was measured.

- A questionnaire was administered to local residents to collect information about flooding, refuse disposal and drainage channel patterns from local residents along flood prone areas. The answers to the questionnaire were statistically analyzed and use to decipher resident's opinion on the problem of flooding.

12.2 Existing Drainage System/ Network

12.2.1 Man Made Drains

Paurashava has only 9.44 km of pucca drainage network at Kalapara Paurashava office area. This drainage network served mainly within the area beside Andharmanik river. Maximum people of the Paurashava deprived from drainage facility at Kalapara Paurashava. Table 12.1 shows inventory of major drain in Kalapara Paurashava.

Table 12.1: Existing Inventory of Drains

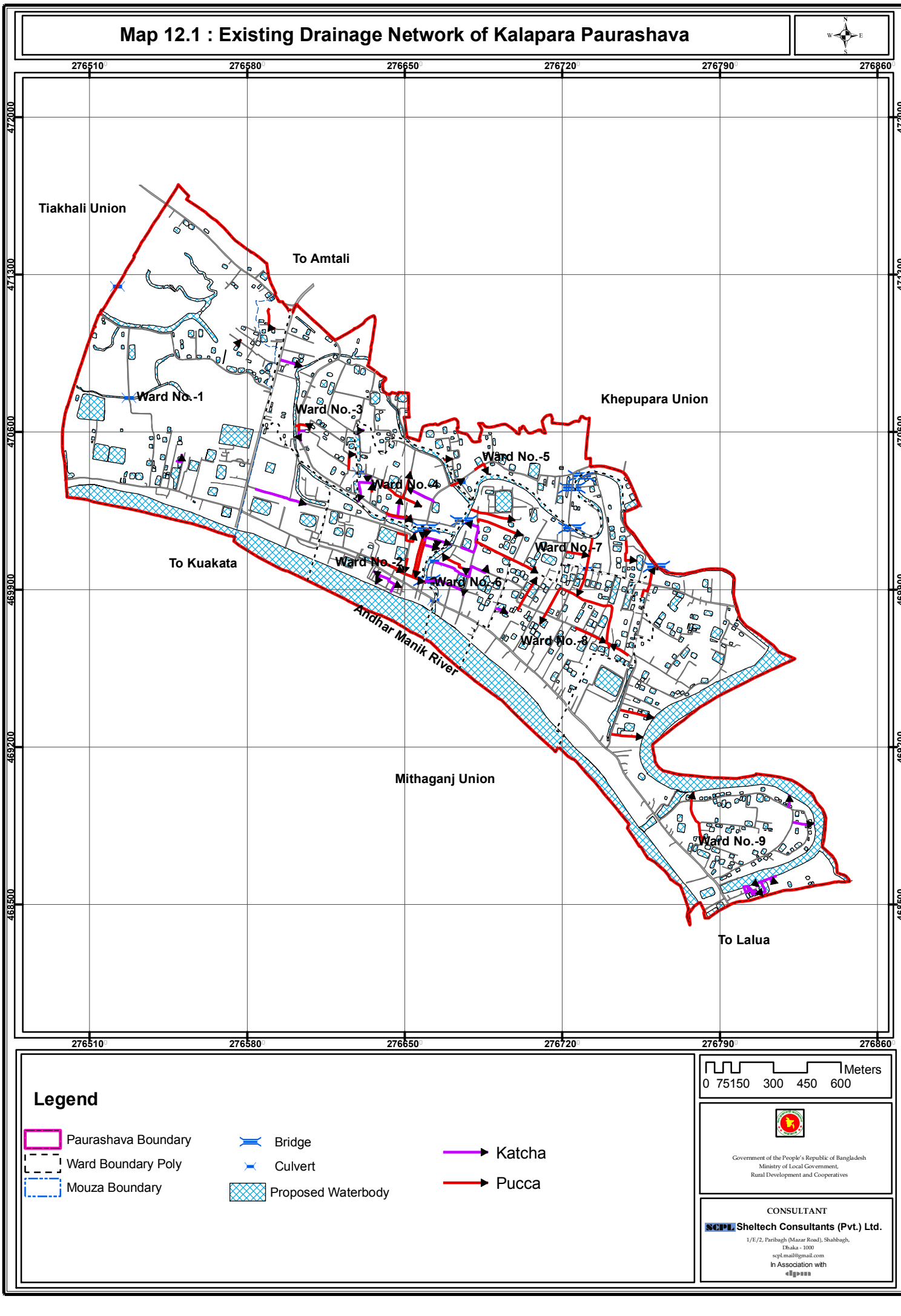
Drain Id	Type	Width (in ft)	Length (in m)	Connectivity	
				Start Point	End Point
D-1	Pucca	2	238.40	Ward No.-1	Ward No.-1
D-2	Pucca	2.5	115.51	Ward No.-1	Ward No.-1
D-3	Pucca	2	57.19	Ward No.-1	Ward No.-1
D-4	Pucca	2.5	36.319	Ward No.-1	Ward No.-1
D-5	Pucca	2.5	135.82	Ward No.-2	Ward No.-2
D-6	Pucca	2.5	32.36	Ward No.-2	Ward No.-2
D-7	Pucca	2.5	72.40	Ward No.-2	Ward No.-2
D-8	Pucca	2.5	45.23	Ward No.-2	Ward No.-2
D-9	Pucca	2.5	161.58	Ward No.-2	Ward No.-5
D-10	Pucca	2	139.75	Ward No.-2	Ward No.-2
D-11	Pucca	2.5	72.00	Ward No.-2	Ward No.-2
D-12	Pucca	2.5	142.62	Ward No.-2	Ward No.-5
D-13	Pucca	2.5	161.12	Ward No.-2	Ward No.-5
D-14	Pucca	2.5	214.38	Ward No.-2	Ward No.-2
D-15	Pucca	2.5	37.66	Ward No.-2	Ward No.-2
D-16	Pucca	2.5	169.34	Ward No.-2	Ward No.-2
D-17	Pucca	2.5	33.13	Ward No.-2	Ward No.-2
D-18	Pucca	2.5	79.09	Ward No.-3	Ward No.-3
D-19	Pucca	2.5	100.05	Ward No.-3	Ward No.-3
D-20	Pucca	2.5	85.75	Ward No.-3	Ward No.-3
D-21	Pucca	2.5	22.10	Ward No.-3	Ward No.-3
D-22	Pucca	3.5	96.93	Ward No.-3	Ward No.-3
D-23	Pucca	2.5	34.75	Ward No.-4	Ward No.-4
D-24	Pucca	2.5	43.15	Ward No.-4	Ward No.-4
D-25	Pucca	2.5	113.15	Ward No.-4	Ward No.-4
D-26	Pucca	2.5	92.04	Ward No.-4	Ward No.-4
D-27	Pucca	2.5	141.28	Ward No.-4	Ward No.-4
D-28	Pucca	2.5	148.43	Ward No.-4	Ward No.-4
D-29	Pucca	2.5	40.89	Ward No.-4	Ward No.-4
D-30	Pucca	2.5	220.64	Ward No.-4	Ward No.-4
D-31	Pucca	2.5	122.28	Ward No.-4	Ward No.-4
D-32	Pucca	2.5	124.80	Ward No.-4	Ward No.-4
D-33	Pucca	3.5	39.65	Ward No.-4	Ward No.-4
D-34	Pucca	2.5	72.62	Ward No.-4	Ward No.-4
D-35	Pucca	2.5	39.65	Ward No.-5	Ward No.-5
D-36	Pucca	2.5	99.24	Ward No.-5	Ward No.-5
D-37	Pucca	2.5	72.62	Ward No.-5	Ward No.-5
D-38	Pucca	2.5	33.44	Ward No.-6	Ward No.-6
D-39	Pucca	2.5	135.82	Ward No.-6	Ward No.-6
D-40	Pucca	2.5	59.86	Ward No.-6	Ward No.-6

Drain Id	Type	Width (in ft)	Length (in m)	Connectivity	
				Start Point	End Point
D-41	Pucca	2.5	203.57	Ward No.-6	Ward No.-6
D-42	Pucca	2.5	319.17	Ward No.-6	Ward No.-6
D-43	Pucca	2.5	237.15	Ward No.-6	Ward No.-6
D-44	Pucca	2.5	44.70	Ward No.-6	Ward No.-6
D-45	Pucca	2.5	142.62	Ward No.-6	Ward No.-6
D-46	Pucca	2.5	311.77	Ward No.-6	Ward No.-6
D-47	Pucca	2.5	119.48	Ward No.-6	Ward No.-6
D-48	Pucca	2.5	99.24	Ward No.-7	Ward No.-7
D-49	Pucca	4	311.77	Ward No.-7	Ward No.-7
D-50	Pucca	4	204.96	Ward No.-7	Ward No.-7
D-51	Pucca	2.5	222.63	Ward No.-7	Ward No.-7
D-52	Pucca	2.5	144.22	Ward No.-7	Ward No.-7
D-53	Pucca	3.5	163.58	Ward No.-7	Ward No.-7
D-54	Pucca	2.5	268.89	Ward No.-7	Ward No.-7
D-55	Pucca	2.5	106.14	Ward No.-7	Ward No.-7
D-56	Pucca	2.5	59.86	Ward No.-8	Ward No.-8
D-57	Pucca	2.5	156.12	Ward No.-8	Ward No.-8
D-58	Pucca	2.5	97.74	Ward No.-8	Ward No.-7
D-59	Pucca	2.5	627.38	Ward No.-8	Ward No.-7
D-60	Pucca	4	170.29	Ward No.-8	Ward No.-8
D-61	Pucca	4	268.89	Ward No.-8	Ward No.-7
D-62	Pucca	2.5	116.67	Ward No.-9	Ward No.-9
D-63	Pucca	2.5	47.22	Ward No.-9	Ward No.-9
D-64	Pucca	2.5	261.66	Ward No.-9	Ward No.-9
D-65	Pucca	2.5	58.94	Ward No.-9	Ward No.-9
D-66	Pucca	3.5	97.26	Ward No.-9	Ward No.-9
D-67	Pucca	2.5	154.22	Ward No.-9	Ward No.-9
D-68	Pucca	2.5	163.58	Ward No.-9	Ward No.-9
D-69	Pucca	3.5	141.37	Ward No.-9	Ward No.-9
D-70	Pucca	2.5	240.17	Ward No.-9	Ward No.-9
Total			**9444.3**		

Source: Physical Feature Survey, 2013

Table 12.1 shows the ward wise manmade drainage coverage in Kalapara Paurashava. Total man made drainage coverage in Kalapara Paurashava for total length of 9.44 kilometer and it covers all Wards. The highest drainage coverage concentrates in ward no. 02, total length of 1.42 kilometer drainage coverage exist in this ward. **Map 12.1** Shows the existing Drainage Network of Kalapara Paurashava.

Map 12.1 : Existing Drainage Network of Kalapara Paurashava



Legend

- Paurashava Boundary
- Ward Boundary Poly
- Mouza Boundary
- Bridge
- Culvert
- Proposed Waterbody
- Katcha
- Pucca
- Proposed Bridge

Meters
0 75150 300 450 600

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

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In Association with

12.2.2 Natural Canal and River

General Description of Natural Canals

The existing natural canal network is spread like tree roots in total Paurashava area. In some portion of the area the condition of the khal and irrigation canal are being encroached by the local people and also by local authority and the situation is deteriorating day by day. So, it should be given much concern to sustain the natural canal.

Andharmanik River passes beyond the project area. It has been observed from the physical features survey that 9.57 km of canals/khals are passing through the project area. Table 12.2 shows the length and connectivity of Khals of Kalapara Paurashava and ward wise area coverage of the canals are presented in Table 12.2.

Table 12.2: Drainage Coverage of Existing Canals/Khals in Kalapara Paurashava

Name	Width (in ft)	Length (in m)	Starting Point Connection	End Point Connection
Canal 1	61.94	2,297.82	Ward 9	Ward 9
Canal 2	16.28	2,974.62	Ward 9	Canal1
Canal 3	14.83	1,037.58	Ward 1	Canal 2
Canal 4	10.37	1,599.49	Ward 3	Ward 4
Canal 5	7.97	698.43	Ward 1	Ward 1
Canal 6	19.51	960.48	Ward 1	Ward 1
Total		**9,568.42**		

Source: Physical Feature Survey, 2010-13

River

Kalapara Paurashava comprises one river namely Andharmanik which encloses about 473.39 acre of the Paurashava area.

Other Water Bodies (Pond-Dighi-Ditch and Dyke)

At Kalapara Planning area, about 110.31 acre areas are under water bodies comprising ditch and pond. There are about 59 ditches covering 5.45 acre area and 694 ponds comprising 104.86 acre area. Among the all wards ward no. 1 and ward no. 9 have the highest number of ditches and ponds respectively.

Table 12.3: Ward-Wise Area Coverage of Existing Waterbodies at Kalapara

Ward No.	Ditch		Pond		Total	
	Number	Area (acre)	Number	Area(acre)	Number	Area (acre)
W-1	9	1.77	135	23.23	144	25
W-2	0	0	13	5.56	13	5.56
W-3	6	0.92	72	6.69	78	7.61
W-4	9	0.67	28	3.90	37	4.57
W-5	4	0.15	37	7.91	41	8.06
W-6	0	0	23	5.17	23	5.17
W-7	1	0.19	40	10.69	41	10.88
W-8	3	0.31	110	14.11	113	14.42
W-9	27	1.44	236	27.60	263	29.04
Total	**59**	**5.45**	**694**	**104.86**	**753**	**110.31**

Source: Physical Feature Survey, 2010-13

12.2.3 Topographic Condition of Existing Drainage Network

Existing natural drainage network and direction of natural flow depends on the elevation of the area. The minimum and maximum ground level varies from 1.07m to 4.51m and average height is 2.18 m. From the survey, it has been observed that ward no.1 is the high land area in respect of other wards. The highest spot value (4.51m) location is at ward no. 9 and lowest value (1.07m) has observed at ward no 8. The flow of storm water will be from the high land to the lowlands and the ultimate destination is the river, cannels and ponds.

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

Drain as the structure is generally develops to free our living area from household waste water and rain water of storm water. The daily waste water discharge from a household is negligible so for the drainage design it is necessary to calculate the storm water. Urban storm drainage primarily concerns this surface run-off. The primary objective of urban drainage system design is to drain out this storm water either through open surface drains or through underground sewers. An important parameter for the design of storm water systems is the rate and volume of run-off to be conveyed through the system as a consequence of storms. Run-off estimates are carried out based on knowledge of the occurrences of heavy rainstorms and a relation between rainfall and the corresponding run-off. The quantity of run-off again depends on the geometry and physical properties of the catchments.

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

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

Q = CsC r IA

Q = Design runoff flow rate (cfs)

I = Rainfall intensity (in/hr)

Cs = Storage coefficient

Cr = 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 12.4.

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

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

And

$T_t = V / (60L)$

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

Table 12.4: 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	Asphalt	0.013-0.017
Helically corrugated metal pipe (12'' – 48'')	0.013-0.023	Brick	0.012-0.018
Paved invert	0.018-0.022	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 12.5

Table 12.5: Storage Coefficients for Fat 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 (Cr) 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 (Cr) for each land use classification are listed in Table 12.6

Table 12.6: Modified Rational Method Runoff Coefficients

Land use designation	Runoff Coefficient Cr	Land use designation	Runoff Coefficient Cr
Residential rural	0.30	Agricultural exclusive	0.25
Residential semi urban	0.40	Forest and watershed	0.20-0.25
Residential urban	0.5-0.60	Public facilities	0.30-0.60
Apartment professional	0.70	Forest/ woodland	0.25
Neighborhood Commercial	0.85	Paved area/road	0.99
Community Commercial	0.85	Slum area	0.50-0.55
Industrial	0.70-0.75		

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

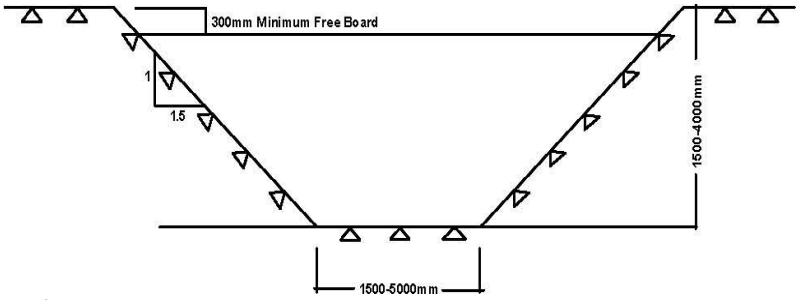
In implementing various infrastructures for development, drainage is generally given less priority and is normally considered to be the last or final steps for development. Such scenario is particularly true for Bangladesh; although different types of drainage infrastructures are among others by far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

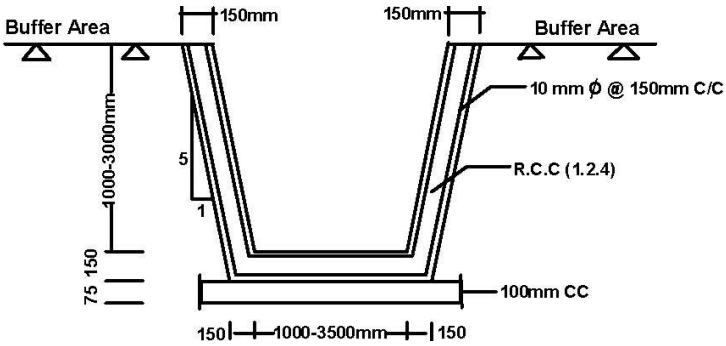
Drainage development for urbanization should start with drains. Drains can be classified as Plot drains, Block drains, Tertiary drains, Secondary drains and Primary drains. Other natural drainage infrastructure is lowland, outfall areas, khals and rivers. Man-made drains are Plot, Block, Tertiary, Secondary 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 planning.

Primary Drain

Primary drains are called as the main drains. Primary drains cover larger storm drainage area than above discussed tertiary and secondary drains. In ascending order its position is third. Its cross-section is larger than other types; carrying capacity is high and is constructed of brick, cement concrete and sometimes reinforced concrete. Primary drains may be of earthen structure provided sufficient land is available and land value is low. Contributing drainage water comes from tertiary and secondary drains. Primary drains discharge its drainage water to outfall, natural khal, river or large lowland area/ Beels. Figure 12.1 and 12.2 show the typical cross-section of the primary drain.



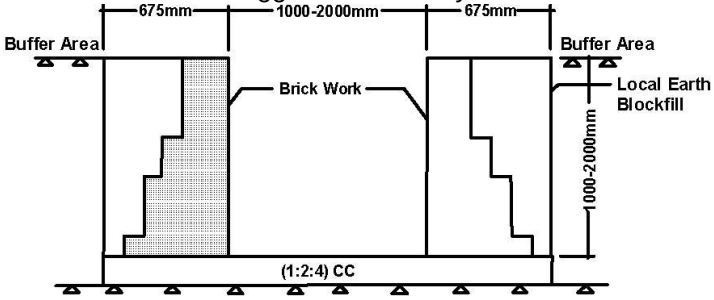
A Typical Earthen Primary Drain (Dimensions in mm)
Figure 12.1: Earthen Primary Drain



A Typical RCC Primary Drain (Dimensions in mm)
Figure 12.2: Typical RCC Primary Drain

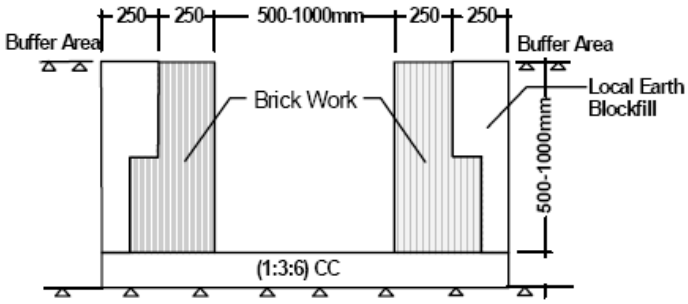
Secondary Drain

Secondary drains collect discharge from tertiary drains. One secondary drain may receive drainage discharges from several tertiary drains in its course. Size and capacity of secondary drain is much bigger than tertiary drains, its catchment area is also bigger than tertiary drains. Like tertiary drains, it may run parallel to bigger roads. Secondary drains may run along and through the middle of its storm water contributing area. The typical cross-section, size and shape, and its construction material are shown in Figure 12.3.



A Typical Secondary Drain (Dimensions in mm)
Figure 12.3: A Typical Secondary Drain

Tertiary Drain



A Typical Tertiary Drain (Dimensions in mm)

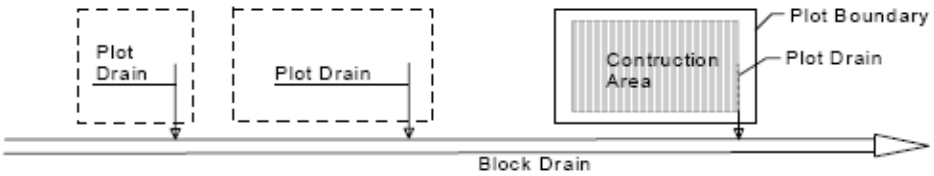
Figure 12.4: A Typical Tertiary Drain

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. Tertiary drains generally are the under jurisdiction of municipality and city corporation. These drains or drainage networks are constructed and maintained directly by municipalities and City Corporation. These drains are constructed by brick, cement concrete and sometimes by excavating earth in their alignments. These drains may run parallel to road or across the catchment area. Sometimes borrow pits of the road serves as drains provided borrow pits are uniformly and continuously excavated. Borrow pits that serve as drains may be channeled or lined by brick works. Tertiary drains deliver its discharge usually to secondary drains. A typical tertiary drain is shown in Figure 12.4.

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

Plot Drains

Plot drains are provided around a building on a plot. In most cases, the drain is made of bricks and rectangular in shape that can carry storm water generated in the plot and from the building. Plot drain is connected to the Block or Mohallah drain. Figure 12.5 below gives an impression of plot drain usually constructed in a plot and block drains that follow plot drain.



A Sketch Showing Plot and Block Drain
Figure 12.5: Plot and Block Drain

Block Drain

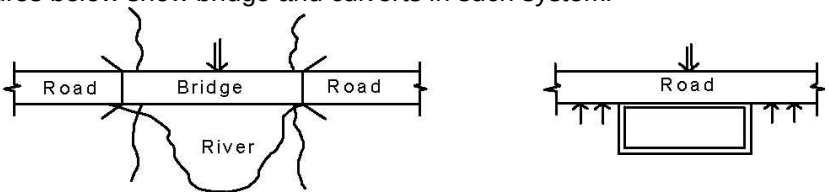
A block drain is provided at the outside of a block that accommodates several buildings of the block. The block drains are made of bricks like plots drains but bigger in size so that it can serve the storm water generated within the block and the buildings and open areas within the block. Sometimes the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

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

- Bridges, culverts, box culverts
- Drainage sluices, pipe sluices, siphons
- Flood protection embankments and flood walls
- Sluice gates, Regulators, Navigation lock
- Flood protection and drainage structures.

Bridges, Culverts and Box Culverts

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



Definition Sketch Bridge Definition Sketch Culvert
Figure 12.6: Bridge and Culvert

Drainage sluices, pipe sluices and siphons

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

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

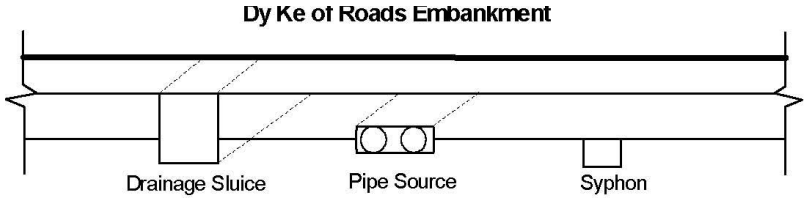


Figure 12.7: A Schematic View of Drainage Sluice, Pipe Sluice and Siphon on Embankment Which Relieve Drainage Congestion.

12.3 Plans for Drainage Management and Flood Control

12.3.1 Plan for Drain Network Development Drainage Network Plan

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

12.3.2 Proposal for Improvement of the Existing Drain Networks

Paurashava has only 9.44 km pucca drainage network at western part of Kalapara paurashava. A narrow portion of the Paurashava is served by this network system. Based on the results of drainage study it is recommended for the existing drain that:

- Rehabilitate broken drains;
- Cover the open drains based on budget allocation.

- Construction of new channels and rehabilitation of old ones with enough drainage head.
- Construct a new pump drainage network for the area towards Paira River.
- Remove all un-authorized structures, which developed on drainage structures.
- Regular cleaning and maintenance by the concerned authorities.
- Embarking on a sustained public enlightenment to discourage residents from dumping their refuse into drainage channels.

12.3.3 Outfall of Drains

There are 3 sluice gates exists, without any formal outfall of drains in or outside Kalapara Paurashava. The secondary drains mainly discharge storm water to the nearby khals and borrow pits, which will be act as primary drain. One of the existing sluice gate situated by the side of Kalapara-Patuakhali road is being proposed to up grate up to three gates. Total 45 drainage out falls are proposed for drainage development plan of Kalapara Paurashava.

12.3.3.1 List of Proposed New Drains

There is 9.57 km existing main khals in Kalapara Paurashava. These will be served as primary drain. Based on this primary drain drainage network system of Kalapara Paurashava will be established. Table 12.7 shows the summary of proposed drainage facilities at Kalapara Paurashava. And Map 12.2 shows the drainage network proposal for Kalapara Paurashava. In additional the Andharmanik River flowing by the side of Kalapara Paurashava will serve as the main out fall and main natural drainage network. Phasing of proposed drains has been shown in **Annexure F**. **Map 12.2** represents the proposed drains in Kalapara Paurashava.

Table 12.7: Summary of Proposed Drain

Type of Drain	Length (in m)	Length (in km)	%
Primary	1666.43	1.67	2.88
Secondary	15260.60	15.26	26.34
Tertiary	41013.32	41.01	70.78
Grand Total	**57940.35**	**57.94**	**100**

12.3.3.2 List of Infrastructure Measures for Drainage and Flood Control Network

Total 35 Box culverts 96 Pipe culverts and 3 sluice gates will be established for drainage and flood control network of Kalapara Paurashava.

12.4 Implementation Strategies and Principles

12.4.1 Plan Implementation Strategies

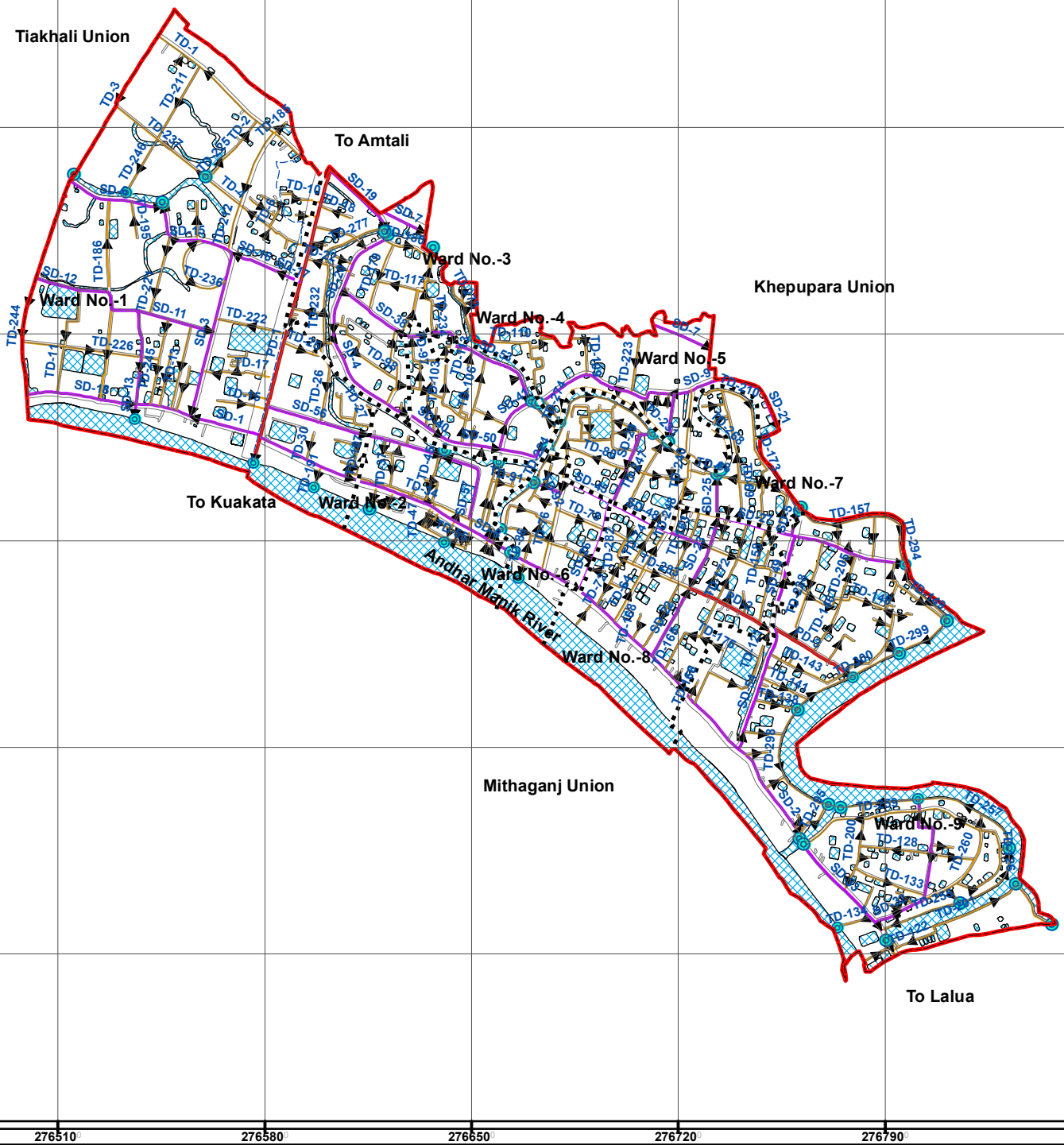
Management of a drainage system is more difficult than its construction. It requires not only an institutional set up but also huge resources for regular maintenance. The present engineering set up of the Paurashava is highly inadequate to manage the future drainage network. It must be equipped not only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

12.4.2 Regulations to Implement the Drainage and Flood Plan

Regulations in Bangladesh which are related to drainage and flood management:

1. **The Acquisition and Requisition of Immovable Property Ordinance, 1982,** for acquisition of land to construct drainage and flood control structures. The Bangladesh Water Development Board is main executing organization to implement drainage and flood control activities.
2. **National Water Policy (NWP)-1999,** regulatory policy to construct structures for flood control and drainage management. The Bangladesh Water Development Board is the executing and regulatory organization.
3. **National Water Management Plan (NWMP)-2004,** regulatory plan for management of flood, drainage and water resources of Bangladesh. The Bangladesh Water Development Board is the executing and regulatory organization. Local Government Engineering Department (LGED) is responsible for management of small scale water resources in Bangladesh.
4. **Canal and Drainage Act, 1872** has enacted for excavation of canal and removal of drainage congestion from agriculture land.
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.
6. **Playfield, Open Space, Park and Natural Water Reservoir Conservation Act 2000** has enacted for the provision to control the illegal development activities on natural water body of Metropolitan city, Divisional town, District town and all other Paurashava area. The act also enacts that Natural Streams (River, khal, Beel, Large pond/ Lake, Waterfall or water bodies which is identified in Master Plan or any place as flood flow area, rain water or other natural drainage water reservoir area proclaimed by Government, Local Government or any organization

Map 12.2 : Drainage & Environment Management Plan of Kalapara Paurashava



Legend

- Paurashava Boundary
- Ward Boundary Poly
- Mouza Boundary
- Proposed Outfall
- Proposed Waterbody
- Primary Drain
- Secondary Drain
- Tertiary Drain

0 25 50 100 150 200 Meters

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

CONSULTANT
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In Association with

12.5 Environmental Management Plan

12.5.1 Introduction

Environment is an important consideration during preparation of a Master Plan of an area. During the preparation of Master Plan of Kalapara Paurashava, different environmental issues have been analyzed and information has been collected accordingly. Information on drainage, sewerage (location/network, condition) and solid waste management system (existing and proposed plan), pollution sources and types also have been analyzed.

12.5.2 Goals and Objectives

The objectives of environmental study are as follows:

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

12.5.3 Methodology and Approach to Planning

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

12.5.4 Existing Environmental Condition

12.5.4.1 Geo-morphology Geology, Soil, Sub soil Condition

Kalapara Paurashava has three main types of soils with different qualities. Calcareous grey floodplain soils are structured grey silt loams to silty clays. The northern part of the area has silty clay loam of the Ganges River. The southern part has grey silty clay of the Andharmanik River. However, soil condition of Kalapara Paurashava comprises diversified characteristics.

12.5.4.2 Climate

The Climate of an area is comprised of its Temperature, Average Humidity (%), Rainfall, Wind Speed and Hydrology. This zila bears a hot summer and a mild winter. But almost all the area of the zila is occasionally affected by cyclonic storm surges and tidal bores that originate over the Bay of Bengal during monsoon.

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12.5.4.3 Temperature

Temperature rises steadily from January to April remains fairly steady from April to October and then falls to reach the lowest in January. The maximum average monthly

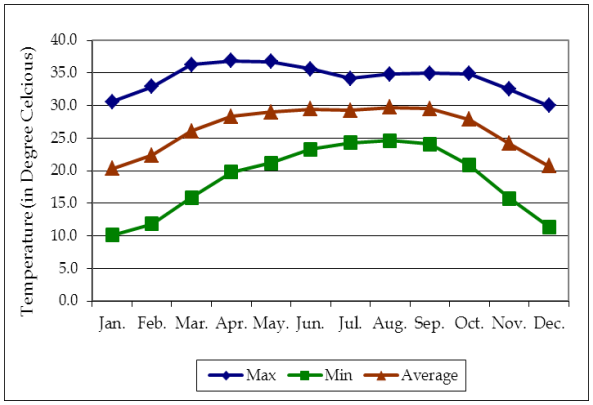

Figure 12.8: Monthly Average Temperature for the Year 2000-2010

temperature is 29.7°c in August and minimum average monthly temperature is 20.3°c in January in 2010. The monsoon starts from June and maximum rainfall is experienced from July to September. Figure 12.8 present the temperature level (2000-2010) to convey the circumstances more obviously.

12.5.4.4 Humidity

The weather of Kalapara Planning area is not more contradictory from the natural weather of Bangladesh. But due to coastal region, weather of this area has few special characteristics. The humidity is comparatively high in the coastal region rather than other districts of Bangladesh. Fig 12.9 shows the monthly average humidity of Kalapara Paurashava.

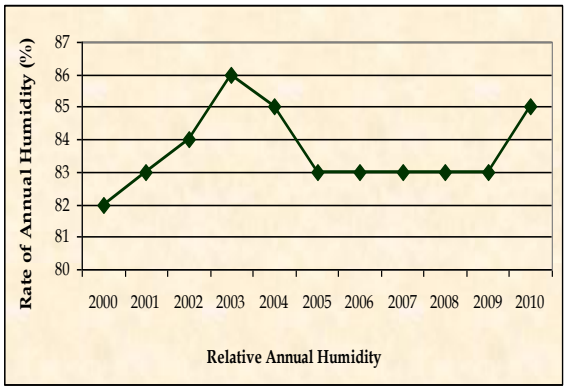

Figure 12.9: Monthly Average Humidity (%) for the Year 2000-2010

12.5.4.5 Rainfall

The monsoon starts from June and maximum rainfall is experienced in 2007and lowest in 2010. Annual rainfall as recorded from 2000 to 2010, the maximum was 250.47 mm in 2004 and lowest in 2010 about 61.73 mm. It is recorded that during June to October there are high volume of rainfall.

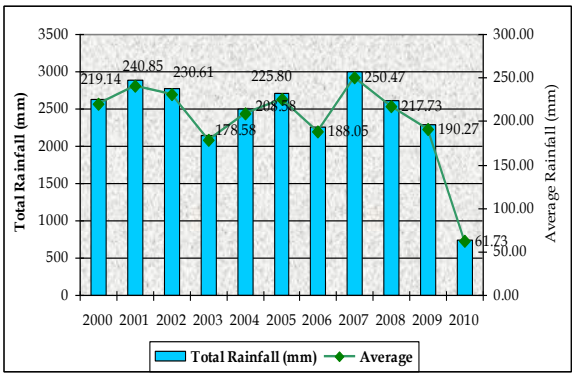

Figure 12.10 shows mean annual rainfall

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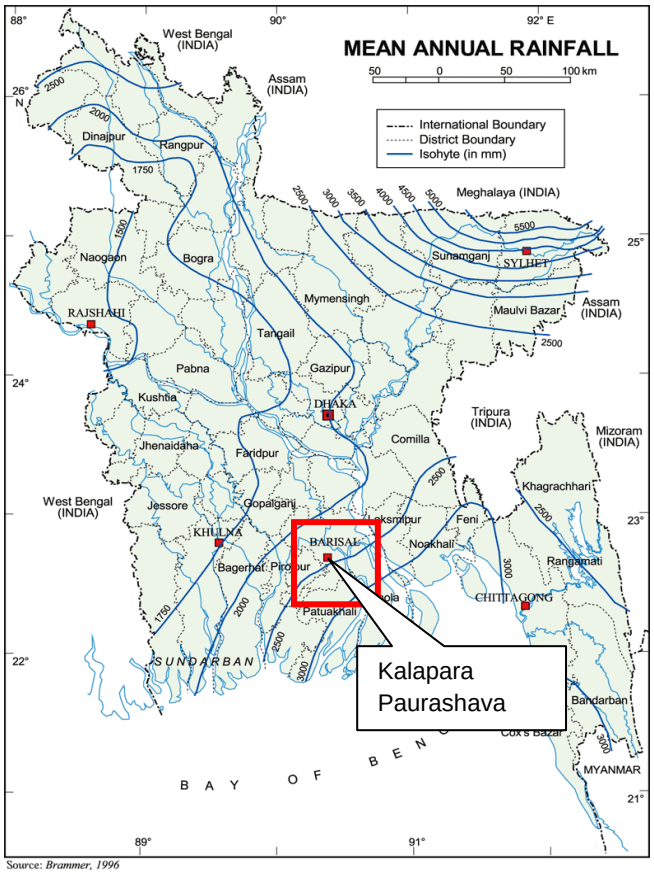
12.5.4.6 Wind Directions

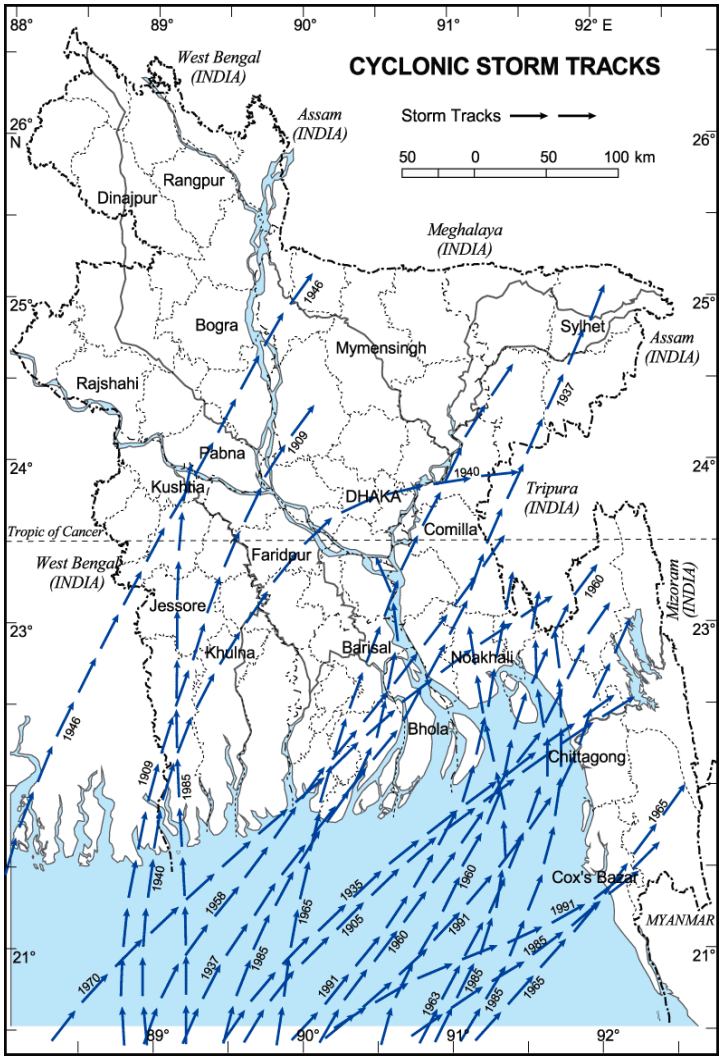
The general direction of the wind is the same as that in the Gangetic Delta: south-west, changing to east for the greater part of the year, with a north and north-west direction during the months of April and May. Nor-wasters are caused by outbreaks of cold air from Central Asia which enters Bangladesh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

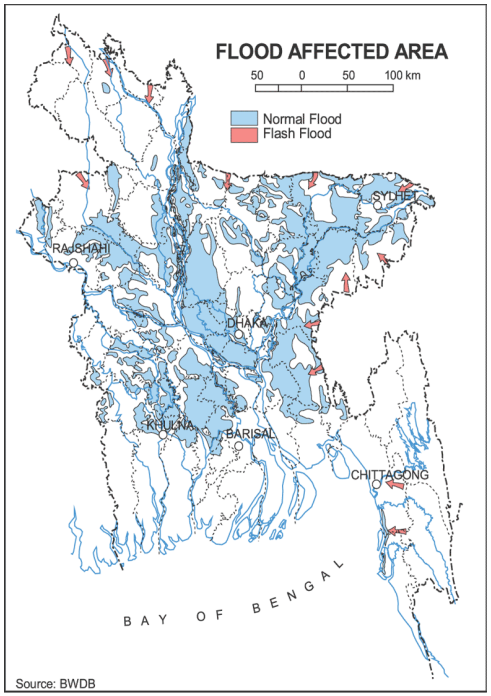
More specifically Monthly Prevailing Wind speed in knots and direction of Kalapara Planning area for the years of 1977 to 2007 has been presented below in Figure 7.5. It shows that wind direction in is mainly towards south and most of the time wind is calm (42.9 %) which is followed by 1-2.5 m/s wind speed (38.5%) and 2.5-5 m/s wind speed (14.4%).



Source: Bangladesh Metrological Department

Figure 12.9: Mean Annual Rainfall in Bangladesh





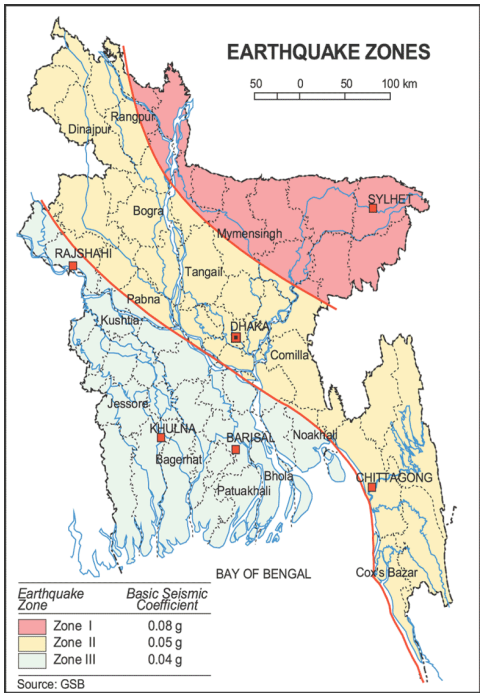


Figure 12.11: Cyclone, Flood and Earthquake Condition in Kalapara

Kalapara Paurashanva is mainly affected by the cyclone storm and comparatively less vulnerable for flood and earthquake as it is geographically positioned in the coastal belt of Bangladesh.

12.5.4.7 Hydrology

Hydrology can be defined as the scientific study of the waters of the earth, especially with relation to the effects of precipitation and evaporation upon the occurrence and character of water in streams, lakes, and on or below the land surface. The hydrological condition of Kalapara Planning area is getting of inferior quality day by day.

12.5.5 Solid Waste and Garbage Disposal

Condition of solid waste management at Kalapara Paurashava is very poor. According to the opinion of surveyed households, there is no dustbin at Kalapara Paurashava. Most of the people throw their garbage here and there and especially dump to the river, canal and khal which cause serious environmental pollution and also sometimes clogged the existing drainage network. From the field survey it is also found that there is no clinical waste management system.

House Hold Waste

According to the opinion of surveyed households, there is no dustbin at Kalapara Paurashava. Most of the people throw their garbage here and there and specially dump to the canal and khal which cause environmental pollution and also sometimes clogged the existing drainage network. From the field survey it is also found that there is no clinical waste management system.

Industrial Waste

There is no severe environmental pollution generating industrial unit situated within and/or nearby Kalapara Paurashava area. 22 saw mills, 13 rice mills, ice factories, and 12 cow firm are situated in Kalapara Paurashava area.

Kitchen Market Waste

At present there is no dustbin at Kalapara Paurashava to collect kitchen market wastes. Generally people throw their garbage here and there which cause environmental pollution and also sometimes clogged the existing drainage network.

Existing Waste Management System

At present, there is no solid waste management system at Kalapara Paurashava. Most of the people threw garbage here and there, which causes serious environmental pollution and also sometimes clogged the existing drainage network.

12.5.6 Pollutions

Water Pollutions

Water pollution is one of the major phenomenon in Kalapara Paurashava. Many causes have been identified for surface water pollution. Maximum surface water are polluted by domestic source and chemical fertilizer used in agriculture field. However, as the area is in coastal region, saline and iron have been contaminated the water. Marine vehicles are also responsible for water pollution of rivers and khals.

Sound Pollution

Noise pollution is a minor phenomenon in Kalapara Paurashava. However such type of pollution problem is occurring by the road vehicles. But it has been identified that this is not a major problem for all over the area. It is a problem for some particular road side areas.

Land Pollution

Land pollution is not found as problem in Kalapara Paurashava.

Air Pollution

The households of Kalapara Paurashava face the little problem of air pollution. There are fourteen mills inside the Kalapara Paurashava. These mills have been identified as main source of air

pollution. No treatment plant is available in the Paurashava. A number of heavy vehicles (Highway bus and truck) move through the road and extract some pollutant particle that also causes air pollution.

Arsenic

There is no arsenic pollution so far has been identified by various study to the ground water of Kalapara paurashava.

12.5.7 Natural Calamities and Localized Hazards

Water Logging

Another undesirable phenomenon is water logging. It refers to as both man-made and natural. Ground may be regarded as waterlogged when the water table of the ground water is too high to conveniently permit an anticipated activity. Poor drainage system is one of the most important causes of water logging in the study area. There is no fixed location where water logged frequently. Most of the areas suffer water logging during heavy rainfall.

Flood

Flood is not common natural disaster at Kalapara Paurashava. Naturally floods are occurring in every rainy season but it not stay for more time. Sometimes it overflows the embankment and causes many losses of property and lives. During flood low lying settlements are mainly affected. Fig 12.11 shows flood situation in Kalapara.

Cyclone

Cyclone is most common disaster at Kalapara Paurashava. Every year Kalapara Paurashava is affected by cyclone. Among them the identifiable disaster was cyclone SIDR in 2007 and Aila in 2009. The disaster SIDR and Aila were a big hazard for their natural climatic condition. It also damages many lives, forests, agricultures and infrastructures. For the help of cyclone affected peoples and livestock during and after cyclone there are cyclone centers at Kalapara Paurashava. Mainly primary schools are serving as cyclone centers. Fig 12.11shows the cyclone affected year of Kalapara Paurashava

Earthquake

Earthquake is a natural hazard and the southern area of Bangladesh is not so vulnerable. So, Kalapara Paurashava is not vulnerable for earthquake. Fig 12.11 shows that Kalapara is not situated in the vulnerable zone of earthquake.

Fire Hazard

The residents of Kalapara Paurashava do not normally face the problem of fire.

Land Filling

Land filling creates problem in natural runoff and drainage system. The soil removed by runoff from the land accumulates below the eroded areas, in severe cases blocking roadways or drainage channels and inundating buildings.

Encroachment

Amount of land encroachment at Kalapara is very little but land encroachment by the side of the canals interrupts the natural drainage system. This may be responsible for the inundation of the Paurashava.

12.6 Plans for Environmental Management and Pollution Control

12.6.1 Proposals for Environmental Issues

12.6.1.1 Solid Waste Management Plan

No waste collection system is available in Kalapara Paurashava to handle / manage household/ kitchen market/clinical waste. Most of the people throw their garbage here and there and especially dump to canal and khal which environmental pollution and also sometimes clogged the existing drainage network. Although at present, environmental pollution due to solid waste not a serious problem on Kalapara Paurashava. Good solid waste management practice should be implemented for better environment at Kalapara Paurashava. To fulfill that aim some proposals and suggestions are recommended as Solid Waste Management Plan. Detail land use proposals related to Solid Waste Management is given in **Table 10.13 in Chapter 10 of Part B** of this report.

Criteria for Selection of Solid Waste Dumping Site

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

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

12.6.1.2 Open Space, Wet-land and Relevant Features Protection Plan

The river Andharmanik is a great asset of Kalapara that plays multifaceted role for the town. It could be a navigation route to some extent, a source of water and also a source of recreation. Detail land use information related to proposal for Open spaces is given in **Table 10.08 in Chapter 10 of Part B** of this report.

Mitigation Measures:

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

Loss of Wetlands

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

Mitigation Measures:

- Designate all ponds in Master Plan Map and protect the large ones according to the ecological importance and public interest.
- Protect the ponds as per regulatory framework of Master Plan.
- Avoiding wetlands during road alignment fixation.
- Stopping housing, industries and other development works in wetlands through earth filling.
- Stopping earth filling of ponds in the area through creation of public awareness.
- Strict implementation of Wetland Conversation Act, 2000.
- Strict implementation of Environment Conversation Act(ECA), 1885
- Create new laws if existing one fails to stop land filling of ponds.

12.6.1.3 Ground Water Pollution

Though ground water is not a major source of drinking water supply in the study area, yet ground water pollution by salinity and arsenic is a serious problem for future water supply. It is reported that over 90% of the tube wells are affected by arsenic which is a major threat to health for those who use ground water for drinking purpose. Arsenic is geological problem. But experts view that it arises due excessive extraction of ground water. So in future, when population rises further excessive ground water extraction will aggravate contamination situation.

Mitigation Measures:

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

12.6.1.4 Surface Water Pollution

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

Mitigation Measures:

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

12.6.2 Natural Calamities and Regular Hazard Mitigation Proposals

12.6.2.1 Cyclone

Cyclone is a regular natural calamity in the study area. It affects the poor people mostly who cannot build houses with permanent materials. Cyclones also destroy trees and other establishments causing economic losses. It is not possible to prevent cyclones, but it is possible to reduce the losses by cyclones.

Mitigation Measures:

- Construction of cyclone shelter in coastal area.
- Provide housing loan to build houses with permanent materials.
- Take measures to promote employment and reduce poverty.
- Take appropriate measures for post disaster loss mitigation.

12.6.2.2 Flood Protection

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

Enhancement Activities:

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

Responsible Organizations: BWDB and Paurashava

12.6.2.3 Earthquake

Although Kalapara is not Earthquake prone area, however unplanned and unregulated urbanization and disregard to BNBC rules in building construction may cause it vulnerable in future. With the implementation of SMP the planned urbanization will strictly follow the actual zoning plan and following of BNBC rule will minimize the earthquake damage. In DMDP Urban Area Plan Volume-II, (Part-3, Interim Planning Rules) development restriction considering the geological fault line areas states **"**Structures above 2 storeys situated within 500 meters of a geological fault is not allowed unless built to the BNBC standards for Seismic Zone 3 (BNBC Section 6 Chapter 2.25)"**.**

Enhancement Activities:

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

Responsible Organizations: Paurashava, MOFDM, Civil Defense, Fire Service and DO

12.6.2.4 Fire Hazard

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

Mitigation Measures:

- Set up modern fire extinguishing devises.
- Discourage people from using low quality electrical wire in building and industries.
- Ensure periodical checking of electrical lines.
- Advise low income dwellers about cooking safety.
- Create awareness among people about the dangers of fire hazard.

12.6.2.5 Protection Plan Addressing Encroachment and Other Relevant Issues

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

Mitigation Measures:

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

Responsible Organizations: Paurashava, DOE and Forest Department

12.7 Plan Implementation Strategies

12.7.1 Regulations to Implement the Environment Management Plan

Related rules and regulations for urban environment management to protect environment for sustainable urban development:

1. **Local Government (Paurashava) Act 2009**, Paurashava's responsibility to concern solid wastes and sustainable development.

2. **Environmental Conservation Act 1995**, to concern water quality, air quality, noise abatement and solid wastes etc. The Department of Environment is the law enforcing organization.

3. **Environmental Conservation Rules 1997,** to concern water quality, air quality, noise abatement and solid wastes etc. The Department of Environment is the law enforcing organization.
4. **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.
5. **Conservation of Environment Act, 1995** have prescribed duties and responsibilities of the Director. Most of those responsibilities are on the control of pollution.
6. **Playfield, Open space, Park and Natural Water Reservoir Conservation Act, 2000** will be needed for the preservation of playfield, garden, open space and natural tank of the Paurashava.
7. **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.

12.7.2 Plan Implementation Strategy

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. Firstly, 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:

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 layout 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 program 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 ongoing and implemented projects is essential to keep the future course of action on the right track. An ongoing 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

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. In this way it will be possible to ensure governance at Paurashava level. 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

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.

13.2 Consideration for the Preparation of Urban Service

- Specify whether the urban service will be provided in the future by a city, county, district, authority or a combination of one or more cities, counties, districts or authorities.
- Set forth the functional role of each service provider in the future provision of the urban service.
- Determine the future service area for each provider of the urban service.
- Assign responsibilities for:
    - Planning and coordinating provision of the urban service with other urban services;
    - Planning, constructing and maintaining service facilities; and
    - Managing and administering provision of services to urban users.

13.3 Range and Content of the Urban Service

The Plan for Urban Services covers planning area of Kalapara Paurashava for ten years' time-frame (from 2011 to 2021). It also comprises with report and maps.

The Plan in concerned 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 projection.

Outline of the Plan gives guidance to the Paurashava how the urban services will be developed and be promoted, maintained with a coordinated manner.

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

13.3.1 Water Supply

According to BBS, it has been observed that about 0.2% households of Kalapara Paurashava is connected to Paurashava supplied water supply system whereas about 77.4% households use well as a source of drinking water. Additionally, about 19.9% households have tube-well and the rest of the households use pond water for their drinking purpose.

It is proposed to install a network based water supply system by using fresh water from the Andharmanik River for the entire Paurashava after treatment. And water supply lines in this Paurashava will be established along all categories of roads as per the growth of the settlement.

13.3.2 Solid Waste

There will be 9 waste transfer stations with an area of 1.13 acres for collection of solid waste located at suitable locations. A dumping site will be developed over an area of 6.32 acres for final disposal of the solid waste. The waste dumping site is located in Ward no. 01 at the north-west corner boundary of the Paurashava. Details have been given in **Table10.13, Chapter 10, Landuse Plan, Part-B.**

13.3.3 Telecommunication

The town enjoys the networks of all mobile companies operating in the country. Due to easy and cheaper access to mobile, there is actually no demand for BTCL network.

13.3.4 Sanitation

The BBS data shows that about 73.9% of the households have sanitary toilet whereas about 11.3 % households have no toilet facilities. Furthermore, about 14.9% of the households have other type of toilet facilities such as kutcha toilet, hanging toilet, etc.

The socio-economic survey results indicate that about 63.0% of the toilets are Pucca, 17.9 % Kutcha and the rest 19.1% have no toilet facility. However, the condition of toilet facilities in Ward no. 1, 2, 3, 4 and 6 there is about 60% coverage of sanitary facilities.

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

13.4 Regulations to Address the Proposals

Local Government (Paurashava) Act, 2009 (Act No. XLXVIII of 2009)

According to the 2nd Schedule, Sl. No. 10, the Paurashava may provide supply of 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 will be dug, constructed or provided except with the sanction of the Paurashava.

The regulations, as discussed above, will be needed for provision of drinking water supply both Paurashava and private sources in the Paurashava.

The sewerage facilities may be provided by the Paurashava and Department of Public Health Engineering (DPHE). According to the 2nd Schedule, Sl. No. 12, of the Local Government (Paurashava) Act, 2009, Paurashava 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)

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.

The Department of Public Health Engineering (DPHE) is performing activities for drinking water supply. At Paurashava level 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)

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)

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.

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13.5 Implementation, Monitoring and Evaluation

Regulations to Address the Proposals

Local Government (Paurashava) Act, 2009 (Act No. XLXVIII of 2009) was enacted in 6thOctober 2009. According to the 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.

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Public Health (Emergency Provisions) Ordinance, 1944 (Ordinance No. XXI of 1944) was enacted in 20thMay 1944. According to the section 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.

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Implementation, Monitoring and Evaluation of the Urban Services Plan

Implementation through Multi-Sectoral Investment Program: 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 Program (MSIP).

Objective of a Multi-Sectoral Investment Program (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.

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 program components of the Urban Services Plan appropriate administrative measures will have to be undertaken. This will essentially include project

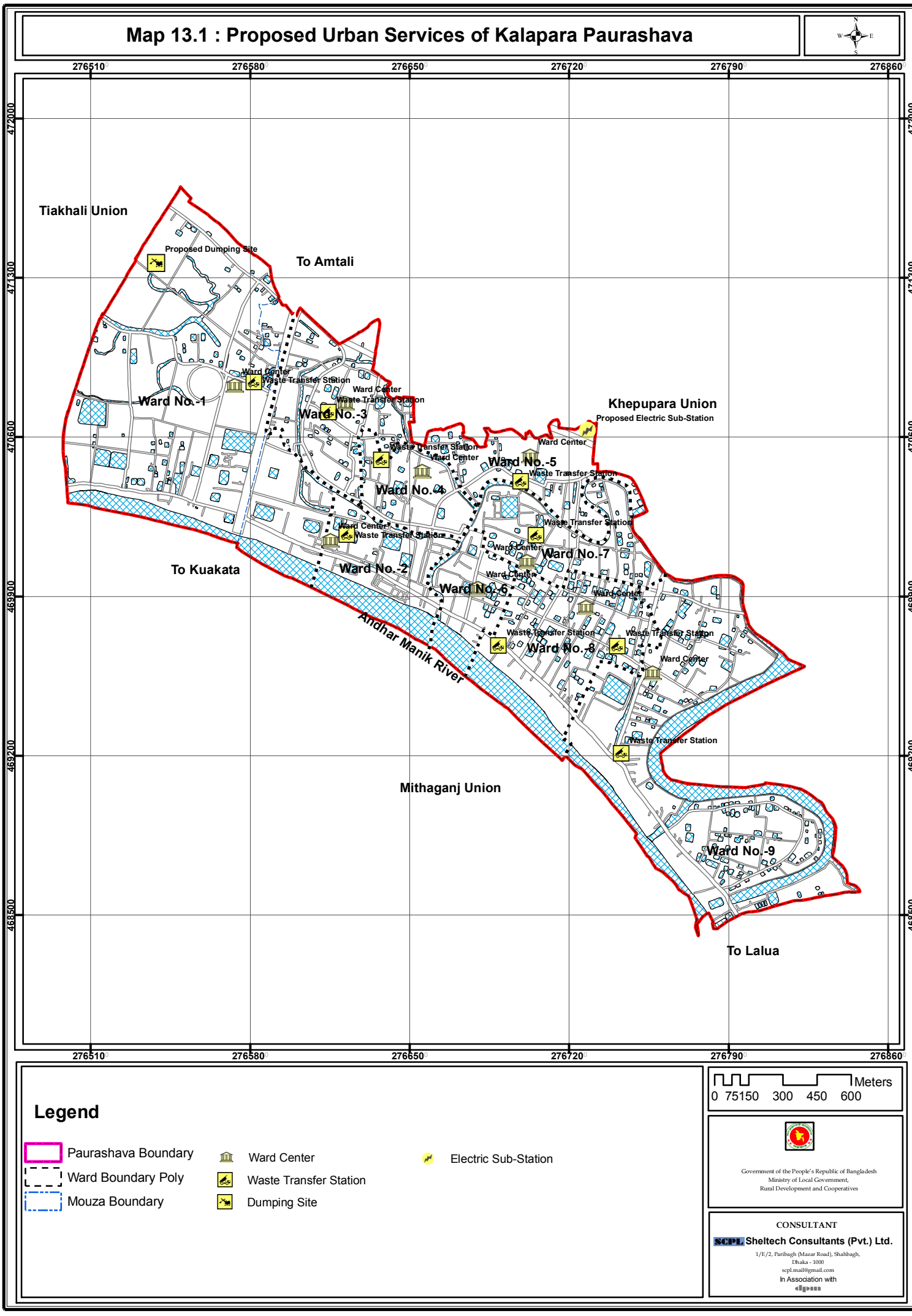
preparation and monitoring of their execution and evaluation. For carrying out all these activities appropriate institutional measures are also be needed.

Evaluation

Monitoring and evaluation of ongoing and implemented projects is essential to keep the future course of action on the right track. An ongoing 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.

Map 13.1 : Proposed Urban Services of Kalapara Paurashava



Part C. Ward Action Plan

CHAPTER 14
WARD ACTION PLAN

14.1 Introduction

This chapter contains Ward Action Plan of each individual Ward. First, the issues prevailing in different Wards have been briefly described followed by description of Development Proposals in first ward action plan (1st to 5th year of planning period) for each Ward.

14.1.1 Background

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

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

14.1.2 Content and Form of Ward Action Plan

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

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

14.1.3 Linkage with Structure and Urban Area Plan

Ward Action Plan is the 3rd component of the Master Plan package. The other two upper level components are Structure Plan and Urban Area Plan. Structure Plan lay 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.

14.2 Derivation of Ward Action Plan

The Ward Action Plan is derived from the conceptual framework, and guidelines and strategies for development under Structure Plan and detailed proposals of Urban Area Plan. Ward Action Plan is aimed to provide detailed infrastructure plan to guide the physical development of Kalapara town including its all economic and social activities. This plan adheres to the policy directives spelled out in the Structure Plan.

14.2.1 Revisiting Structure Plan and Urban Area Plan

To guide long term growth of the Paurashava, potential locations of major development areas are identified and the Structure Plan Area is broadly classified into nine categories, namely

Established Urban Area, Sub Urban Area, New Urban Area, Recreational Facility, Circulation Network, Restricted Area, Urban Peripheral Area, Agriculture Area and Water Retention Area. The Urban Area Plan is prepared under the framework of Structure Plan and the infrastructure identified for improvement and development are listed as proposals in the Urban Area Plan. The broad classification of lands in the Structure Plan and detailed proposals in the Urban Area Plan form the basis for Ward Action Plan.

14.2.2 Prioritization

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

14.2.3 Ward Wise Action Plan

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

14.3 Ward Action Plan for Ward No. 01

14.3.1 Demography

Ward No.1 is located on the western part of the Paurashava. It has least density of population. Population projection shows 5710 population for the year 2031. For the same year, it will be 19 persons per acre in 2031. Table 14.1 shows the detail.

Table 14.1: Population Statistics of Ward No. 01

Item	Year			
	2016	2021	2026	2031
Area (acre)	297.66	297.66	297.66	297.66
Population	3801	4353	4986	5710
Density of Population (acre)	13	15	17	19

14.3.2 Ward Action Plan Proposals

14.3.2.1 Review of Existing Land Use

Out of total 297.66 acres of land of this ward, more than 82 acres of land i.e. 27.73% is used in residential. The agricultural use with 122.71 acres, occupies 41.22% of total land, water bodies 16.53%, commercial use 0.99%, open space 4.13% and circulation network 2.46%. Only 1.35% of land is used as education facilities.

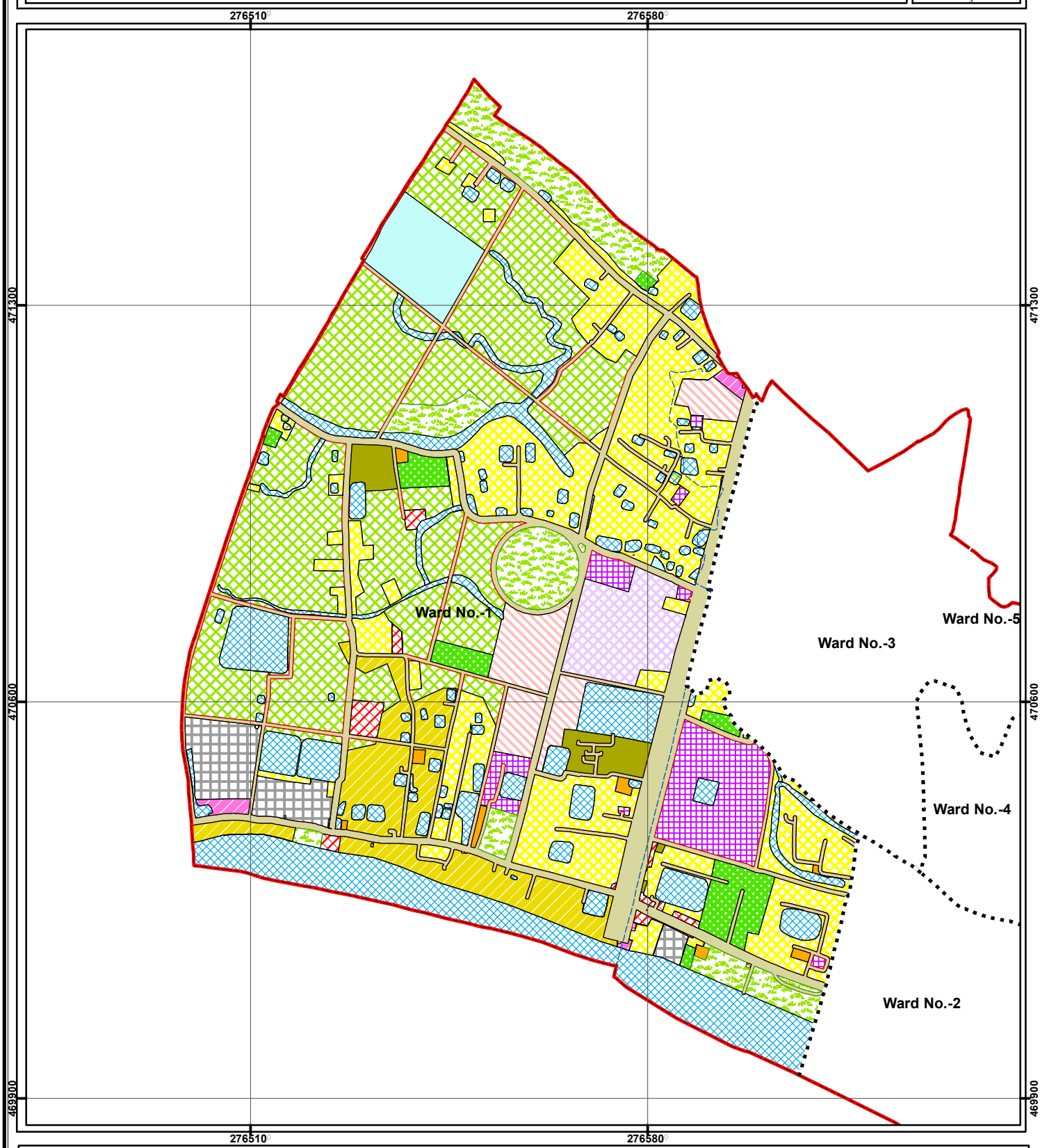
14.3.2.2 Proposed Land Use Zoning

The category wise proposals are presented here. Table 14.2 shows the amount of land existing and proposed uses in Ward no. 1. **Map 14.1** shows proposed land use of Ward 01. Table 14.2 shows the detail.

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

Sl. No.	Landuse (Existing)	Area (Acre)	%	Sl. No.	Landuse (Proposed)	Area (Acre)	%
1	Administrative	11.75	3.95	1	Administrative	11.24	3.78
2	Agriculture	122.71	41.22	2	Agriculture	72.85	24.47
3	Circulation Network	7.33	2.46	3	Circulation Network	36.89	12.39
4	Commercial Activity	2.93	0.99	4	Commercial Activity	2.05	0.69
5	Community Facility	1.44	0.48	5	Community Facility	0.94	0.32
6	Education & Research	4.02	1.35	6	Education & Research	6.35	2.13
7	Health Facility	2.02	0.68	7	Health Facility	3.66	1.23
8	Industrial	1.33	0.45	8	Industrial	6.63	2.23
9	Open Space	12.30	4.13	9	Open Space	17.62	5.92
10	Residential	82.54	27.73	10	Recreational Facility	0	0
11	Transportation & Communication	0.09	0.03	11	Transportation & Communication	1.41	0.47
12	Waterbody	49.19	16.53		Urban Residential	53.56	17.98
				12	Rural Settlement	14.98	5.03
					Mixed	8.92	3.00
					Urban Deffered	7.68	2.58
				13	Utility Service	6.41	2.15
				14	Waterbody	46.58	15.64
	Total	**297.66**	**100**		**Total**	**297.77**	**100**

Map 14.1 : Landuse Plan of Ward no. 1



Legend

- Paurashava Boundary
- Ward Boundary Poly
- Mouza Boundary

- Administrative
- Agriculture
- Circulation Network
- Commercial Activity
- Community Facility
- Education & Research
- Health Facility
- Industrial
- Mixed Use
- Open Space
- Recreational Facilities
- Rural Settlement
- Transportation Facilities
- Urban Deferred
- Urban Settlement
- Utility Facility
- Waterbody

0 35 70 140 210 280 Meters

Local Government Engineering Department (LGED)
Government of the People's Republic of Bangladesh
Ministry of Local Government,
Rural Development and Cooperatives

CONSULTANT
SCPL Sheltech Consultants (Pvt.) Ltd.
1/E/2, Paribagh (Mazar Road), Shahbagh,
Dhaka - 1000
scpl.mail@gmail.com
In Association with

a. Residential Zone

In land uses, the urban residential has been considered as residential use as a whole. In Ward Action Plan, more than 68.53 acre of land has been earmarked for urban residential use which will occupy 23.02% of the total land.

b. Circulation Network

For any type of development, circulation network is an important facility. To improve the efficiency of transport network of the ward, more roads are proposed which will consume almost 36.89 acres of land and more than 12.39% of the total area.

c. Administrative Area

3.78% land has been allocated for administrative purpose. Ward center/Ward councilor's office has been proposed in this ward.

d. Commercial Activity

At present, commercial activity and density of population are moderate in this ward. Only 2.05 acres of land has been proposed for this purpose which will occupy only 0.69 % of total land. Additionally, other commercial functions are provided at mixed use zone, along with administrative and community facilities for this ward.

e. Education and Research

In Ward Action Plan, 2.13% of total land has been allocated for education.

f. Health Facilities

1.23% land has been allocated for health purpose. A health center has been proposed in this purpose.

g. Community Facilities

Land for community facilities will be 0.94 acre which is 0.32 %.

h. Utility Service

A total of 6.41 acre of land covering 2.15% of total land is earmarked as Utility Services zone at Ward no. 01. Proposal is made for the establishment of one waste disposal site and one waste transfer station in this zone.

i. Transport and Communication

It occupies 1.41 acres land which is 0.47% total land of the ward

j. Industrial Activity

A total 6.63 acre land has been allocated in this purpose.

k. Recreational Facilities

No land is proposed for this purpose.

l. Open Space

Land for Open space will be 17.62 acre which includes open recreational facilities Stadium and Local Park.

m. Agricultural Area

The Paurashava including Ward No. 01 has a vast area of agricultural land that demands formation of a separate zone like, agriculture zone. The total area under this use has been

remained as about 72.85 acres of land covering 24.47% of the total land. Rural homestead will also perform some agricultural activities as farm, poultry or horticulture.

n. Water bodies

The plan suggests for preserving most of the water bodies for two purposes, first, to serve as source of water, second to serve as water retention area during monsoon. The ponds will be preserved as the water retention ponds. The proposed retention area covers 46.58 acres of land which covers almost 15.64% of the total ward area.

o. Urban Deferred

For the purpose, 7.68 acres of land is proposed for the development of the town in future. It covers almost 2.58% of the whole ward.

14.3.2.3 Proposed Road Infrastructure Development

A total of 18.29 km of road development has been proposed in Ward no. 01 of Kalapara Paurashava. Length of the tertiary road will be 8.54 km and width of these roads will be 20ft. Total length of secondary road will be 6.08 km and width will be 40 ft for this ward. The rest 1.01 km primary road will be developed and its width will be 60 ft and 150 ft. The detailed scenario of road network development proposal is given in Table 14.3.

Table 14.3: Road Network Proposal at Ward no. 01

Proposed Road ID	Type	Remark	Existing Width (ft)	Proposed Width (ft)	Length in (m)	Phase
PR-1	Primary Road	Extended	24	150	640.85	1st Phase
PR-4	Primary Road	Extended	16	60	377.88	1st Phase
				Sub-Total	**1018.73**	
SR-1	Secondary Road	Extended	12	40	794.71	1st Phase
SR-2	Secondary Road	Extended	10	40	372.89	1st Phase
SR-10	Secondary Road	Extended	6	40	369.19	1st Phase
SR-12	Secondary Road	New	0	40	324.45	2nd Phase
SR-14	Secondary Road	New	0	40	487.85	2nd Phase
SR-15	Secondary Road	Extended	6	40	170.76	2nd Phase
SR-16	Secondary Road	Extended	6	40	412.87	2nd Phase
SR-17	Secondary Road	New	0	40	432.91	2nd Phase
SR-19	Secondary Road	Extended	10	40	146.10	2nd Phase
SR-21	Secondary Road	Extended	6	40	315.90	2nd Phase
SR-22	Secondary Road	Extended	6	40	537.25	2nd Phase
SR-23	Secondary Road	New	0	40	659.52	2nd Phase
SR-24	Secondary Road	New	0	40	1055.30	2nd Phase
				Sub-Total	**6079.7**	
TR-5	Tertiary Road	Extended	6	20	32.49	2nd Phase
TR-6	Tertiary Road	Extended	6	20	117.01	2nd Phase
TR-7	Tertiary Road	Extended	6	20	17.64	2nd Phase
TR-8	Tertiary Road	Extended	6	20	18.07	2nd Phase
TR-9	Tertiary Road	Extended	6	20	25.45	2nd Phase
TR-10	Tertiary Road	Extended	6	20	831.40	2nd Phase
TR-11	Tertiary Road	Extended	6	20	49.55	2nd Phase
TR-12	Tertiary Road	Extended	6	20	156.47	2nd Phase
TR-13	Tertiary Road	Extended	6	20	21.15	2nd Phase
TR-14	Tertiary Road	Extended	6	20	106.81	2nd Phase
TR-15	Tertiary Road	Extended	6	20	9.25	2nd Phase
TR-16	Tertiary Road	Extended	6	20	53.04	2nd Phase
TR-17	Tertiary Road	Extended	6	20	33.88	2nd Phase
TR-18	Tertiary Road	Extended	6	20	125.29	2nd Phase
TR-19	Tertiary Road	Extended	6	20	394.79	2nd Phase
TR-20	Tertiary Road	Extended	8	20	744.61	2nd Phase
TR-21	Tertiary Road	Extended	6	20	324.67	2nd Phase
TR-22	Tertiary Road	Extended	6	20	80.37	2nd Phase

Proposed Road ID	Type	Remark	Existing Width (ft)	Proposed Width (ft)	Length in (m)	Phase
TR-23	Tertiary Road	Extended	6	20	44.06	2nd Phase
TR-24	Tertiary Road	Extended	6	20	198.36	2nd Phase
TR-25	Tertiary Road	Extended	8	20	299.04	2nd Phase
TR-26	Tertiary Road	Extended	8	20	165.26	2nd Phase
TR-27	Tertiary Road	Extended	6	20	18.06	2nd Phase
TR-28	Tertiary Road	Extended	6	20	15.50	2nd Phase
TR-29	Tertiary Road	Extended	6	20	47.28	2nd Phase
TR-30	Tertiary Road	Extended	6	20	29.42	2nd Phase
TR-31	Tertiary Road	Extended	6	20	156.41	2nd Phase
TR-32	Tertiary Road	Extended	6	20	88.16	2nd Phase
TR-33	Tertiary Road	Extended	8	20	453.47	2nd Phase
TR-40	Tertiary Road	Extended	6	20	2.48	2nd Phase
TR-41	Tertiary Road	Extended	6	20	3.17	2nd Phase
TR-42	Tertiary Road	Extended	4	20	238.70	2nd Phase
TR-43	Tertiary Road	Extended	6	20	283.78	2nd Phase
TR-47	Tertiary Road	Extended	8	20	101.05	2nd Phase
TR-48	Tertiary Road	Extended	8	20	112.38	2nd Phase
TR-49	Tertiary Road	Extended	12	20	50.04	2nd Phase
TR-50	Tertiary Road	Extended	10	20	114.98	2nd Phase
TR-51	Tertiary Road	Extended	6	20	152.65	2nd Phase
TR-257	Tertiary Road	Extended	6	20	46.55	3rd Phase
TR-258	Tertiary Road	Extended	6	20	39.74	3rd Phase
TR-259	Tertiary Road	Extended	6	20	5.11	3rd Phase
TR-260	Tertiary Road	Extended	6	20	4.95	3rd Phase
TR-261	Tertiary Road	Extended	6	20	9.37	3rd Phase
TR-262	Tertiary Road	Extended	6	20	19.61	3rd Phase
TR-263	Tertiary Road	Extended	6	20	21.14	3rd Phase
TR-264	Tertiary Road	Extended	6	20	18.09	3rd Phase
TR-271	Tertiary Road	Extended	6	20	52.65	3rd Phase
TR-272	Tertiary Road	Extended	8	20	21.36	3rd Phase
TR-273	Tertiary Road	Extended	16	20	30.05	3rd Phase
TR-274	Tertiary Road	Extended	6	20	2.22	3rd Phase
TR-275	Tertiary Road	Extended	6	20	15.96	3rd Phase
TR-278	Tertiary Road	Extended	8	20	62.12	3rd Phase
TR-279	Tertiary Road	Extended	6	20	33.80	3rd Phase
TR-280	Tertiary Road	Extended	6	20	117.20	3rd Phase
TR-286	Tertiary Road	Extended	4	20	132.21	3rd Phase
TR-289	Tertiary Road	Extended	10	20	1.04	3rd Phase
TR-305	Tertiary Road	New	0	20	516.13	3rd Phase
TR-306	Tertiary Road	Extended	6	20	2.04	3rd Phase
TR-307	Tertiary Road	Extended	6	20	0.38	3rd Phase
TR-308	Tertiary Road	Extended	6	20	119.76	3rd Phase
TR-309	Tertiary Road	Extended	6	20	0.55	3rd Phase
TR-310	Tertiary Road	New	0	20	271.38	3rd Phase
TR-317	Tertiary Road	New	0	20	277.04	3rd Phase
TR-318	Tertiary Road	New	0	20	225.73	3rd Phase
TR-320	Tertiary Road	New	0	20	142.94	3rd Phase
TR-321	Tertiary Road	New	0	20	468.84	3rd Phase
TR-259	Tertiary Road	Extended	6	20	41.44	3rd Phase
TR-261	Tertiary Road	Extended	6	20	41.44	3rd Phase
TR-260	Tertiary Road	Extended	6	20	41.60	3rd Phase
TR-261	Tertiary Road	Extended	6	20	41.60	3rd Phase
				Sub-Total	**8540.23**	
				Grand Total	**18290.66**	

- “PR” for Primary Road, “SR” for Secondary Road and TR” for Tertiary Road

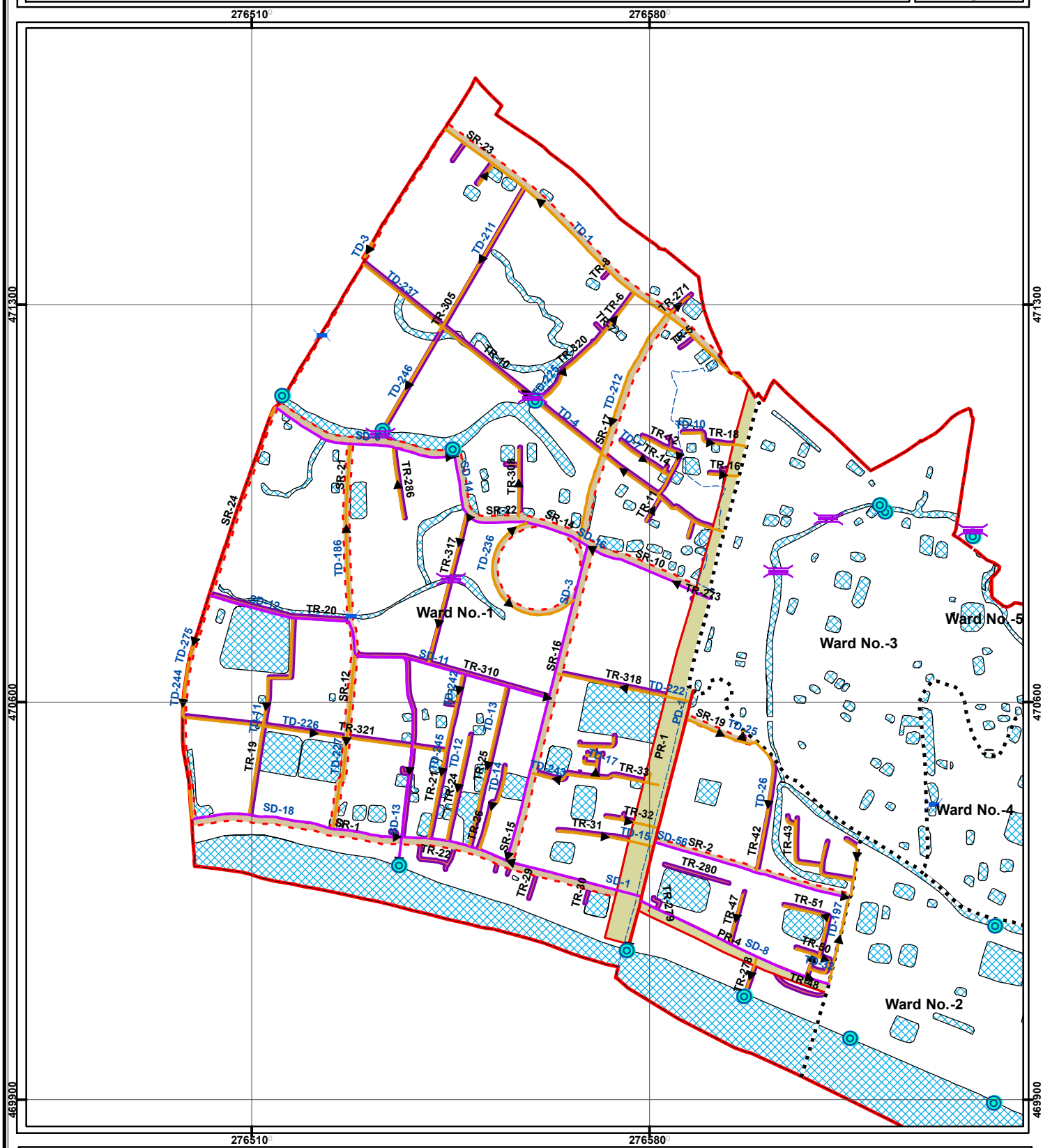
14.3.2.4 Drainage Development Plan

There is both natural and man-made drainage system at Ward no. 01. The existing drainage of the ward mainly depends on the natural drainage facilities. There is proposal for manmade drainage facilities in Ward Action Plan. The proposed drainage facilities will be developed based on these natural channels. Table 14.4 shows the details. **Map 14.2** represents the proposed road and drainage network for Kalapara Paurashava.

Table14.4: Drainage Development Plan Proposals for ward 01

Drain ID	Type	Width	Depth	Length (M)	Phasing
PD-1	Primary Drain	3.5-4.5	2.25-3.00	472.79	1st Phase
SD-1	Secondary Drain	2.5-3.5	1.25-2.25	438.07	1st Phase
SD-11	Secondary Drain	2.5-3.5	1.25-2.25	271.38	1st Phase
SD-12	Secondary Drain	2.5-3.5	1.25-2.25	604.86	1st Phase
SD-13	Secondary Drain	2.5-3.5	1.25-2.25	160.21	1st Phase
SD-14	Secondary Drain	2.5-3.5	1.25-2.25	104.27	1st Phase
SD-15	Secondary Drain	2.5-3.5	1.25-2.25	117.60	1st Phase
SD-16	Secondary Drain	2.5-3.5	1.25-2.25	285.39	1st Phase
SD-17	Secondary Drain	2.5-3.5	1.25-2.25	74.75	1st Phase
SD-18	Secondary Drain	2.5-3.5	1.25-2.25	373.40	1st Phase
SD-3	Secondary Drain	2.5-3.5	1.25-2.25	572.10	1st Phase
SD-56	Secondary Drain	2.5-3.5	1.25-2.25	356.16	2nd Phase
SD-6	Secondary Drain	2.5-3.5	1.25-2.25	335.72	1st Phase
SD-8	Secondary Drain	2.5-3.5	1.25-2.25	362.86	1st Phase
TD-1	Tertiary Drain	2-2.5	.64-1.25	679.86	2nd Phase
TD-10	Tertiary Drain	2-2.5	.64-1.25	127.36	2nd Phase
TD-11	Tertiary Drain	2-2.5	.64-1.25	386.02	2nd Phase
TD-12	Tertiary Drain	2-2.5	.64-1.25	188.41	2nd Phase
TD-13	Tertiary Drain	2-2.5	.64-1.25	290.12	2nd Phase
TD-14	Tertiary Drain	2-2.5	.64-1.25	157.21	2nd Phase
TD-15	Tertiary Drain	2-2.5	.64-1.25	173.18	2nd Phase
TD-16	Tertiary Drain	2-2.5	.64-1.25	104.94	2nd Phase
TD-17	Tertiary Drain	2-2.5	.64-1.25	365.26	2nd Phase
TD-177	Tertiary Drain	2-2.5	.64-1.25	46.55	3rd Phase
TD-185	Tertiary Drain	2-2.5	.64-1.25	52.65	3rd Phase
TD-186	Tertiary Drain	2-2.5	.64-1.25	299.51	3rd Phase
TD-188	Tertiary Drain	2-2.5	.64-1.25	20.56	3rd Phase
TD-191	Tertiary Drain	2-2.5	.64-1.25	72.04	3rd Phase
TD-195	Tertiary Drain	2-2.5	.64-1.25	132.21	3rd Phase
TD-197	Tertiary Drain	2-2.5	.64-1.25	147.70	3rd Phase
TD-2	Tertiary Drain	2-2.5	.64-1.25	117.01	2nd Phase
TD-211	Tertiary Drain	2-2.5	.64-1.25	293.54	3rd Phase
TD-212	Tertiary Drain	2-2.5	.64-1.25	432.91	3rd Phase
TD-213	Tertiary Drain	2-2.5	.64-1.25	0.38	3rd Phase
TD-214	Tertiary Drain	2-2.5	.64-1.25	119.76	3rd Phase
TD-221	Tertiary Drain	2-2.5	.64-1.25	146.35	3rd Phase
TD-222	Tertiary Drain	2-2.5	.64-1.25	239.68	3rd Phase
TD-225	Tertiary Drain	2-2.5	.64-1.25	142.94	3rd Phase
TD-226	Tertiary Drain	2-2.5	.64-1.25	467.64	3rd Phase
TD-227	Tertiary Drain	2-2.5	.64-1.25	314.13	3rd Phase
TD-236	Tertiary Drain	2-2.5	.64-1.25	250.53	3rd Phase
TD-237	Tertiary Drain	2-2.5	.64-1.25	372.52	3rd Phase
TD-241	Tertiary Drain	2-2.5	.64-1.25	112.17	3rd Phase
TD-242	Tertiary Drain	2-2.5	.64-1.25	57.86	3rd Phase
TD-243	Tertiary Drain	2-2.5	.64-1.25	88.21	3rd Phase
TD-244	Tertiary Drain	2-2.5	.64-1.25	152.48	3rd Phase
TD-245	Tertiary Drain	2-2.5	.64-1.25	237.06	3rd Phase
TD-246	Tertiary Drain	2-2.5	.64-1.25	181.47	3rd Phase
TD-25	Tertiary Drain	2-2.5	.64-1.25	133.34	2nd Phase
TD-26	Tertiary Drain	2-2.5	.64-1.25	244.02	2nd Phase
TD-27	Tertiary Drain	2-2.5	.64-1.25	368.52	2nd Phase

Map 14.2 : Road & Drainage Network for Ward no. 1



Legend

- Paurashava Boundary
- Ward Boundary Poly
- Mouza Boundary
- Proposed Outfall
- Bridge
- Culvert
- Proposed Bridge
- Primary Road
- Secondary Road
- Tertiary Road
- Walkway
- Primary Drain
- Secondary Drain
- Tertiary Drain
- Proposed Waterbody

0 35 70 140 210 280 Meters

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Dhaka - 1000
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In Association with

Drain ID	Type	Width	Depth	Length (M)	Phasing
TD-275	Tertiary Drain	2-2.5	.64-1.25	54.82	3rd Phase
TD-278	Tertiary Drain	2-2.5	.64-1.25	56.86	3rd Phase
TD-3	Tertiary Drain	2-2.5	.64-1.25	35.04	2nd Phase
TD-30	Tertiary Drain	2-2.5	.64-1.25	91.39	2nd Phase
TD-31	Tertiary Drain	2-2.5	.64-1.25	40.72	2nd Phase
TD-32	Tertiary Drain	2-2.5	.64-1.25	114.98	2nd Phase
TD-33	Tertiary Drain	2-2.5	.64-1.25	152.65	2nd Phase
TD-34	Tertiary Drain	2-2.5	.64-1.25	8.88	2nd Phase
TD-4	Tertiary Drain	2-2.5	.64-1.25	441.21	2nd Phase
TD-5	Tertiary Drain	2-2.5	.64-1.25	49.55	2nd Phase
TD-6	Tertiary Drain	2-2.5	.64-1.25	156.47	2nd Phase
TD-7	Tertiary Drain	2-2.5	.64-1.25	106.81	2nd Phase
TD-8	Tertiary Drain	2-2.5	.64-1.25	9.25	2nd Phase
TD-9	Tertiary Drain	2-2.5	.64-1.25	55.14	2nd Phase
			Total	**13619.43**	

Besides, it will be necessary to re-excavate all the encroached khals that serve as primary drains. The consultants have identified all existing khals that need to be re-excavated to allow smooth flow of water through them.

14.3.2.5 Urban Services

a. Solid Waste Management

Solid waste management is an important urban service. As density of population increases the volume of solid waste also increases proportionately. This ward will be developed as an industrial area. However, the income level is also another major factor influencing the volume of solid waste. Population and the volume of waste in the town are yet to be large enough to become a problem for it. But the present management system is not satisfactory and it might be led to problem in future. The consultant proposes one solid waste transfer station in this ward at on an area of 0.08 acre and a Waste Dumping Site on an area of 4.30 acres. It is recommended that home collection system is introduced in the ward by creation of local CBOs. This will cause organized collection of waste and prevent indiscriminate littering.

b. Water Supply

It is proposed to install a network based water supply system by exploring fresh water from the Andharmanik River for the entire Paurashava. And water supply lines in this ward will be established along all categories of roads as per the growth of the settlement.

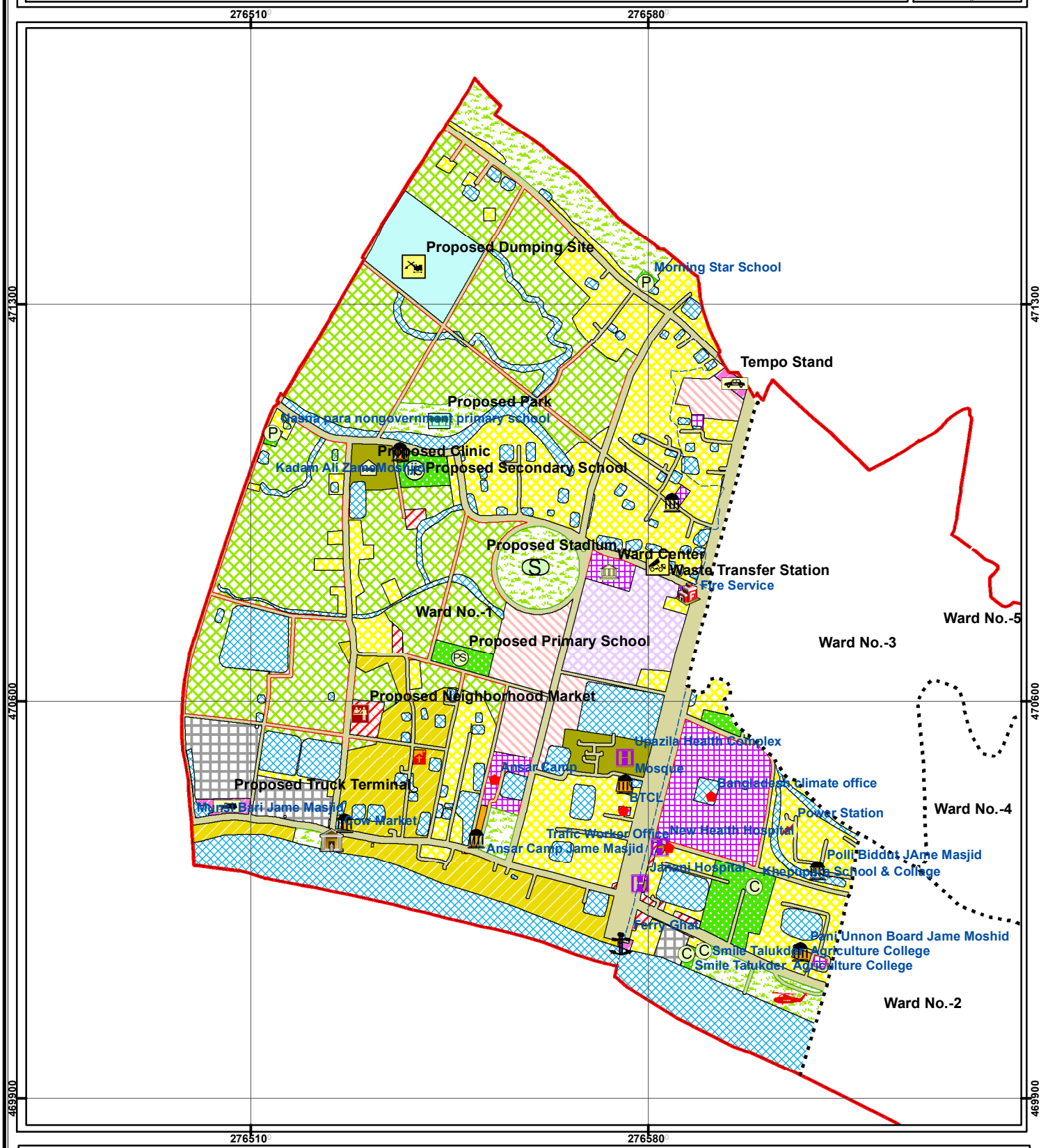
c. Sanitation

It is apprehended that the government would not be able to provide network and treatment based sanitation system for the town. So the present system of sanitation will continue. However, the Paurashava must try to promote hygienic sanitation to ensure better public health. There is hardly any public toilet in the town to serve the visitors and the local people. The existing toilet of bus terminal area has to be developed as public toilet is required for the town people and as well as for the passengers waiting for departure. **Map 14.3** represents proposed Urban service proposal for ward 1.

Table14.5: Development Proposals for ward 01

ID	Type of facility	Ward no	Mouza Name	Plot no	Area (Acre)
NM_01	Neighborhood Market	1	Khepupara	191-192, 213, 292	0.96
IZ_01	Industrial Zone	1	Khepupara	208,213,217	5.30
WC_01	Ward Center	1	Khepupara	179	0.97
ST_01	Stadium	1	Khepupara	179,182,185	4.14
PP_01	Park	1	Khepupara	154-56,276	2.21
PC_01	Clinic	1	Khepupara	168, 172	1.43
HS_01	Secondary School cum Cyclone Shelter	1	Khepupara	165-168, 304	1.15
BT_01	Bus Terminal	1	Khepupara	332,330,329,334,335	3.09
TT_01	Truck Terminal	1	Khepupara	208, 213	1.00
TS_01	Tempo Stand	1	Khepupara	335,337	0.34
WD_01	Waste Disposal Site	1	Khepupara	133-36,149, 152-53, 282	6.32
WT_01	Waste Transfer Station	1	Khepupara	179,268	0.079
				Total	**26.989**

Map 14.3 : Development Proposal for Ward no. 1



Legend

- Paurashava Boundary
- Ward Boundary Poly
- Mouza Boundary
- College
- Panir Tanki
- Eidgah
- Ferry Ghat
- Fire Service
- Helipad
- Cinema Hall
- Ghat
- Government Office
- Primary School
- High School
- Hospital/Clinic
- Kheya Ghat
- Madrasa
- Market
- Monument
- Mosque
- Waste Transfer Station
- Dumping Site
- Electric Sub-Station
- Police Station
- Post Office
- Pourashava office
- Temple
- Upazilla Parishad
- Auditorium
- Clinic
- Cyclone Shelter
- Ward Center
- Low Income Housing
- Market
- Park
- Primary School
- Resettlement Zone
- Rickshaw/Tempo Stand
- Secondary School
- Shamshan Ghat
- Stadium
- Truck Terminal

0 35 70 140 210 280 Meters

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In Association with

14.4 Ward Action Plan for Ward No. 02

14.4.1 Demography

Ward no. 02 is located on the southern part of the town. It has a moderate density of population. Table 14.6 shows the detail.

Table 14.6: Population Statistics of Ward No. 02

Item	Year			
	2016	2021	2026	2031
Area (acre)	57.27	57.27	57.27	57.27
Population	1719	1969	2255	2582
Density of Population (acre)	30	34	39	45

14.4.2 Ward Action Plan Proposals

14.4.2.1 Review of Existing Land Use

There is no land for Agriculture purpose. Water bodies occupy about 37.52% of the land of the ward. About 14.95 acres of land is under residential uses, 0.42% is used for education, 5.44% for circulation network, and only 1.98% of land is used as community facilities. Table 14.8 shows the existing land use pattern of Kalapara Paurashava.

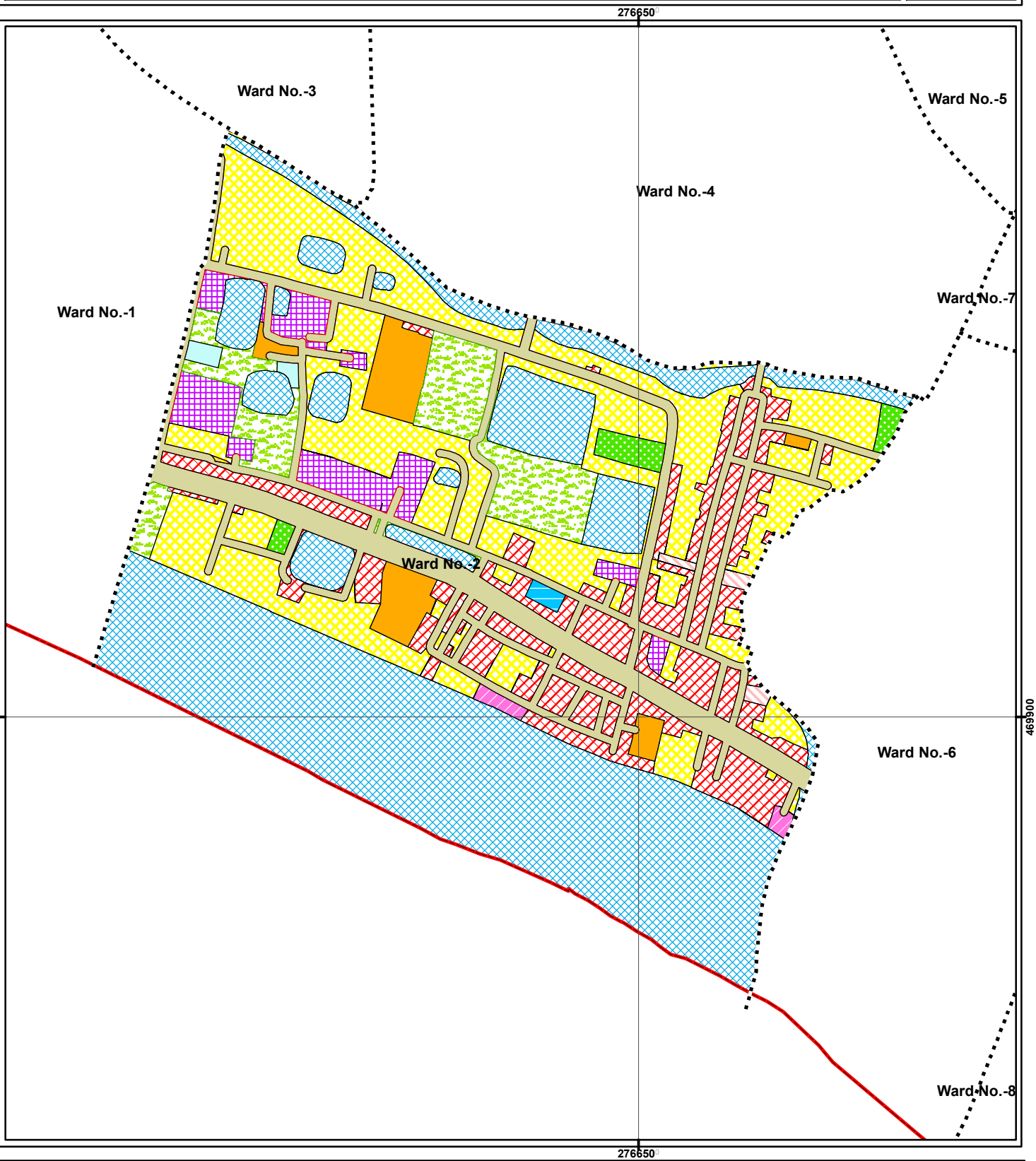
14.4.2.2 Proposed Land Use Zoning

The category wise proposals are presented here. Table 14.7 shows the amount of land existing and proposed uses in Ward no. 2. **Map 14.4** shows proposed land use of Ward 01.

Table 14.7: Comparative Scenario of Existing and Proposed Land Uses of Ward No. 02

Sl. No.	Landuse (Existing)	Area (Acre)	%	Sl. No.	Landuse (Proposed)	Area (Acre)	%
1	Administrative	1.88	3.29	1	Administrative	2.16	3.77
2	Circulation Network	3.11	5.44	2	Circulation Network	8.20	14.31
3	Commercial Activity	8.62	15.04	3	Commercial Activity	6.61	11.55
4	Community Facility	1.13	1.98	4	Community Facility	1.71	2.99
5	Education & Research	0.24	0.42	5	Education & Research	0.24	0.42
6	Mixed	0.19	0.33	6	Mixed	0.17	0.31
7	Open Space	5.31	9.27	7	Open Space	3.39	5.93
8	Recreational Facility	0.12	0.20	8	Recreational Facility	0.10	0.18
9	Residential	14.95	26.11	9	Residential	13.41	23.42
10	Transportation & Communication	0.22	0.39	10	Transportation & Communication	0.19	0.34
11	Waterbody	21.49	37.52	11	Utility Service	0.16	0.29
				12	Waterbody	20.91	36.51
	Total	**57.27**	**100**		**Total**	**57.27**	**100**

Map 14.4 : Landuse Plan of Ward no. 2



Legend

- Paurashava Boundary
- Ward Boundary Poly
- Mouza Boundary

- Administrative
- Agriculture
- Circulation Network
- Commercial Activity
- Community Facility
- Education & Research
- Health Facility
- Industrial
- Mixed Use
- Open Space
- Recreational Facilities
- Rural Settlement
- Transportation Facilities
- Urban Deferred
- Urban Settlement
- Utility Facility
- Waterbody

0 15 30 60 90 120 Meters

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a. Urban Residential Zone

In the Ward Action Plan for Ward no. 02, more than 13.41 acres of land has been earmarked for urban residential use, which will occupy 23.42% of the total land. Table 14.7 shows the details about the existing and proposed land uses of Ward no. 2.

b. Circulation network

To improve the efficiency of the Ward, more roads are proposed, which will consume about 8.20 acres of land covering about 14.31% of the total area. For the improvement of road network, widening of existing roads, link road and new roads are proposed for phase wise development within the first five years.

c. Administrative Area

Total 2.16 acre land has been allocated for administrative purpose. A new Ward councilor's office has been proposed in this ward.

d. Commercial Activity

At present, commercial activity and also the density of population is very low in this ward. Only 6.61 acre of land has been proposed for this purpose, which occupies only 11.55% of total land.

e. Education and Research

A total of 0.24 acres of land is proposed for education and research.

f. Community Facilities

A total of 1.71 acre of land will be used for community facilities covering 2.99 % of the total land of this ward.

g. Utility Services

A total 0.16 acre land has been allocated for utility services. A waste transfer station have been proposed in this ward.

h. Mixed Use Zone

Only 0.17 acre of land will be used as mixed use covering 0.31% of total land.

i. Transport Facilities

A total 0.34% land has been allocated in this purpose.

j. Recreational Facilities

A total 0.18% land has been allocated in this purpose.

k. Open Space

About 3.39 acre of land is allocated for open space.

l. Water Bodies

The total land proposed for water retention area covers 20.91 acres.

14.4.2.3 Proposed Road Infrastructure Development

A total of 4.57 km of road development proposal have been made for Ward no. 02 of Kalapara Paurashava. Length of the tertiary roads is 3.43 km and width of these roads will be 20 ft. The total length of secondary road will be 0.56 km and width of these roads will be 40 ft for this Ward. The total length of Primary road will be 0.58 km and width of these roads will be 60 ft for this Ward The detailed scenario of road network development proposal is given in Table 14.8.

Table 14.8: Road Network Proposal at Ward no. 02

Proposed Road ID	Type	Remark	Existing Width (ft)	Proposed Width (ft)	Length in (m)	Phase
PR-4	Primary Road	Extended	16	60	580.58	1st Phase
Sub-Total					**580.58**	
SR-2	Secondary Road	Extended	10	40	559.76	1st Phase
				Sub-Total	**559.76**	
TR-43	Tertiary Road	Extended	6	20	88.37	2nd Phase
TR-44	Tertiary Road	Extended	4	20	29.72	2nd Phase
TR-45	Tertiary Road	Extended	10	20	30.91	2nd Phase
TR-48	Tertiary Road	Extended	8	20	11.82	2nd Phase
TR-52	Tertiary Road	Extended	10	20	518.69	2nd Phase
TR-53	Tertiary Road	Extended	6	20	8.83	2nd Phase
TR-54	Tertiary Road	Extended	6	20	47.27	2nd Phase
TR-55	Tertiary Road	Extended	8	20	112.31	2nd Phase
TR-56	Tertiary Road	Extended	6	20	25.57	2nd Phase
TR-57	Tertiary Road	Extended	6	20	38.36	2nd Phase
TR-58	Tertiary Road	Extended	8	20	67.59	2nd Phase
TR-59	Tertiary Road	Extended	6	20	57.17	2nd Phase
TR-60	Tertiary Road	Extended	6	20	55.74	2nd Phase
TR-61	Tertiary Road	Extended	8	20	20.81	2nd Phase
TR-62	Tertiary Road	Extended	8	20	20.71	2nd Phase
TR-63	Tertiary Road	Extended	8	20	23.59	2nd Phase
TR-64	Tertiary Road	Extended	8	20	83.49	2nd Phase
TR-65	Tertiary Road	Extended	8	20	176.08	2nd Phase
TR-66	Tertiary Road	Extended	6	20	23.33	2nd Phase
TR-67	Tertiary Road	Extended	8	20	96.98	2nd Phase
TR-68	Tertiary Road	Extended	6	20	62.53	2nd Phase
TR-69	Tertiary Road	Extended	6	20	59.62	2nd Phase
TR-70	Tertiary Road	Extended	6	20	83.20	2nd Phase
TR-71	Tertiary Road	Extended	6	20	35.22	2nd Phase
TR-72	Tertiary Road	Extended	6	20	26.38	2nd Phase
TR-73	Tertiary Road	Extended	6	20	60.47	2nd Phase
TR-74	Tertiary Road	Extended	6	20	98.52	3rd Phase
TR-75	Tertiary Road	Extended	6	20	131.39	3rd Phase
TR-76	Tertiary Road	Extended	4	20	12.95	3rd Phase
TR-77	Tertiary Road	Extended	16	20	35.06	3rd Phase
TR-78	Tertiary Road	Extended	6	20	39.83	3rd Phase
TR-79	Tertiary Road	Extended	4	20	38.18	3rd Phase
TR-80	Tertiary Road	Extended	6	20	37.26	3rd Phase
TR-81	Tertiary Road	Extended	4	20	33.93	3rd Phase
TR-113	Tertiary Road	Extended	6	20	52.80	3rd Phase
TR-114	Tertiary Road	Extended	4	20	48.72	3rd Phase
TR-117	Tertiary Road	Extended	10	20	100.26	3rd Phase
TR-118	Tertiary Road	Extended	8	20	98.86	3rd Phase
TR-120	Tertiary Road	Extended	6	20	23.17	3rd Phase
TR-265	Tertiary Road	Extended	8	20	79.28	3rd Phase
TR-267	Tertiary Road	Extended	6	20	32.56	3rd Phase
TR-281	Tertiary Road	Extended	6	20	71.66	3rd Phase
TR-287	Tertiary Road	Extended	4	20	14.63	3rd Phase
TR-289	Tertiary Road	Extended	10	20	146.67	3rd Phase
TR-301	Tertiary Road	Extended	10	20	25.54	3rd Phase
TR-313	Tertiary Road	Extended	10	20	151.13	3rd Phase
TR-314	Tertiary Road	Extended	10	20	152.81	3rd Phase
TR-315	Tertiary Road	Extended	10	20	17.24	3rd Phase
TR-316	Tertiary Road	Extended	10	20	120.54	3rd Phase
				Sub-Total	**3427.75**	
				Grand Total	**4568.10**	

- "SR" for Secondary Road and TR" for Tertiary Road

14.4.2.4 Drainage Development Plan

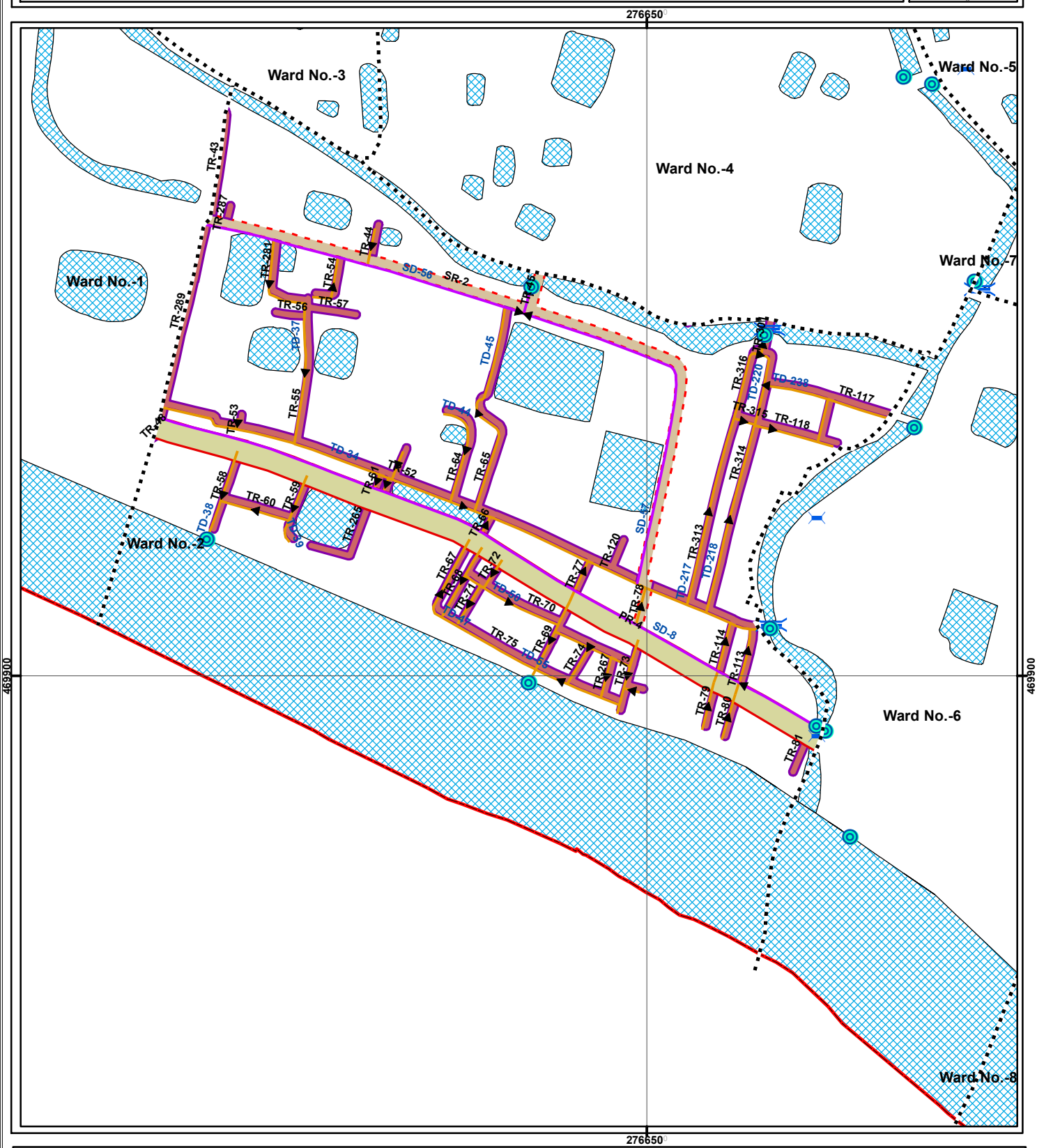
Existing drainage is mostly depending on natural drainage facilities. The proposed drainage facilities will be developed based on these natural channels. Andharmanik River will serve as primary drains for this ward and will be connected by 1.15 km secondary drain and 2.90 km tertiary drain. Table 14.9 shows the details. **Map 14.5** represents proposed Road and Drainage Network of Ward 2

Table14.9: Drainage Development Plan Proposals for ward 02

Drain ID	Type	Width	Depth	Length (M)	Phasing
SD-55	Secondary Drain	2.5-3.5	1.25-2.25	20.94	2nd Phase
SD-56	Secondary Drain	2.5-3.5	1.25-2.25	260.87	2nd Phase
SD-57	Secondary Drain	2.5-3.5	1.25-2.25	298.84	2nd Phase
SD-8	Secondary Drain	2.5-3.5	1.25-2.25	573.58	1st Phase
Sub-Total				**1154.23**	
TD-181	Tertiary Drain	2-2.5	.64-1.25	32.56	3rd Phase
TD-192	Tertiary Drain	2-2.5	.64-1.25	71.66	3rd Phase
TD-197	Tertiary Drain	2-2.5	.64-1.25	0.01	3rd Phase
TD-207	Tertiary Drain	2-2.5	.64-1.25	17.50	3rd Phase
TD-217	Tertiary Drain	2-2.5	.64-1.25	151.13	3rd Phase
TD-218	Tertiary Drain	2-2.5	.64-1.25	152.81	3rd Phase
TD-219	Tertiary Drain	2-2.5	.64-1.25	17.24	3rd Phase
TD-220	Tertiary Drain	2-2.5	.64-1.25	120.54	3rd Phase
TD-238	Tertiary Drain	2-2.5	.64-1.25	101.11	3rd Phase
TD-27	Tertiary Drain	2-2.5	.64-1.25	3.64	2nd Phase
TD-28	Tertiary Drain	2-2.5	.64-1.25	29.72	2nd Phase
TD-29	Tertiary Drain	2-2.5	.64-1.25	1.43	2nd Phase
TD-34	Tertiary Drain	2-2.5	.64-1.25	505.10	2nd Phase
TD-35	Tertiary Drain	2-2.5	.64-1.25	8.83	2nd Phase
TD-36	Tertiary Drain	2-2.5	.64-1.25	47.27	2nd Phase
TD-37	Tertiary Drain	2-2.5	.64-1.25	112.31	2nd Phase
TD-38	Tertiary Drain	2-2.5	.64-1.25	73.53	2nd Phase
TD-39	Tertiary Drain	2-2.5	.64-1.25	57.17	2nd Phase
TD-40	Tertiary Drain	2-2.5	.64-1.25	55.74	2nd Phase
TD-41	Tertiary Drain	2-2.5	.64-1.25	11.46	2nd Phase
TD-42	Tertiary Drain	2-2.5	.64-1.25	11.36	2nd Phase
TD-43	Tertiary Drain	2-2.5	.64-1.25	23.59	2nd Phase
TD-44	Tertiary Drain	2-2.5	.64-1.25	83.49	2nd Phase
TD-45	Tertiary Drain	2-2.5	.64-1.25	176.08	2nd Phase
TD-46	Tertiary Drain	2-2.5	.64-1.25	13.75	2nd Phase
TD-47	Tertiary Drain	2-2.5	.64-1.25	96.98	2nd Phase
TD-48	Tertiary Drain	2-2.5	.64-1.25	62.53	2nd Phase
TD-49	Tertiary Drain	2-2.5	.64-1.25	69.08	2nd Phase
TD-50	Tertiary Drain	2-2.5	.64-1.25	83.20	2nd Phase
TD-51	Tertiary Drain	2-2.5	.64-1.25	35.22	2nd Phase
TD-52	Tertiary Drain	2-2.5	.64-1.25	26.38	2nd Phase
TD-53	Tertiary Drain	2-2.5	.64-1.25	60.47	2nd Phase
TD-54	Tertiary Drain	2-2.5	.64-1.25	98.52	2nd Phase
TD-55	Tertiary Drain	2-2.5	.64-1.25	131.39	2nd Phase
TD-56	Tertiary Drain	2-2.5	.64-1.25	12.95	2nd Phase
TD-58	Tertiary Drain	2-2.5	.64-1.25	35.06	2nd Phase
TD-59	Tertiary Drain	2-2.5	.64-1.25	29.98	2nd Phase
TD-60	Tertiary Drain	2-2.5	.64-1.25	38.18	2nd Phase
TD-61	Tertiary Drain	2-2.5	.64-1.25	37.26	2nd Phase
TD-87	Tertiary Drain	2-2.5	.64-1.25	52.80	2nd Phase
TD-88	Tertiary Drain	2-2.5	.64-1.25	48.72	2nd Phase
TD-91	Tertiary Drain	2-2.5	.64-1.25	98.86	2nd Phase
Sub-Total				**2896.61**	
			Grand Total	**4050.85**	

Besides, it will be necessary to re-excavate all the encroached khals that serve as primary drains. The consultants have identified all existing khals that need to be re-excavated to allow smooth flow of water through them.

Map 14.5 : Road & Drainage Network for Ward no. 2



Legend

- Paurashava Boundary
- Ward Boundary Poly
- Mouza Boundary
- Proposed Outfall
- Bridge
- Culvert
- Proposed Bridge
- Primary Road
- Secondary Road
- Tertiary Road
- Walkway
- Primary Drain
- Secondary Drain
- Tertiary Drain
- Proposed Waterbody

0 35 70 140 210 280 Meters

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Ministry of Local Government,
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CONSULTANT

SCPL Sheltech Consultants (Pvt.) Ltd.

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14.4.2.5 Urban Services

a. Solid Waste Management

Solid waste management is an important urban service. As density of population increases the volume of solid waste also increases proportionately. This ward will be developed as an industrial area. However, the income level is also another major factor influencing the volume of solid waste. Population and the volume of waste in the town are yet to be large enough to become a problem for it. But the present management system is not satisfactory and it might be led to problem in future. The consultant proposes one solid waste transfer station in this ward at on an area of 0.06 acre. It is recommended that home collection system is introduced in the ward by creation of local CBOs. This will cause organized collection of waste and prevent indiscriminate littering.

b. Water Supply

It is proposed to install a network based water supply system by exploring fresh water from the Andharmanik River for the entire Paurashava. And water supply lines in this ward will be established along all categories of roads as per the growth of the settlement.

c. Sanitation

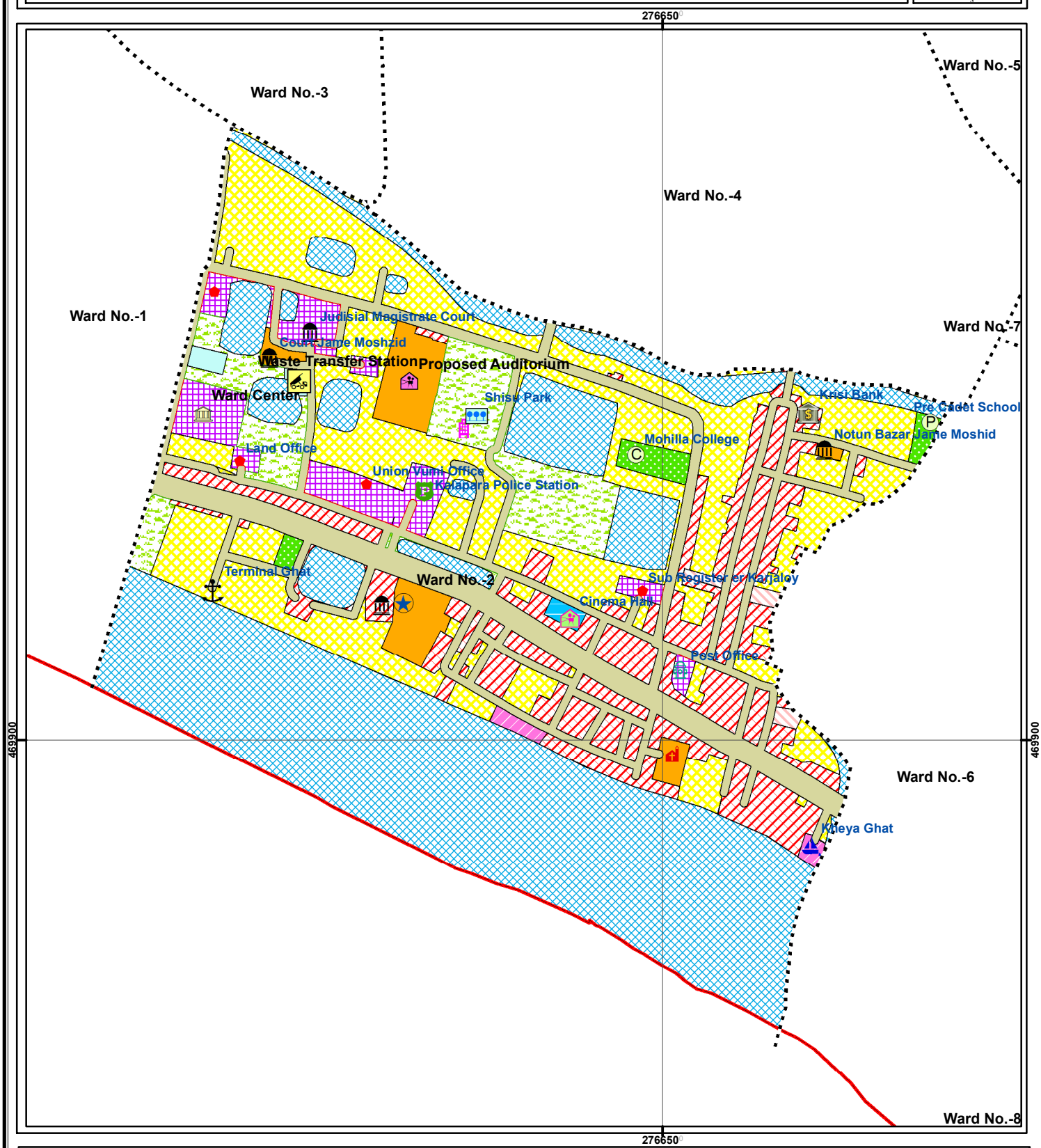
It is apprehended that the government would not be able to provide network and treatment based sanitation system for the town. So the present system of sanitation will continue. However, the Paurashava must try to promote hygienic sanitation to ensure better public health. There is hardly any public toilet in the town to serve the visitors and the local people. The existing toilet of bus terminal area has to be developed as public toilet is required for the town people and as well as for the passengers waiting for departure. **Map 14.6** represents proposed Urban service proposal for ward 2.

Table14.10: Development Proposals for ward 02

ID	Type of facility	Ward no	Mouza Name	Plot no	Area (Acre)
SC_02	Shopping Complex	2	Khepupara	612,632-37,653,655	0.43
CP_02	Children's Park	2	Khepupara	612,644,646	0.97
WC_02	Ward Center	2	Khepupara	636-37,401	0.51
AU_02	Auditorium	2	khepupara	612,641-42,644	0.756
ED_02	Eidgah	2	Khepupara	654-55,658-59	0.601
WD_02	Waste Disposal Site	2	Khepupara	612,639	0.058
				Total	**3.325**

Map 14.6 represents proposed urban services for ward 2.

Map 14.6 : Development Proposal for Ward no. 2



Legend

- Paurashava Boundary
- Ward Boundary Poly
- Mouza Boundary
- College
- Panir Tanki
- Eidgah
- Ferry Ghat
- Fire Service
- Helipad
- Cinema Hall
- Ghat
- Government Office
- Primary School
- High School
- Hospital/Clinic
- Kheya Ghat
- Madrasa
- Market
- Monument
- Mosque
- Waste Transfer Station
- Dumping Site
- Electric Sub-Station
- Police Station
- Post Office
- Pourashava office
- Temple
- Upazilla Parishad
- Auditorium
- Clinic
- Cyclone Shelter
- Ward Center
- Low Income Housing
- Market
- Park
- Primary School
- Resettlement Zone
- Rickshaw/Tempo Stand
- Secondary School
- Shamshan Ghat
- Stadium
- Truck Terminal

0 35 70 140 210 280 Meters

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14.5 Ward Action Plan for Ward No. 03

14.5.1 Demography

Ward No. 03 is located on the north-western part of the town. It has a moderate density of population. Estimated population for the year 2031 will be 2892 in the ward with a density of 40 persons per acre. Table 14.11 shows the detail.

Table 14.11: Population Statistics of Ward No. 03

Item	Year			
	2016	2021	2026	2031
Area (acre)	73.05	73.05	73.05	73.05
Population	1925	2205	2525	2892
Density of Population (acre)	26	30	35	40

14.5.2 Ward Action Plan Proposals

14.5.2.1 Review of Existing Land Use

The maximum land of this ward at present is used for residential purpose. It occupies 39.84 acres land covering more than 54% of the total land. Water bodies occupy about 11.46% of the land of the ward. About 14.44 acres of land is under agricultural uses, 1.39% is used for commercial facilities, 4.61% circulation network. No land in this ward is utilized for service activity. Only 0.26 acres of land is used as community facilities with negligible percentage of educational facilities (1.26%).

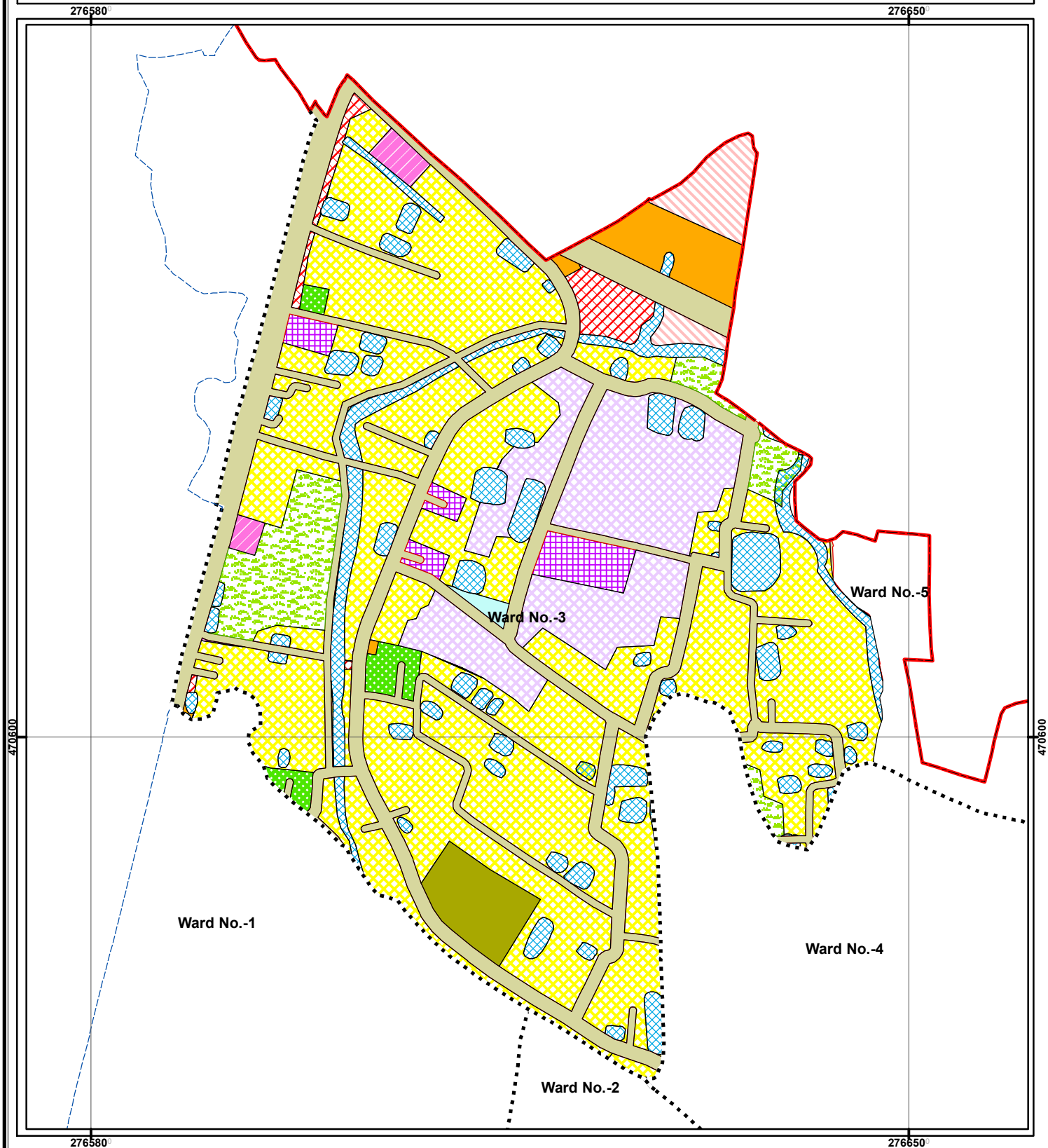
14.5.2.2 Proposed Land Use Zoning

The category wise proposals are presented here. Table 14.12 shows the amount of land existing and proposed uses in Ward no. 03. **Map 14.7** shows proposed land use of Ward 03.

Table14.12: Comparative Scenario of Existing Land Use and Proposed Land Uses of Ward No. 03

Sl. No.	Landuse (Existing)	Area (Acre)	%	Sl. No.	Landuse (Proposed)	Area (Acre)	%
1	Administrative	0.83	1.13	1	Administrative	1.35	1.84
2	Agriculture	14.44	19.77	2	Agriculture	0	0
3	Circulation Network	3.37	4.61	3	Circulation Network	14.04	19.19
4	Commercial Activity	1.02	1.39	4	Commercial Activity	1.07	1.46
5	Community Facility	0.19	0.26	5	Community Facility	1.49	2.03
6	Education & Research	0.90	1.23	6	Education & Research	0.74	1.01
7	Open Space	4.10	5.61	7	Health Facility	1.38	1.89
8	Residential	39.84	54.54	8	Open Space	3.36	4.59
9	Waterbody	8.37	11.46	9	Recreational Facility	0	0
		0.83	1.13	10	Residential	32.68	44.67
				11	Transportation & Communication	0.50	0.68
				12	Urban Deffered	8.00	10.95
				13	Mixed Use	1.42	1.94
				14	Utility Service	0.15	0.21
				15	Waterbody	7.10	9.71
	Total	**73.05**	**100**		**Total**	**73.05**	**100**

Map 14.7 : Landuse Plan of Ward no. 3



Legend

- Paurashava Boundary
- Ward Boundary Poly
- Mouza Boundary

- Administrative
- Agriculture
- Circulation Network
- Commercial Activity
- Community Facility
- Education & Research
- Health Facility
- Industrial
- Mixed Use
- Open Space
- Recreational Facilities
- Rural Settlement
- Transportation Facilities
- Urban Deferred
- Urban Settlement
- Utility Facility
- Waterbody

0 15 30 60 90 120 Meters

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a. Urban Residential

In Ward Action Plan more than 32.68 acre of land has been earmarked for urban residential use which will occupy 44.67% of the total land.

b. Circulation network

To improve the efficiency of the ward more roads are proposed which will consume 14.04 acres of land and almost 19.19% of the total area. For network improvement widening of existing road, link road and new roads are proposed which will be done phase wise within 2031.

c. Administrative

A total 1.35 acre land has been allocated in this ward in administrative purpose. A police box and ward councilor's office have been proposed in this ward 3.

d. Commercial Activity

Total 1.07 acre of land is allocated for commercial use. In the allocated mixed use zone more commercial activities will also be operated.

e. Education and Research

In addition 0.74 acre of land has been proposed for education and research.

f. Health services

Total 1.38 acres land has been allocated in this ward. A health center has been proposed.

g. Community Facilities

Land for community facilities will be increased from 1.49 acres to 2.03 in future.

h. Utility Services

0.15 acre land will be used for Utility Services which include a proposed waste transfer station.

i. Transport and Communication

Total 0.50 acre of land will be used for transport and communication at Ward no. 03.

j. Recreational Facilities

No land is proposed for this purpose in this ward.

k. Open Space

Above 3.36 acres of land has been allocated as open spaces which include Neighborhood Park, park and other open spaces.

l. Agricultural Area

No land is proposed for this purpose in this ward.

m. Water Body

As the ponds will be preserved as the water retention ponds the proposed retention area covers about 7.10 acres of land which will cover more than 9.71% of the total land of the ward.

14.5.2.3 Proposed Road Infrastructure Development

Total 5.81 km road development proposal have been proposed for Ward no. 03. Length of the tertiary road will be 3.17 km and width of these roads will be not less than 20 ft. Total length of secondary road will be 1.94 km and width of these roads will be 40 ft. There are two primary road

proposals in ward no. 03 which length is 0.70 km. Detail scenario of road network development proposal is given in Table 14.13.

Table 14.13: Road Network Proposal at Ward no. 03

Proposed Road ID	Type	Remark	Existing Width (ft)	Proposed Width (ft)	Length in (m)	Phase
PR-1	Primary Road	Extended	24	150	346.52	1st Phase
PR-3	Primary Road	New	0	80	351.95	2nd Phase
				Sub-Total	**698.47**	
SR-3	Secondary Road	Extended	8	40	280.79	1st Phase
SR-8	Secondary Road	Extended	8	40	401.42	1st Phase
SR-13	Secondary Road	Extended	8	40	161.11	2nd Phase
SR-18	Secondary Road	Extended	10	40	376.29	2nd Phase
SR-19	Secondary Road	Extended	10	40	74.24	2nd Phase
SR-20	Secondary Road	Extended	10	40	557.98	2nd Phase
SR-26	Secondary Road	Extended	8	40	90.41	2nd Phase
				Sub-Total	**1942.24**	
TR-10	Tertiary Road	Extended	6	20	7.10	2nd Phase
TR-16	Tertiary Road	Extended	6	20	4.95	2nd Phase
TR-17	Tertiary Road	Extended	6	20	4.84	2nd Phase
TR-18	Tertiary Road	Extended	6	20	5.17	2nd Phase
TR-34	Tertiary Road	Extended	6	20	130.21	2nd Phase
TR-35	Tertiary Road	Extended	6	20	208.40	2nd Phase
TR-36	Tertiary Road	Extended	6	20	68.67	2nd Phase
TR-37	Tertiary Road	Extended	6	20	50.42	2nd Phase
TR-38	Tertiary Road	Extended	6	20	32.09	2nd Phase
TR-39	Tertiary Road	Extended	6	20	142.12	2nd Phase
TR-40	Tertiary Road	Extended	6	20	119.66	2nd Phase
TR-41	Tertiary Road	Extended	6	20	30.65	2nd Phase
TR-42	Tertiary Road	Extended	4	20	5.32	2nd Phase
TR-125	Tertiary Road	Extended	6	20	27.85	3rd Phase
TR-126	Tertiary Road	Extended	10	20	19.52	3rd Phase
TR-127	Tertiary Road	Extended	10	20	20.23	3rd Phase
TR-128	Tertiary Road	Extended	8	20	534.49	3rd Phase
TR-129	Tertiary Road	Extended	10	20	39.91	3rd Phase
TR-130	Tertiary Road	Extended	6	20	35.46	3rd Phase
TR-133	Tertiary Road	Extended	10	20	6.61	3rd Phase
TR-145	Tertiary Road	Extended	6	20	72.57	3rd Phase
TR-147	Tertiary Road	Extended	6	20	46.99	3rd Phase
TR-148	Tertiary Road	Extended	8	20	163.01	3rd Phase
TR-149	Tertiary Road	Extended	6	20	21.37	3rd Phase
TR-150	Tertiary Road	Extended	6	20	22.50	3rd Phase
TR-151	Tertiary Road	Extended	6	20	24.04	3rd Phase
TR-152	Tertiary Road	Extended	6	20	64.50	3rd Phase
TR-272	Tertiary Road	Extended	8	20	6.13	3rd Phase
TR-274	Tertiary Road	Extended	6	20	32.33	3rd Phase
TR-275	Tertiary Road	Extended	6	20	12.93	3rd Phase
TR-288	Tertiary Road	Extended	6	20	30.80	3rd Phase
TR-325	Tertiary Road	New	0	20	527.30	3rd Phase
TR-328	Tertiary Road	Extended	8	20	238.23	3rd Phase
TR-329	Tertiary Road	Extended	8	20	231.09	3rd Phase
TR-330	Tertiary Road	Extended	8	20	143.01	3rd Phase
TR-331	Tertiary Road	Extended	8	20	41.04	3rd Phase
				Sub-Total	**3171.51**	
				Grand Total	**5812.22**	

- "PR" for Primary Road, "SR" for Secondary Road and TR" for Tertiary Road

14.5.2.4 Drainage Development Plan

Existing drainage is mostly depending on natural drainage facilities, a canal connected with Andharmanik River. The proposed drainage facilities will be developed based on these natural channels. These will serve as primary drain for the ward which will be connected by 0.56 km Primary drain, 1.68 km secondary drain and 5.57 km tertiary drain. Table 14.14 shows the detail.

Table 14.14: Drainage Development Plan Proposals for ward 03

Drain ID	Type	Width	Depth	Length (M)	Phasing
PD-1	Primary Drain	3.5-4.5	2.25-3.00	557.71	1st Phase
Sub-Total				**557.71**	
SD-17	Secondary Drain	2.5-3.5	1.25-2.25	14.42	1st Phase
SD-19	Secondary Drain	2.5-3.5	1.25-2.25	278.82	1st Phase
SD-20	Secondary Drain	2.5-3.5	1.25-2.25	416.81	1st Phase
SD-37	Secondary Drain	2.5-3.5	1.25-2.25	1.72	1st Phase
SD-38	Secondary Drain	2.5-3.5	1.25-2.25	137.72	1st Phase
SD-39	Secondary Drain	2.5-3.5	1.25-2.25	114.75	1st Phase
SD-4	Secondary Drain	2.5-3.5	1.25-2.25	305.30	1st Phase
SD-40	Secondary Drain	2.5-3.5	1.25-2.25	83.32	1st Phase
SD-52	Secondary Drain	2.5-3.5	1.25-2.25	32.56	2nd Phase
SD-53	Secondary Drain	2.5-3.5	1.25-2.25	104.55	2nd Phase
SD-7	Secondary Drain	2.5-3.5	1.25-2.25	188.80	1st Phase
Sub-Total				**1678.77**	
TD-1	Tertiary Drain	2-2.5	.64-1.25	893.97	2nd Phase
TD-10	Tertiary Drain	2-2.5	.64-1.25	146.98	2nd Phase
TD-100	Tertiary Drain	2-2.5	.64-1.25	25.58	2nd Phase
TD-103	Tertiary Drain	2-2.5	.64-1.25	257.92	2nd Phase
TD-115	Tertiary Drain	2-2.5	.64-1.25	74.95	2nd Phase
TD-116	Tertiary Drain	2-2.5	.64-1.25	46.99	2nd Phase
TD-117	Tertiary Drain	2-2.5	.64-1.25	163.01	2nd Phase
TD-118	Tertiary Drain	2-2.5	.64-1.25	13.86	2nd Phase
TD-119	Tertiary Drain	2-2.5	.64-1.25	14.99	2nd Phase
TD-120	Tertiary Drain	2-2.5	.64-1.25	71.87	2nd Phase
TD-179	Tertiary Drain	2-2.5	.64-1.25	231.09	3rd Phase
TD-18	Tertiary Drain	2-2.5	.64-1.25	113.40	2nd Phase
TD-180	Tertiary Drain	2-2.5	.64-1.25	177.92	3rd Phase
TD-187	Tertiary Drain	2-2.5	.64-1.25	18.48	3rd Phase
TD-188	Tertiary Drain	2-2.5	.64-1.25	28.89	3rd Phase
TD-19	Tertiary Drain	2-2.5	.64-1.25	146.77	2nd Phase
TD-196	Tertiary Drain	2-2.5	.64-1.25	30.80	3rd Phase
TD-20	Tertiary Drain	2-2.5	.64-1.25	52.16	2nd Phase
TD-21	Tertiary Drain	2-2.5	.64-1.25	33.89	2nd Phase
TD-216	Tertiary Drain	2-2.5	.64-1.25	112.45	3rd Phase
TD-22	Tertiary Drain	2-2.5	.64-1.25	73.58	2nd Phase
TD-23	Tertiary Drain	2-2.5	.64-1.25	105.61	2nd Phase
TD-232	Tertiary Drain	2-2.5	.64-1.25	319.74	3rd Phase
TD-234	Tertiary Drain	2-2.5	.64-1.25	238.23	3rd Phase
TD-235	Tertiary Drain	2-2.5	.64-1.25	166.42	3rd Phase
TD-24	Tertiary Drain	2-2.5	.64-1.25	17.29	2nd Phase
TD-25	Tertiary Drain	2-2.5	.64-1.25	203.57	2nd Phase
TD-276	Tertiary Drain	2-2.5	.64-1.25	41.37	3rd Phase
TD-277	Tertiary Drain	2-2.5	.64-1.25	203.69	3rd Phase
TD-279	Tertiary Drain	2-2.5	.64-1.25	56.60	3rd Phase
TD-4	Tertiary Drain	2-2.5	.64-1.25	462.90	2nd Phase
TD-57	Tertiary Drain	2-2.5	.64-1.25	270.44	2nd Phase
TD-9	Tertiary Drain	2-2.5	.64-1.25	74.94	2nd Phase
TD-97	Tertiary Drain	2-2.5	.64-1.25	193.39	2nd Phase
TD-98	Tertiary Drain	2-2.5	.64-1.25	319.39	2nd Phase
TD-99	Tertiary Drain	2-2.5	.64-1.25	164.93	2nd Phase
Sub-Total				**5568.06**	
			Total	**7804.54**	

Map 14.8 represents Road and Drainage Network for ward 3.

14.5.2.5 Urban Services

a. Solid Waste Management

The consultant proposes a waste transfer station with 0.15 acre. It is recommended that home collection system is introduced in the ward by creation of local CBOs. This will create organized collection of waste and prevent indiscriminate littering.

b. Water Supply

It is proposed to install a network based water supply system by exploring fresh water from the Andharmanik River for the entire Paurashava.

c. Sanitation

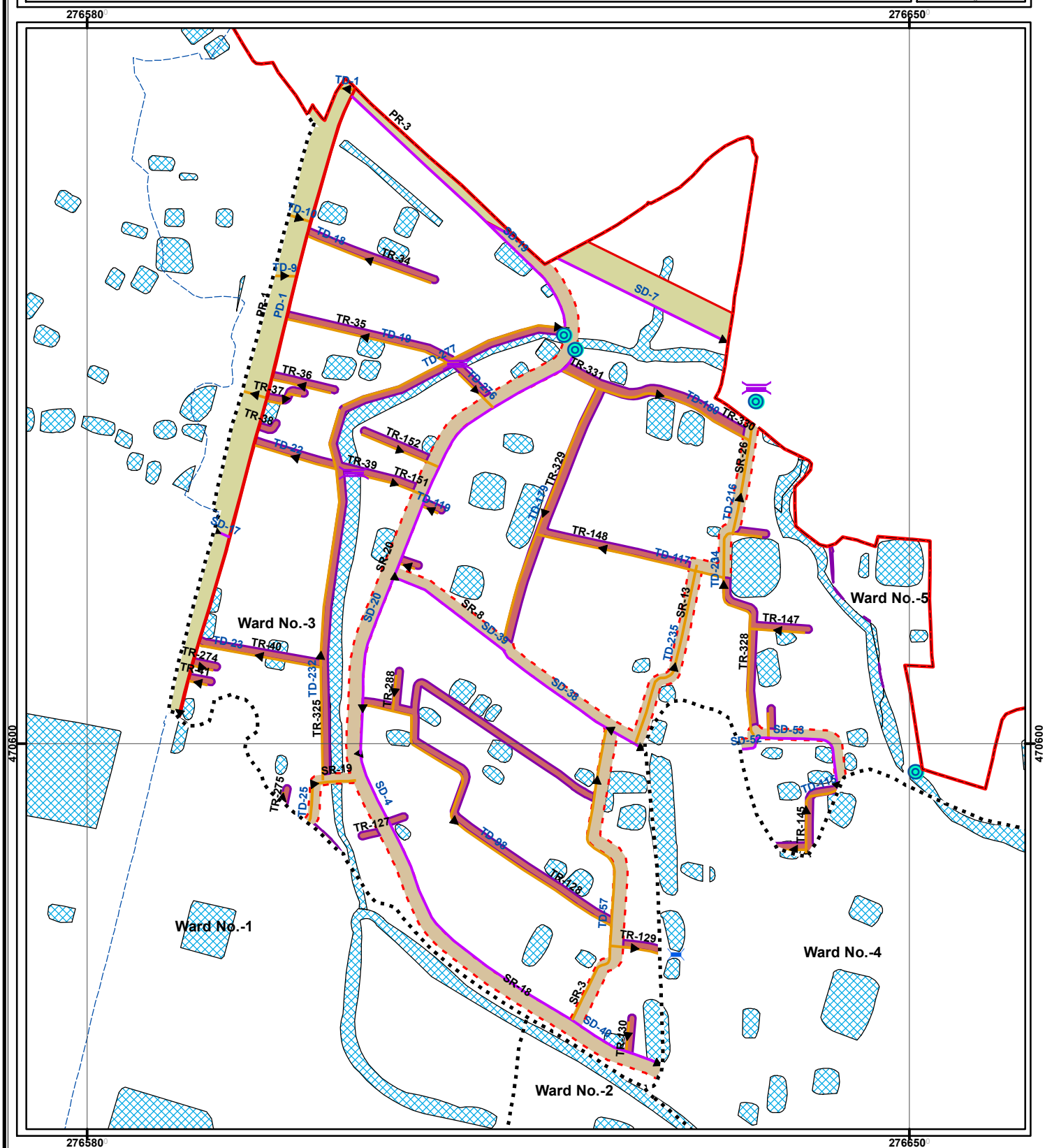
The Paurashava must try to promote hygienic sanitation for the whole Paurashavsa to ensure better public health.

Table 14.15: Development Proposals for ward 03

ID	Type of facility	Ward no	Mouza Name	Plot no	Area (Acre)
WM_03	Wholesale Market	3	Khepupara	402-404	0.75
WC_03	Ward Center	3	Khepupara	638	0.75
PP_03	Park	3	Khepupara	352-53	2.38
PC_03	Clinic	3	Khepupara	381-383, 385	1.38
RS_03	Rickshaw stand	3	Khepupara	360,362	0.31
WT_03	Waste Transfer Station	3	Khepupara	401	0.153
				Total	**5.723**

Map 14.9 represents development proposals for ward 3.

Map 14.8 : Road & Drainage Network for Ward no. 3



Legend

- Paurashava Boundary
- Ward Boundary Poly
- Mouza Boundary
- Proposed Outfall
- Bridge
- Culvert
- Proposed Bridge
- Primary Road
- Secondary Road
- Tertiary Road
- Walkway
- Primary Drain
- Secondary Drain
- Tertiary Drain
- Proposed Waterbody

0 35 70 140 210 280 Meters

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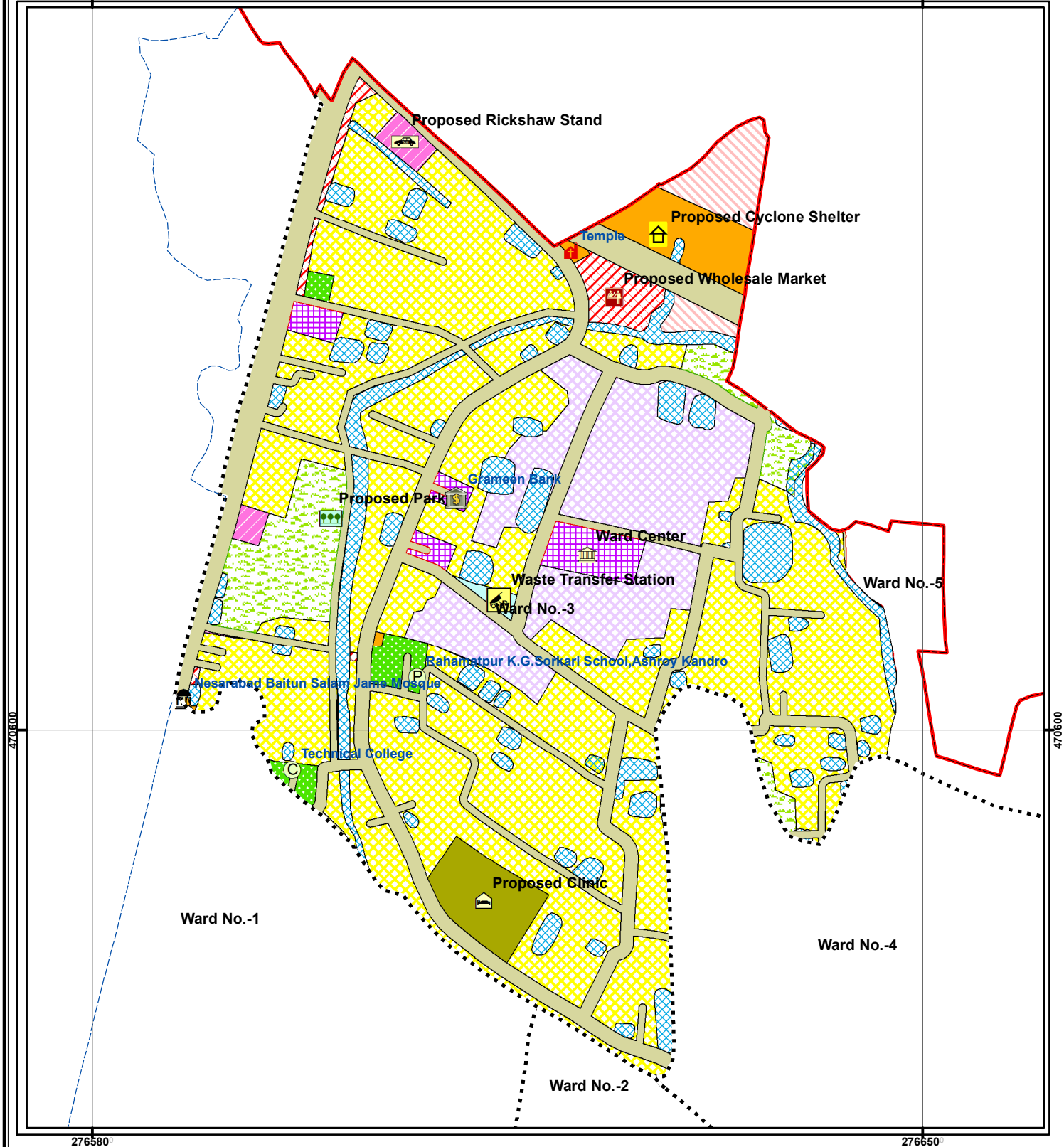
Map 14.9 : Development Proposal for Ward no. 3



Legend

- Paurashava Boundary
- Ward Boundary Poly
- Mouza Boundary
- College
- Panir Tanki
- Eidgah
- Ferry Ghat
- Fire Service
- Helipad
- Cinema Hall
- Ghat
- Government Office
- Primary School
- High School
- Hospital/Clinic
- Kheya Ghat
- Madrasa
- Market
- Monument
- Mosque
- Waste Transfer Station
- Dumping Site
- Electric Sub-Station
- Police Station
- Post Office
- Pourashava office
- Temple
- Upazilla Parishad
- Auditorium
- Clinic
- Cyclone Shelter
- Ward Center
- Low Income Housing
- Market
- Park
- Primary School
- Resettlement Zone
- Rickshaw/Tempo Stand
- Secondary School
- Shamshan Ghat
- Stadium
- Truck Terminal

0 35 70 140 210 280 Meters

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14.6 Ward Action Plan for Ward No. 04

14.6.1 Demography

Ward no. 4 is located on the middle part of the Paurashava. It is one of the smallest wards in the entire paurashava. Population projection shows that 2290 people would be living in the ward in the year 2031 with a very high density of 59 persons per acre. Table 14.16 shows the detail.

Table 14.16: Population Statistics of Ward No. 04

Item	Year			
	2016	**2021**	**2026**	**2031**
Area (acre)	38.80	38.80	38.80	38.80
Population	1524	1746	1999	2290
Density of Population (acre)	39	45	52	59

14.6.2 Ward Action Plan Proposals

14.6.2.1 Review of Existing Land Use

Out of total 38.80 acre there is no land is used as agricultural use. 19.65 acres land is used in residential purpose. It occupies more than 50% of total land. Water bodies occupy 10.59% land of the ward. Almost 2.31 acre of land is used for educational purpose. At present 0.54 acres of land are used in commercial purpose. About 4.48% is used as circulation network.

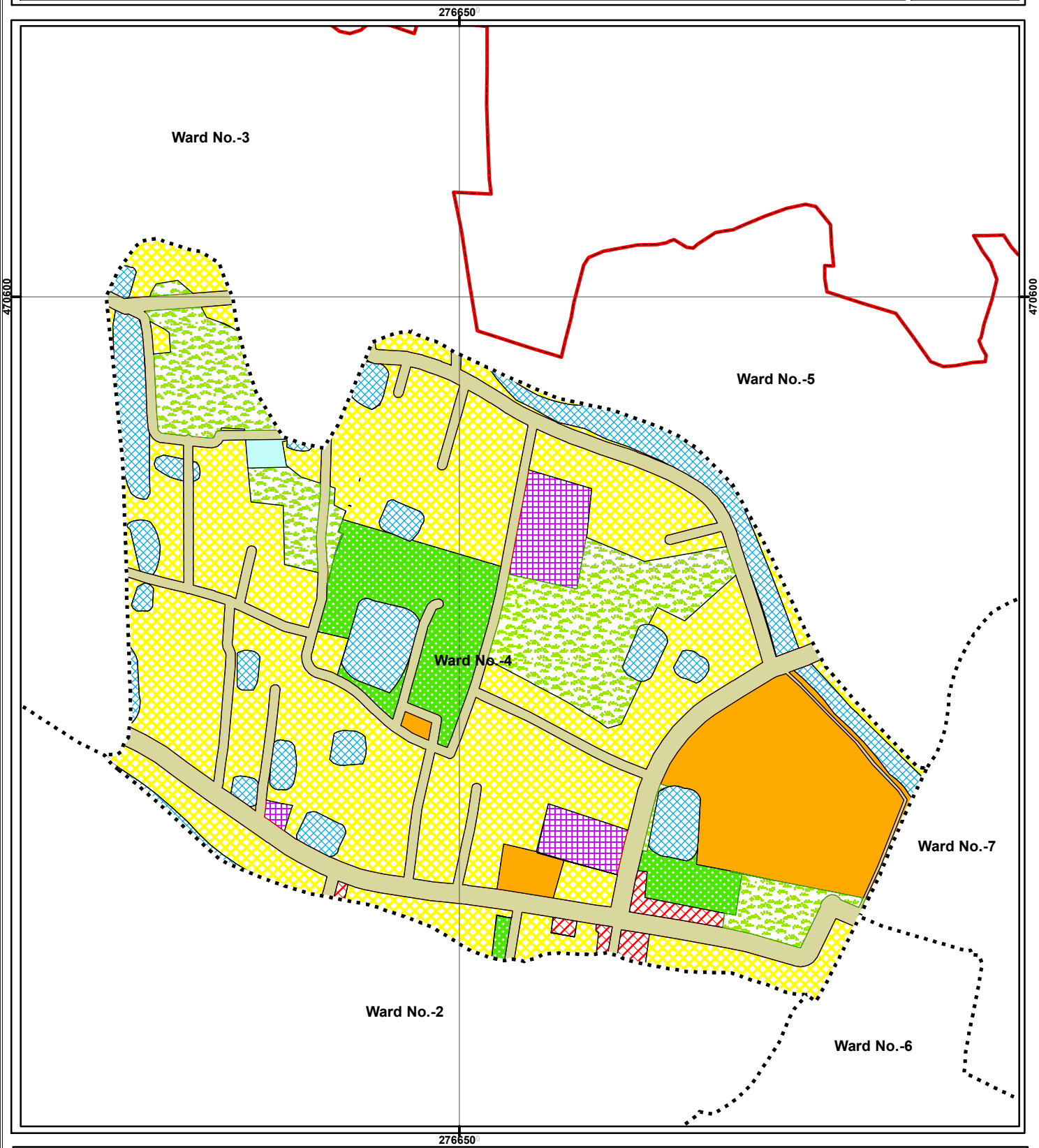
14.6.2.2 Proposed Land Use Zoning

The category wise proposals are presented here. Table 14.17 shows the amount of land existing and proposed uses in Ward no. 04. **Map 14.10** shows proposed land use of Ward 04.

Table 14.17: Comparative Scenario of Existing and Proposed Land Uses of Ward No. 04

Sl. No.	Landuse (Existing)	Area (Acre)	%	Sl. No.	Landuse (Proposed)	Area (Acre)	%
1	Administrative	0.52	1.33	1	Administrative	1.17	3.02
2	Circulation Network	1.74	4.48	2	Circulation Network	5.77	14.86
3	Commercial Activity	0.54	1.38	3	Commercial Activity	0.35	0.91
4	Community Facility	4.06	10.47	4	Community Facility	3.79	9.76
5	Education & Research	2.31	5.96	5	Education & Research	2.13	5.49
6	Open Space	5.88	15.14	6	Open Space	4.59	11.83
7	Residential	19.65	50.65	7	Residential	16.91	43.57
8	Waterbody	4.11	10.59	8	Utility Service	0.11	0.28
				9	Waterbody	3.99	10.28
	Total	**38.80**	**100**		**Total**	**38.80**	**100**

Map 14.10 : Landuse Plan of Ward no. 4



Legend

- Paurashava Boundary
- Ward Boundary Poly
- Mouza Boundary

- Administrative
- Agriculture
- Circulation Network
- Commercial Activity
- Community Facility
- Education & Research
- Health Facility
- Industrial
- Mixed Use
- Open Space
- Recreational Facilities
- Rural Settlement
- Transportation Facilities
- Urban Deferred
- Urban Settlement
- Utility Facility
- Waterbody

0 12.5 25 50 75 100 Meters

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a. Urban Residential Zone

In Ward Action Plan more than 16.91 acres of land has been earmarked for urban residential use which will occupy about 45.58 % of the total land.

b. Circulation network

To improve the efficiency of the ward more roads are proposed which will consume 5.77 acres of land and more than 14.86% of the total area. For network improvement widening of existing road, link road and new roads are proposed which will be done phase wise within 2031.

c. Administrative

Total 1.17 acres land has been allocated for administrative purpose. One ward councilor's office and one police box have been proposed in this ward.

d. Commercial Activity

0.91% land is allocated specially for this purpose. Small amount of future commercial use will be done within the mixed use zone.

e. Education and Research

More than 2.13 acres of land has been proposed to make available more education and research facilities to the ward and its vicinity.

f. Community Facilities

Proposed land for community service will cover 3.79 acre of land.

g. Utility Service

A total 0.31% land has been allocated for utility services.

h.Transport and Communication

There is no proposed land for this purpose.

i. Industrial Activity

There is no proposed land for this purpose.

j. Open Space

There is 4.58 acre of land for Open Space treated as open recreational facilities.

k. Water Body

The proposed retention area occupies about 3.99 acres of land which will cover more than 10.28% of the total land of the ward.

14.6.2.3 Proposed Road Infrastructure Development

Total 5.05 km road development proposal have been proposed for Ward no. 04. 3.67 km long tertiary road will be 20 ft wide. Total length of secondary road will be 1.19 km and width of these roads will be 40 ft for this ward. 0.20 km long walkway with 6 ft width has been proposed. Detail scenario of road network development proposal was given in Table 14.18.

Table 14.18: Road Network Proposal at Ward no. 04

Proposed Road ID	Type	Remark	Existing Width (ft)	Proposed Width (ft)	Length in (m)	Phase
SR-7	Secondary Road	Extended	10	40	179.23	1st Phase
SR-8	Secondary Road	Extended	8	40	439.92	1st Phase
SR-11	Secondary Road	Extended	10	40	227.84	1st Phase
SR-18	Secondary Road	Extended	10	40	340.69	2nd Phase
				Sub-Total	**1187.68**	
TR-45	Tertiary Road	Extended	10	20	17.96	2nd Phase
TR-46	Tertiary Road	Extended	8	20	36.09	2nd Phase
TR-125	Tertiary Road	Extended	6	20	172.65	3rd Phase
TR-129	Tertiary Road	Extended	10	20	125.02	3rd Phase
TR-131	Tertiary Road	Extended	8	20	124.10	3rd Phase
TR-132	Tertiary Road	Extended	6	20	87.05	3rd Phase
TR-133	Tertiary Road	Extended	10	20	251.31	3rd Phase
TR-134	Tertiary Road	Extended	6	20	68.66	3rd Phase
TR-135	Tertiary Road	Extended	8	20	91.34	3rd Phase
TR-136	Tertiary Road	Extended	8	20	220.09	3rd Phase
TR-137	Tertiary Road	Extended	8	20	127.44	3rd Phase
TR-138	Tertiary Road	Extended	10	20	126.77	3rd Phase
TR-142	Tertiary Road	Extended	6	20	37.18	3rd Phase
TR-143	Tertiary Road	Extended	6	20	56.08	3rd Phase
TR-144	Tertiary Road	Extended	6	20	22.44	3rd Phase
TR-145	Tertiary Road	Extended	6	20	2.37	3rd Phase
TR-146	Tertiary Road	Extended	6	20	14.39	3rd Phase
TR-276	Tertiary Road	Extended	6	20	95.35	3rd Phase
TR-277	Tertiary Road	Extended	4	20	35.78	3rd Phase
TR-301	Tertiary Road	Extended	10	20	24.20	3rd Phase
TR-334	Walkway	New	0	6	197.34	3rd Phase
TR-45	Tertiary Road	Extended	10	20	17.96	2nd Phase
TR-46	Tertiary Road	Extended	8	20	36.09	2nd Phase
TR-125	Tertiary Road	Extended	6	20	172.65	3rd Phase
TR-129	Tertiary Road	Extended	10	20	125.02	3rd Phase
TR-131	Tertiary Road	Extended	8	20	124.10	3rd Phase
TR-132	Tertiary Road	Extended	6	20	87.05	3rd Phase
TR-133	Tertiary Road	Extended	10	20	251.31	3rd Phase
TR-134	Tertiary Road	Extended	6	20	68.66	3rd Phase
TR-135	Tertiary Road	Extended	8	20	91.34	3rd Phase
TR-136	Tertiary Road	Extended	8	20	220.09	3rd Phase
TR-137	Tertiary Road	Extended	8	20	127.44	3rd Phase
TR-138	Tertiary Road	Extended	10	20	126.77	3rd Phase
TR-142	Tertiary Road	Extended	6	20	37.18	3rd Phase
TR-143	Tertiary Road	Extended	6	20	56.08	3rd Phase
TR-144	Tertiary Road	Extended	6	20	22.44	3rd Phase
TR-145	Tertiary Road	Extended	6	20	2.37	3rd Phase
TR-146	Tertiary Road	Extended	6	20	14.39	3rd Phase
TR-276	Tertiary Road	Extended	6	20	95.35	3rd Phase
TR-277	Tertiary Road	Extended	4	20	35.78	3rd Phase
TR-301	Tertiary Road	Extended	10	20	24.20	3rd Phase
				Sub-Total	**3669.88**	
TR-334	Walkway	New	0	6	197.34	3rd Phase
				Sub-Total	**3867.22**	
				Grand Total	**5054.9**	

- “SR” for Secondary Road and TR” for Tertiary Road and Walkway

14.6.2.4 Drainage Development Plan

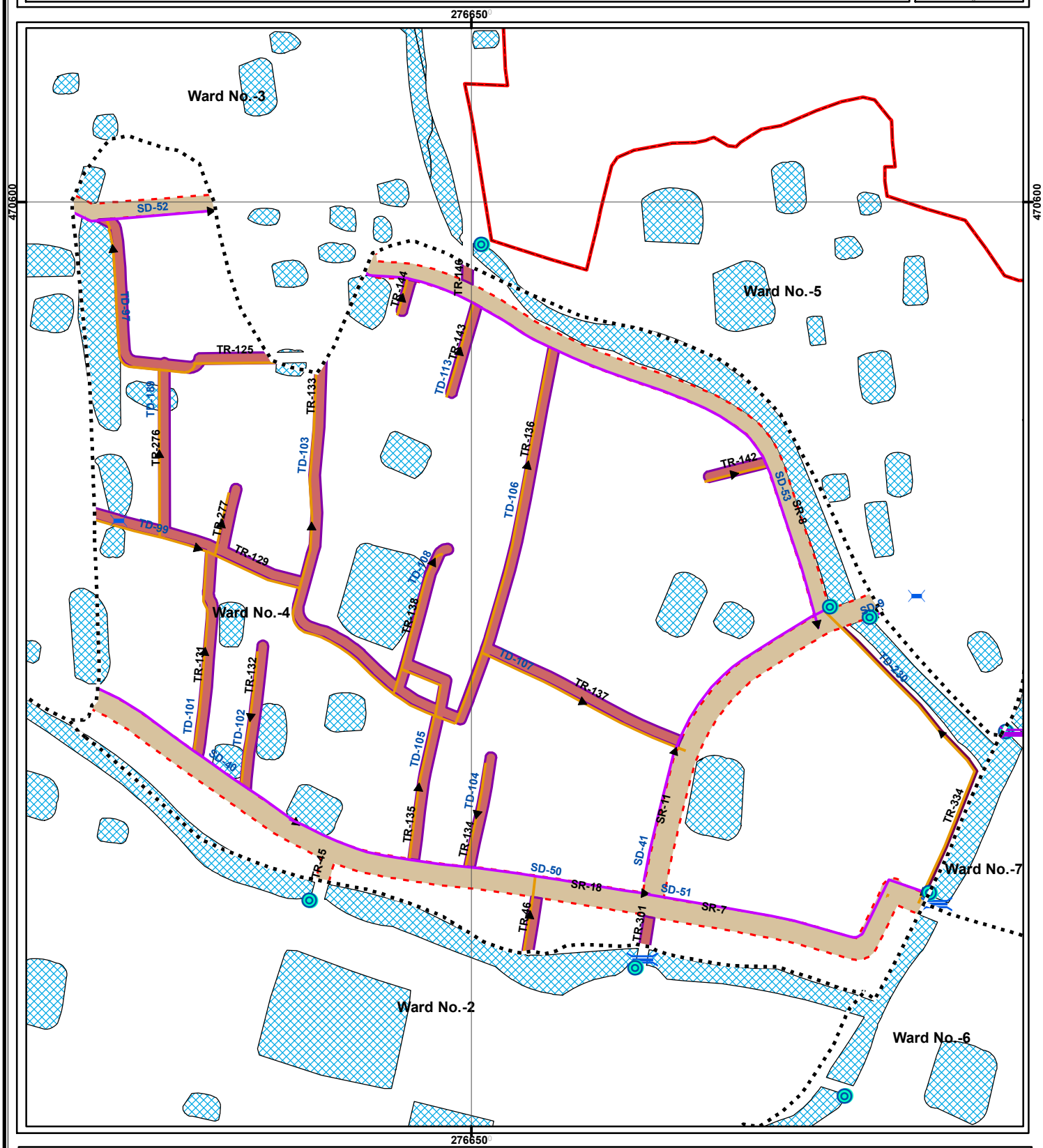
There is manmade drainage facility at Ward no. 04 of Kalapara Paurashava. Existing drainage is mostly depending on natural drainage facilities, Andharmanik river will be served as primary drain for the ward. Table 14.19 shows the detail.

Table 14.19: Drainage Development Plan Proposals for ward 04

Drain ID	Type	Width	Depth	Length (M)	Phasing
SD-35	Secondary Drain	2.5-3.5	1.25-2.25	0.64	1st Phase
SD-36	Secondary Drain	2.5-3.5	1.25-2.25	0.13	1st Phase
SD-40	Secondary Drain	2.5-3.5	1.25-2.25	137.82	1st Phase
SD-41	Secondary Drain	2.5-3.5	1.25-2.25	197.62	1st Phase
SD-50	Secondary Drain	2.5-3.5	1.25-2.25	208.42	2nd Phase
SD-51	Secondary Drain	2.5-3.5	1.25-2.25	181.73	2nd Phase
SD-52	Secondary Drain	2.5-3.5	1.25-2.25	82.05	2nd Phase
SD-53	Secondary Drain	2.5-3.5	1.25-2.25	353.55	2nd Phase
SD-9	Secondary Drain	2.5-3.5	1.25-2.25	7.04	1st Phase
Sub-Total				**1169.00**	
TD-101	Tertiary Drain	2-2.5	.64-1.25	113.38	2nd Phase
TD-102	Tertiary Drain	2-2.5	.64-1.25	75.54	2nd Phase
TD-103	Tertiary Drain	2-2.5	.64-1.25	251.03	2nd Phase
TD-104	Tertiary Drain	2-2.5	.64-1.25	59.73	2nd Phase
TD-105	Tertiary Drain	2-2.5	.64-1.25	82.39	2nd Phase
TD-106	Tertiary Drain	2-2.5	.64-1.25	220.09	2nd Phase
TD-107	Tertiary Drain	2-2.5	.64-1.25	127.44	2nd Phase
TD-108	Tertiary Drain	2-2.5	.64-1.25	126.77	2nd Phase
TD-110	Tertiary Drain	2-2.5	.64-1.25	7.04	2nd Phase
TD-112	Tertiary Drain	2-2.5	.64-1.25	37.18	2nd Phase
TD-113	Tertiary Drain	2-2.5	.64-1.25	56.08	2nd Phase
TD-114	Tertiary Drain	2-2.5	.64-1.25	22.44	2nd Phase
TD-115	Tertiary Drain	2-2.5	.64-1.25	0.05	2nd Phase
TD-189	Tertiary Drain	2-2.5	.64-1.25	95.35	3rd Phase
TD-190	Tertiary Drain	2-2.5	.64-1.25	35.78	3rd Phase
TD-230	Tertiary Drain	2-2.5	.64-1.25	205.09	3rd Phase
TD-250	Tertiary Drain	2-2.5	.64-1.25	0.59	3rd Phase
TD-251	Tertiary Drain	2-2.5	.64-1.25	1.53	3rd Phase
TD-29	Tertiary Drain	2-2.5	.64-1.25	43.60	2nd Phase
TD-97	Tertiary Drain	2-2.5	.64-1.25	172.57	2nd Phase
TD-99	Tertiary Drain	2-2.5	.64-1.25	122.07	2nd Phase
			Sub-Total	**1855.74**	
			Total	**3024.74**	

Besides, it will be necessary to re-excavate the khals that serve as primary drains. **Map 14.11** represents proposed Road and Drainage Network for Ward 4.

Map 14.11 : Road & Drainage Network for Ward no. 4



Legend

- Paurashava Boundary
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- Proposed Outfall
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0 35 70 140 210 280 Meters

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14.6.2.5 Urban Services

a. Solid Waste Management

Solid waste management is an important urban service. As density of population increases the volume of solid waste also increases proportionately. This ward will be developed as an industrial area. However, the income level is also another major factor influencing the volume of solid waste. Population and the volume of waste in the town are yet to be large enough to become a problem for it. But the present management system is not satisfactory and it might be led to problem in future. The consultant proposes one solid waste transfer station in this ward at on an area of 0.11 acre. It is recommended that home collection system is introduced in the ward by creation of local CBOs. This will cause organized collection of waste and prevent indiscriminate littering.

b. Water Supply

It is proposed to install a network based water supply system by exploring fresh water from the Andharmanik River for the entire Paurashava. And water supply lines in this ward will be established along all categories of roads as per the growth of the settlement.

c. Sanitation

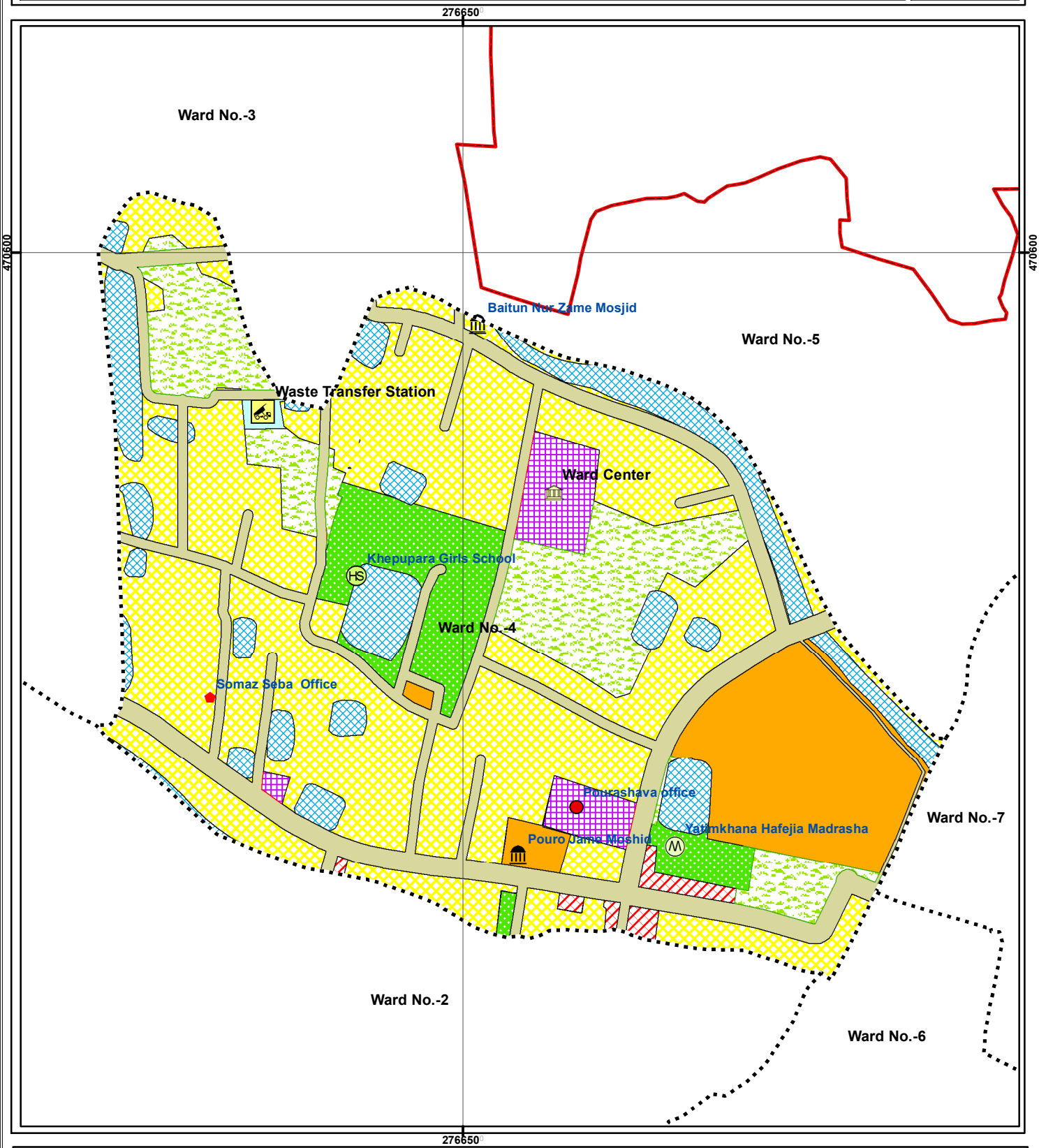
It is apprehended that the government would not be able to provide network and treatment based sanitation system for the town. So the present system of sanitation will continue. However, the Paurashava must try to promote hygienic sanitation to ensure better public health. There is hardly any public toilet in the town to serve the visitors and the local people. The existing toilet of bus terminal area has to be developed as public toilet is required for the town people and as well as for the passengers waiting for departure. **Map 14.12** represents proposed Urban service proposal for ward 4.

Table14.20: Development Proposals for ward 04

ID	Type of facility	Ward no	Mouza Name	Plot no	Area (Acre)
WC_04	Ward Center	4	Khepupara	844-46	0.71
GY_04	Graveyard	4	Khepupara	849-52,865-67,888	3.486
SM_04	Shaheed Minar	4	Khepupara	833	0.489
WT_04	Waste Transfer Station	4	Khepupara	838,842	0.107
				Total	**4.792**

Map 14.12 represents development proposal of ward 4.

Map 14.12 : Development Proposal for Ward no. 4



Legend

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- Mosque
- Waste Transfer Station
- Dumping Site
- Electric Sub-Station
- Police Station
- Post Office
- Pourashava office
- Temple
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14.7 Ward Action Plan for Ward No. 05

14.7.1 Demography

Ward No. 5 is located on the Northern part of the town. It has a moderate density of population. Table 14.21 shows the detail.

Table 14.21: Population Statistics of Ward No. 05

Item	Year			
	2016	**2021**	**2026**	**2031**
Area (acre)	57.56	57.56	57.56	57.56
Population	1366	1565	1792	2052
Density of Population (acre)	24	27	31	36

14.7.2 Ward Action Plan Proposals

14.7.2.1 Review of Existing Land Use

This ward is urban in character. Out of total 57.56 acre of land i.e. 56.17% is used as residential use. Only 27.38% use is agricultural. Water bodies occupy 8.51% land of the ward. At present no land is used in commercial purpose whereas only 2.46% is used as circulation network.

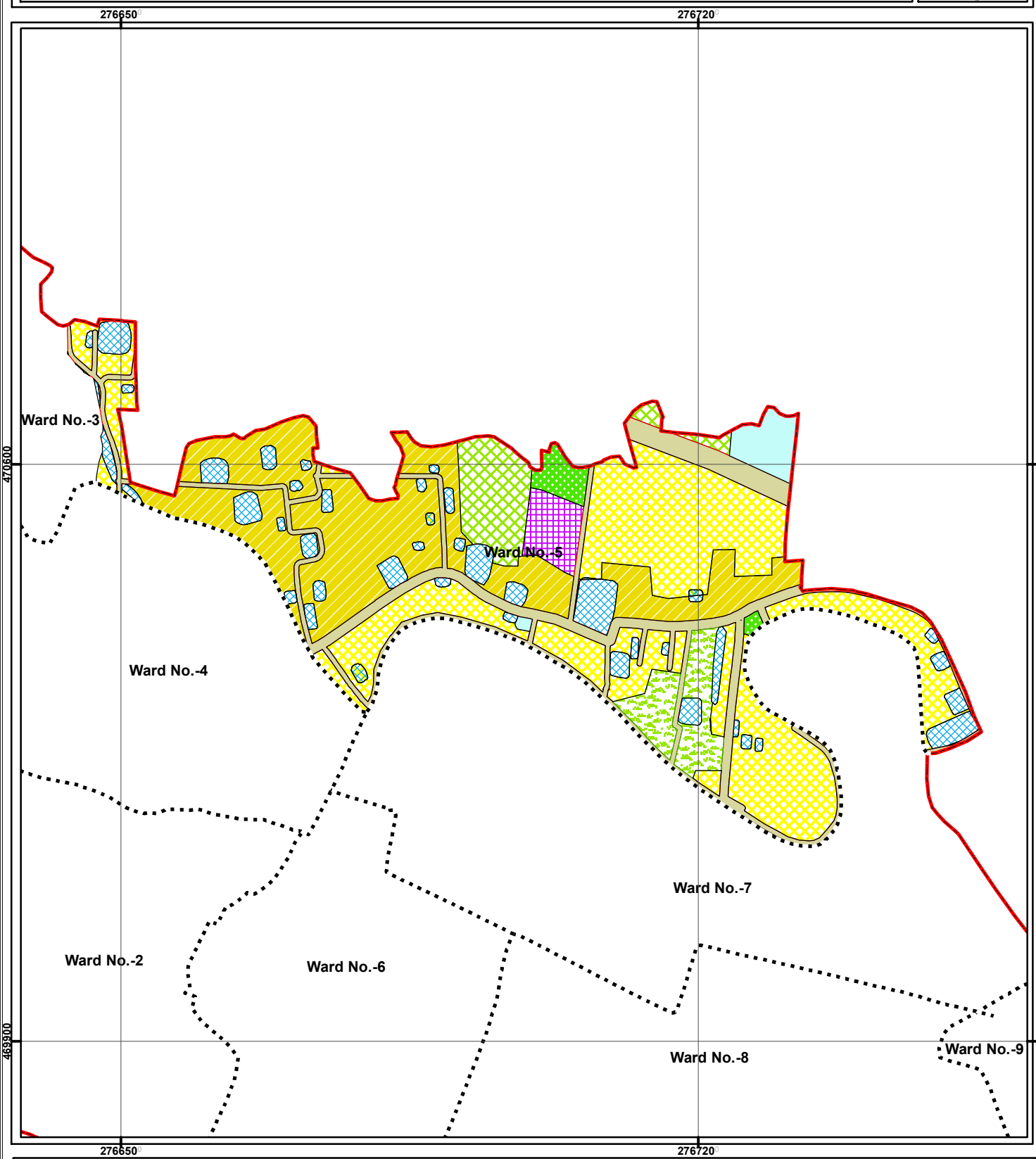
14.7.2.2 Proposed Land Use Zoning

The category wise proposals are presented here. Table 14.22 shows the amount of land existing and proposed uses in Ward no. 5. **Map 14.13** shows proposed land use of Ward 05.

Table 14.22: Comparative Scenario of Existing Land Use and Proposed Land Use of Ward No. 05

Sl. No.	Landuse (Existing)	Area (Acre)	%	Sl. No.	Landuse (Proposed)	Area (Acre)	%
1	Agriculture	15.76	27.38	1	Administrative	1.35	2.34
2	Circulation Network	1.41	2.46	2	Agriculture	3.17	5.49
3	Education & Research	0.19	0.33	3	Circulation Network	7.99	13.84
4	Open Space	2.97	5.16	4	Education & Research	0.88	1.52
5	Residential	32.33	56.17	5	Open Space	2.58	4.47
6	Waterbody	4.90	8.51	6	Rural Settlement	14.74	25.55
				7	Residential	20.46	35.46
				8	Utility Service	1.29	2.24
				9	Waterbody	5.24	9.08
	Total	**57.56**	**100**		**Total**	**57.69**	**100**

Map 14.13 : Landuse Plan of Ward no. 5



Legend

- Paurashava Boundary
- Ward Boundary Poly
- Mouza Boundary

- Administrative
- Agriculture
- Circulation Network
- Commercial Activity
- Community Facility
- Education & Research
- Health Facility
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- Recreational Facilities
- Rural Settlement
- Transportation Facilities
- Urban Deferred
- Urban Settlement
- Utility Facility
- Waterbody

0 25 50 100 150 200 Meters

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a. Residential Zone

In existing land uses, the residential has been considered as residential use as a whole. In Ward Action Plan, more than 35.20 acre of land has been earmarked for urban residential use which will occupy 61.02% of the total land.

b. Circulation network

For any type of development, circulation network is an important facility. To improve the efficiency of transport network of the ward, more roads are proposed which will consume almost 7.99 acres of land and more than 13.85% of the total area.

c. Administrative Area

2.34% land has been allocated for administrative purpose. Ward councilor's office has been proposed in this ward.

d. Education and Research

In Ward Action Plan, 1.52% of total land has been allocated for education.

e. Utility Service

A total of 1.56 acre of land covering 2.24% of total land is earmarked as Utility Services zone at Ward no. 05. Proposal is made for the establishment of one waste transfer station in this zone.

f. Recreational Facilities

A total 1.90% land has been allocated in this purpose.

g. Open Space

No land is proposed for this purpose.

h. Agricultural Area

The total area under this use has been estimated as about 3.17 acres of land covering 5.49% of the total land. Rural homestead will also perform some agricultural activities as farm, poultry or horticulture. This zone will serve as the hinterland for the town.

i. Water bodies

The plan suggests for preserving most of the water bodies for two purposes, first, to serve as source of water, second to serve as water retention area during monsoon. The ponds will be preserved as the water retention ponds. The proposed retention area covers 5.24 acres of land which covers almost 9.08% of the total ward area.

14.7.2.3 Proposed Road Infrastructure Development

Total 3.77 km road development proposal have been proposed in first Ward Action Plan for Ward no. 05. All tertiary roads covering length of 2.89 km have RoW from 20 ft to 30 ft. Secondary road covers 0.67 km having width of 40ft and Primary road covers 0.21 km having width of 80ft. Detail scenario of road network development proposal was given in Table 14.23.

Table 14.23: Road Network Proposal at Ward no. 05

Proposed Road ID	Type	Remark	Existing Width (ft)	Proposed Width (ft)	Length in (m)	Phase
PR-3	Primary Road	New	0	80	213.29	2nd Phase
SR-11	Secondary Road	Extended	10	40	668.23	2nd Phase
TR-1	Tertiary Road	Extended	8	30	24.72	3rd Phase
TR-90	Tertiary Road	Extended	8	20	529.78	3rd Phase
TR-92	Tertiary Road	Extended	6	20	3.44	3rd Phase
TR-122	Tertiary Road	Extended	6	20	96.53	3rd Phase

Proposed Road ID	Type	Remark	Existing Width (ft)	Proposed Width (ft)	Length in (m)	Phase
TR-123	Tertiary Road	Extended	6	20	48.26	3rd Phase
TR-124	Tertiary Road	Extended	6	20	50.86	3rd Phase
TR-139	Tertiary Road	Extended	6	20	211.51	3rd Phase
TR-140	Tertiary Road	Extended	6	20	400.00	3rd Phase
TR-141	Tertiary Road	Extended	8	20	79.33	3rd Phase
TR-146	Tertiary Road	Extended	6	20	333.60	3rd Phase
TR-268	Tertiary Road	Extended	6	20	65.42	3rd Phase
TR-269	Tertiary Road	Extended	6	20	175.41	3rd Phase
TR-295	Tertiary Road	New	0	20	64.77	3rd Phase
TR-298	Tertiary Road	New	0	20	38.65	3rd Phase
TR-319	Tertiary Road	New	0	20	195.59	3rd Phase
TR-324	Tertiary Road	New	0	20	572.83	3rd Phase
				Total	**3772.24**	

- "SR" for Secondary Road and TR" for Tertiary Road

14.7.2.4 Drainage Development Plan

There are both natural and manmade drainage facilities at ward no. 05. Existing drainage is mostly depending on natural drainage facilities; the proposed drainage facilities will be developed based on this natural channel. These natural channels will be served as primary drain which will be connected with 1.37 km secondary drain and 2.62 km tertiary drain in first Ward Action Plan. Table 14.24 shows the detail.

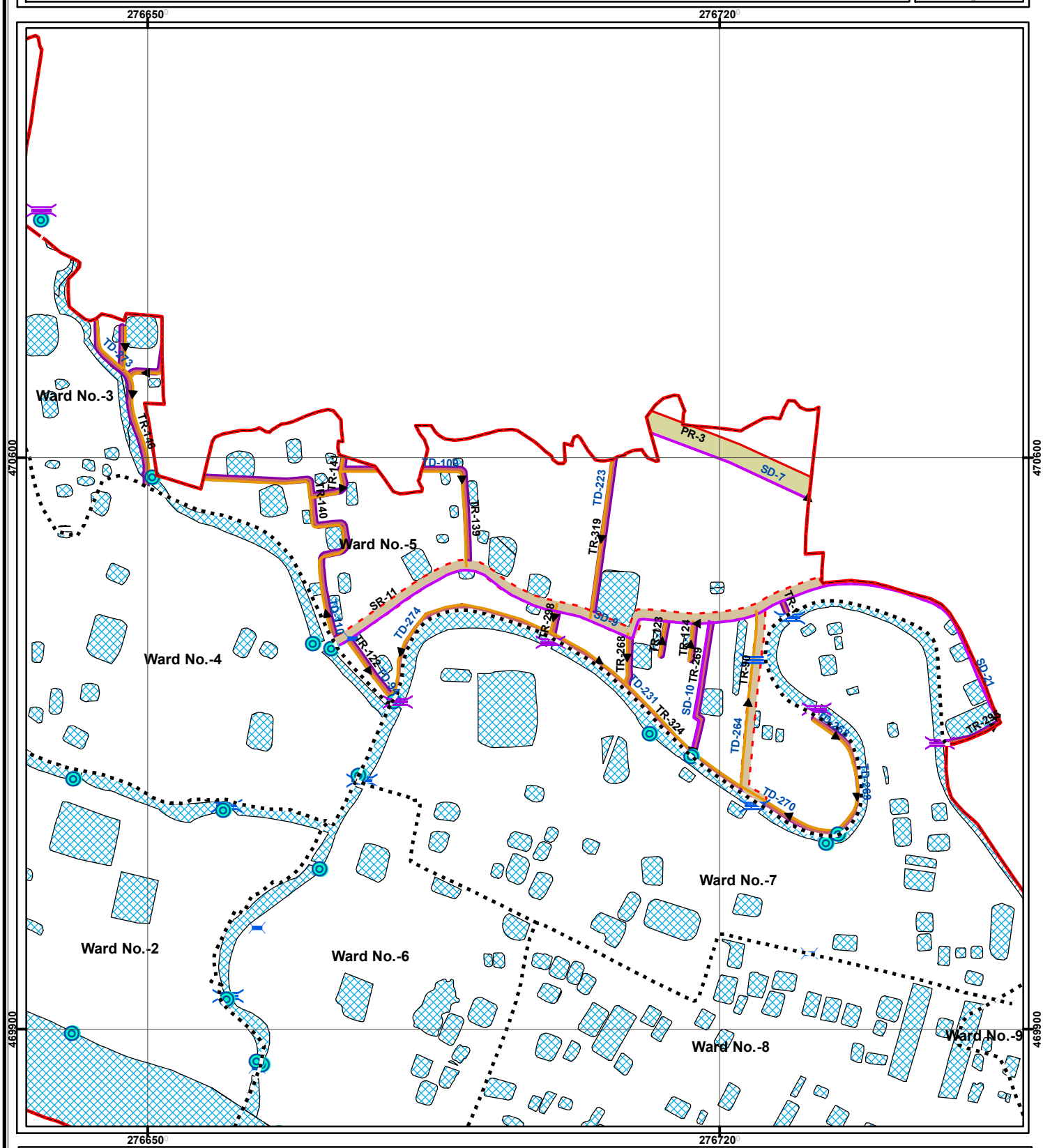
Table 14.24: Drainage Development Plan Proposals for ward 05

Drain ID	Type	Width	Depth	Length (M)	Phasing
SD-10	Secondary Drain	2.5-3.5	1.25-2.25	172.61	1st Phase
SD-21	Secondary Drain	2.5-3.5	1.25-2.25	164.18	1st Phase
SD-7	Secondary Drain	2.5-3.5	1.25-2.25	215.56	1st Phase
SD-9	Secondary Drain	2.5-3.5	1.25-2.25	816.25	1st Phase
Sub-Total				**1368.6**	
TD-109	Tertiary Drain	2-2.5	.64-1.25	214.51	2nd Phase
TD-110	Tertiary Drain	2-2.5	.64-1.25	395.58	2nd Phase
TD-111	Tertiary Drain	2-2.5	.64-1.25	82.93	2nd Phase
TD-183	Tertiary Drain	2-2.5	.64-1.25	62.16	3rd Phase
TD-202	Tertiary Drain	2-2.5	.64-1.25	29.89	3rd Phase
TD-204	Tertiary Drain	2-2.5	.64-1.25	36.80	3rd Phase
TD-223	Tertiary Drain	2-2.5	.64-1.25	197.29	3rd Phase
TD-231	Tertiary Drain	2-2.5	.64-1.25	461.80	3rd Phase
TD-261	Tertiary Drain	2-2.5	.64-1.25	0.74	3rd Phase
TD-264	Tertiary Drain	2-2.5	.64-1.25	217.45	3rd Phase
TD-265	Tertiary Drain	2-2.5	.64-1.25	0.16	3rd Phase
TD-266	Tertiary Drain	2-2.5	.64-1.25	0.53	3rd Phase
TD-267	Tertiary Drain	2-2.5	.64-1.25	7.27	3rd Phase
TD-268	Tertiary Drain	2-2.5	.64-1.25	73.01	3rd Phase
TD-269	Tertiary Drain	2-2.5	.64-1.25	88.63	3rd Phase
TD-270	Tertiary Drain	2-2.5	.64-1.25	134.70	3rd Phase
TD-271	Tertiary Drain	2-2.5	.64-1.25	52.89	3rd Phase
TD-272	Tertiary Drain	2-2.5	.64-1.25	44.63	3rd Phase
TD-273	Tertiary Drain	2-2.5	.64-1.25	212.58	3rd Phase
TD-274	Tertiary Drain	2-2.5	.64-1.25	114.07	3rd Phase
TD-94	Tertiary Drain	2-2.5	.64-1.25	92.05	2nd Phase
TD-95	Tertiary Drain	2-2.5	.64-1.25	48.26	2nd Phase
TD-96	Tertiary Drain	2-2.5	.64-1.25	50.86	2nd Phase
Sub-Total				**2618.79**	
			Total	**3987.39**	

Besides, it will be necessary to re-excavate the khals that serve as primary drains.

Map 14.14 represents proposed Road and Drainage Network for ward 5.

Map 14.14 : Road & Drainage Network for Ward no. 5



Legend

- Paurashava Boundary
- Ward Boundary Poly
- Mouza Boundary
- Proposed Outfall
- Bridge
- Culvert
- Proposed Bridge
- Primary Road
- Secondary Road
- Tertiary Road
- Walkway
- Primary Drain
- Secondary Drain
- Tertiary Drain
- Proposed Waterbody

0 35 70 140 210 280 Meters

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14.7.2.5 Urban Services

a. Solid Waste Management

Solid waste management is an important urban service. As density of population increases the volume of solid waste also increases proportionately. This ward will be developed as an industrial area. However, the income level is also another major factor influencing the volume of solid waste. Population and the volume of waste in the town are yet to be large enough to become a problem for it. But the present management system is not satisfactory and it might be led to problem in future. The consultant proposes one solid waste transfer station in this ward at on an area of 0.07 acre. It is recommended that home collection system is introduced in the ward by creation of local CBOs. This will cause organized collection of waste and prevent indiscriminate littering.

b. Water Supply

It is proposed to install a network based water supply system by exploring fresh water from the Andharmanik River for the entire Paurashava. And water supply lines in this ward will be established along all categories of roads as per the growth of the settlement.

c. Sanitation

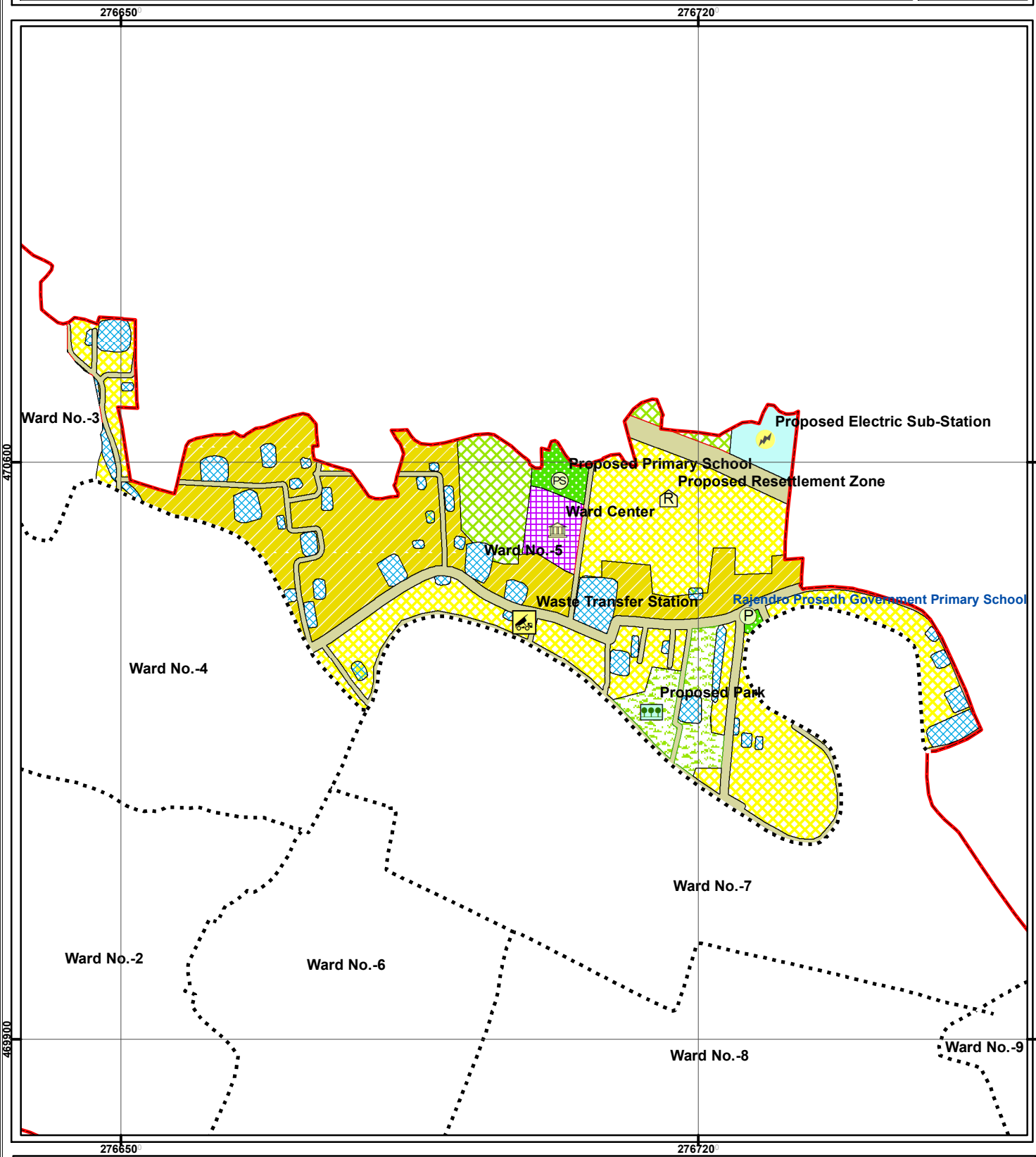
It is apprehended that the government would not be able to provide network and treatment based sanitation system for the town. So the present system of sanitation will continue. However, the Paurashava must try to promote hygienic sanitation to ensure better public health. There is hardly any public toilet in the town to serve the visitors and the local people. The existing toilet of bus terminal area has to be developed as public toilet is required for the town people and as well as for the passengers waiting for departure. **Map 14.15** represents proposed Urban service proposal for ward 5.

Table14.25: Development Proposals for ward 05

ID	Type of facility	Ward no	Mouza Name	Plot no	Area (Acre)
RZ_05	Resettlement Zone	5	Khepupara	499,500-12,514	7.64
WC_05	Ward Center	5	Khepupara	460,514	1.35
PS_05	Primary School cum Cyclone Shelter	5	Khepupara	460, 514-516	0.76
ES_05	Electric Sub-Station	5	Khepupara	499, 501-502	1.22
PP_05	Park	5	Khepupara	461,475-82, 503-04	1.09
WT_05	Waste Transfer Station	5	Khepupara	473-74	0.07
				Total	**12.13**

Map 14.15 represents development proposals of ward 5

Map 14.15 : Development Proposal for Ward no. 5



Legend

- Paurashava Boundary
- Ward Boundary Poly
- Mouza Boundary
- College
- Panir Tanki
- Eidgah
- Ferry Ghat
- Fire Service
- Helipad
- Cinema Hall
- Ghat
- Government Office
- Primary School
- High School
- Hospital/Clinic
- Kheya Ghat
- Madrasa
- Market
- Monument
- Mosque
- Waste Transfer Station
- Dumping Site
- Electric Sub-Station
- Police Station
- Post Office
- Pourashava office
- Temple
- Upazilla Parishad
- Auditorium
- Clinic
- Cyclone Shelter
- Ward Center
- Low Income Housing
- Market
- Park
- Primary School
- Resettlement Zone
- Rickshaw/Tempo Stand
- Secondary School
- Shamshan Ghat
- Stadium
- Truck Terminal

0 35 70 140 210 280 Meters

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14.8 Ward Action Plan for Ward No. 06

14.8.1 Demography

Ward No. 6 is located on the middle east-southern part of the town. It is the smallest ward in the whole Paurashava. It has the highest density of population within the Paurashava. Table 14.26 shows detail.

Table 14.26: Population Statistics of Ward No. 06

Item	Year			
	2016	2021	2026	2031
Area (acre)	36.65	36.65	36.65	36.65
Population	1903	2180	2497	2859
Density of Population (acre)	52	59	68	78

14.8.2 Ward Action Plan Proposals

14.8.2.1 Review of Existing Land Use

Out of total 36.65 acre of land i.e. about 51.82% is used as residential use. Water bodies occupy more than 29% land of the ward. At present 4.07 acres of land are used in commercial purpose. About 4.23% is used as circulation network. Only 1.39acre of land is used as community facilities.

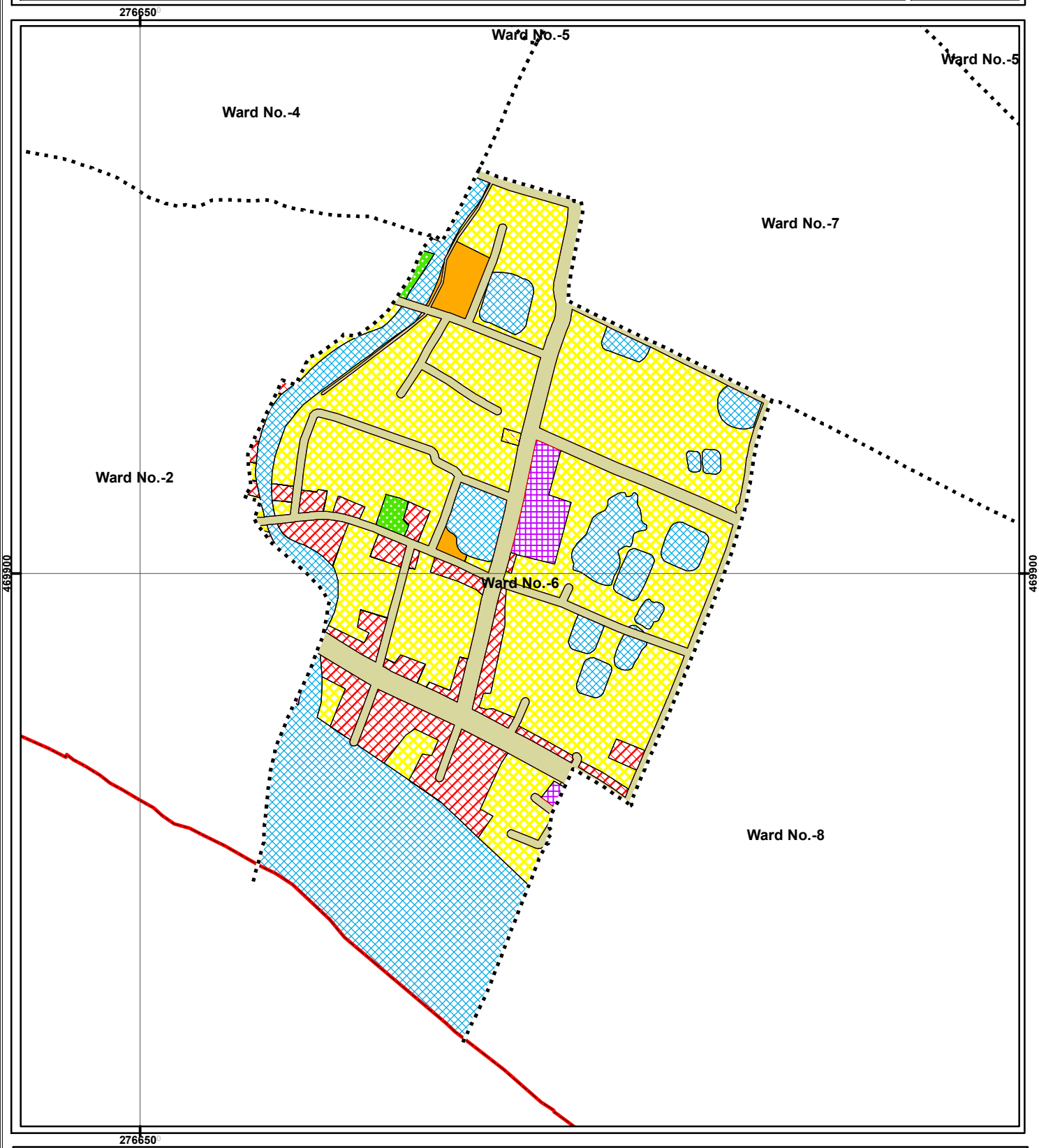
14.8.2.2 Proposed Land Use Zoning

The category wise proposals are presented here. Table 14.26 shows the amount of land existing and proposed uses in Ward no. 06. **Map 14.16** shows proposed land use of Ward 06.

Table 14.27: Comparative Scenario of Existing and Proposed Land Uses of Ward no. 06

Sl. No.	Landuse (Existing)	Area (Acre)	%	Sl. No.	Landuse (Proposed)	Area (Acre)	%
1	Administrative	0.34	0.93	1	Administrative	0.64	1.74
2	Circulation Network	1.55	4.23	2	Circulation Network	5.12	13.97
3	Commercial Activity	4.07	11.12	3	Commercial Activity	3.10	8.45
4	Community Facility	0.51	1.39	4	Community Facility	0.42	1.16
5	Education & Research	0.19	0.51	5	Education & Research	0.17	0.46
6	Mixed	0.01	0.03	6	Mixed	0.01	0.03
7	Residential	18.99	51.82	7	Residential	16.74	45.64
8	Transportation & Communication	0.01	0.03	8	Transportation & Communication	0.01	0.01
9	Waterbody	10.98	29.96	9	Waterbody	10.47	28.54
	Total	**36.65**	**100**		**Total**	**36.65**	**100**

Map 14.16 : Landuse Plan of Ward no. 6



Legend

- Paurashava Boundary
- Ward Boundary Poly
- Mouza Boundary

- Administrative
- Agriculture
- Circulation Network
- Commercial Activity
- Community Facility
- Education & Research
- Health Facility
- Industrial
- Mixed Use
- Open Space
- Recreational Facilities
- Rural Settlement
- Transportation Facilities
- Urban Deferred
- Urban Settlement
- Utility Facility
- Waterbody

Meters
0 15 30 60 90 120

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a. Urban Residential Zone

In existing land uses, the urban residential has been considered as residential use as a whole. In Ward Action Plan, more than 16.74 acre of land has been earmarked for urban residential use which will occupy 45.64% of the total land.

b. Circulation network

For any type of development, circulation network is an important facility. To improve the efficiency of transport network of the ward, more roads are proposed which will consume almost 5.12 acres of land and more than 13.97% of the total area.

c. Administrative Area

1.74 % land has been allocated for administrative purpose. Ward councilor's office and a police box have been proposed in this ward.

d. Commercial Activity

At present, commercial activity and density of population are moderate in this ward. Only 3.10 acres of land has been allocated for this purpose which will occupy only 8.45 % of total land. Additionally, other commercial functions are provided at mixed use zone, along with administrative and community facilities for this ward.

e. Education and Research

In Ward Action Plan, 0.46% of total land has been allocated for education.

f. Community Facilities

Land for community facilities will be 0.42 acre which is 1.16%.

g. Mixed Use Zone

Total 0.01% land has been allocated in this ward.

h. Transport and Communication

Total 0.01 acre land has been allocated in this ward.

i. Water bodies

The plan suggests for preserving most of the water bodies for two purposes, first, to serve as source of water, second to serve as water retention area during monsoon. The ponds will be preserved as the water retention ponds. The proposed retention area covers 10.47 acres of land which covers almost 28.54% of the total ward area.

14.8.2.3 Proposed Road Infrastructure Development

Total 2.71 km road development proposal have been proposed for Ward no. 06. Length of tertiary roads is 3.61 km and width of these roads will be 20 ft to 30 ft. Length of Secondary road is 0.48 km and width is 40 ft. and Length of Primary road is 0.21 km and width is 60 ft. Length of walkway is 0.43 km with a width of 6ft has been proposed. Detail scenario of road network development proposal was given in Table 14.28.

Table 14.28: Road Network Proposal at Ward no. 06

Proposed Road ID	Type	Remark	Existing Width (ft)	Proposed Width (ft)	Length in (m)	Phase
PR-4	Primary Road	Extended	16	60	213.14	1st Phase
				Sub-Total	**213.14**	
SR-5	Secondary Road	Extended	10	40	3.54	1st Phase

Proposed Road ID	Type	Remark	Existing Width (ft)	Proposed Width (ft)	Length in (m)	Phase
SR-6	Secondary Road	Extended	8	40	396.21	1st Phase
SR-7	Secondary Road	Extended	10	40	75.29	1st Phase
SR-5	Secondary Road	Extended	10	40	0.51	2nd Phase
				Sub-Total	**475.55**	
TR-2	Tertiary Road	Extended	10	30	170.59	3rd Phase
TR-4	Tertiary Road	Extended	10	30	2.12	3rd Phase
TR-52	Tertiary Road	Extended	10	20	25.51	2nd Phase
TR-82	Tertiary Road	Extended	6	20	55.21	3rd Phase
TR-83	Tertiary Road	Extended	8	20	51.01	3rd Phase
TR-84	Tertiary Road	Extended	6	20	37.22	3rd Phase
TR-85	Tertiary Road	Extended	6	20	16.93	3rd Phase
TR-97	Tertiary Road	Extended	10	20	323.09	3rd Phase
TR-98	Tertiary Road	Extended	6	20	2.64	3rd Phase
TR-101	Tertiary Road	Extended	6	20	169.65	3rd Phase
TR-110	Tertiary Road	Extended	4	20	10.22	3rd Phase
TR-111	Tertiary Road	Extended	6	20	29.85	3rd Phase
TR-112	Tertiary Road	Extended	6	20	100.32	3rd Phase
TR-115	Tertiary Road	Extended	6	20	248.29	3rd Phase
TR-116	Tertiary Road	Extended	4	20	60.44	3rd Phase
TR-117	Tertiary Road	Extended	10	20	123.67	3rd Phase
TR-119	Tertiary Road	Extended	6	20	136.02	3rd Phase
TR-121	Tertiary Road	Extended	6	20	77.07	3rd Phase
TR-289	Tertiary Road	Extended	10	20	164.21	3rd Phase
TR-327	Tertiary Road	Extended	8	20	0.62	3rd Phase
TR-2	Tertiary Road	Extended	10	30	170.59	3rd Phase
TR-4	Tertiary Road	Extended	10	30	2.12	3rd Phase
TR-52	Tertiary Road	Extended	10	20	25.51	2nd Phase
TR-82	Tertiary Road	Extended	6	20	55.21	3rd Phase
TR-83	Tertiary Road	Extended	8	20	51.01	3rd Phase
TR-84	Tertiary Road	Extended	6	20	37.22	3rd Phase
TR-85	Tertiary Road	Extended	6	20	16.93	3rd Phase
TR-97	Tertiary Road	Extended	10	20	323.09	3rd Phase
TR-98	Tertiary Road	Extended	6	20	2.64	3rd Phase
TR-101	Tertiary Road	Extended	6	20	169.65	3rd Phase
TR-110	Tertiary Road	Extended	4	20	10.22	3rd Phase
TR-111	Tertiary Road	Extended	6	20	29.85	3rd Phase
TR-112	Tertiary Road	Extended	6	20	100.32	3rd Phase
TR-115	Tertiary Road	Extended	6	20	248.29	3rd Phase
TR-116	Tertiary Road	Extended	4	20	60.44	3rd Phase
TR-117	Tertiary Road	Extended	10	20	123.67	3rd Phase
TR-119	Tertiary Road	Extended	6	20	136.02	3rd Phase
TR-121	Tertiary Road	Extended	6	20	77.07	3rd Phase
TR-289	Tertiary Road	Extended	10	20	164.21	3rd Phase
TR-327	Tertiary Road	Extended	8	20	0.62	3rd Phase
				Sub-Total	**3609.36**	
TR-333	Walkway	New	0	6	215.97	3rd Phase
TR-333	Walkway	New	0	6	215.97	3rd Phase
				Sub-Total	**431.94**	
				Grand Total	**2709.34**	

- "SR" for Secondary Road and TR" for Tertiary Road and Walkway

14.8.2.4 Drainage Development Plan

The proposed drainage facilities will be 4.56 km. Out of total 0.90 km served as secondary drain and 3.66 km served as tertiary drain in first Ward Action Plan of Ward No-06. Table 14.29 shows the detail.

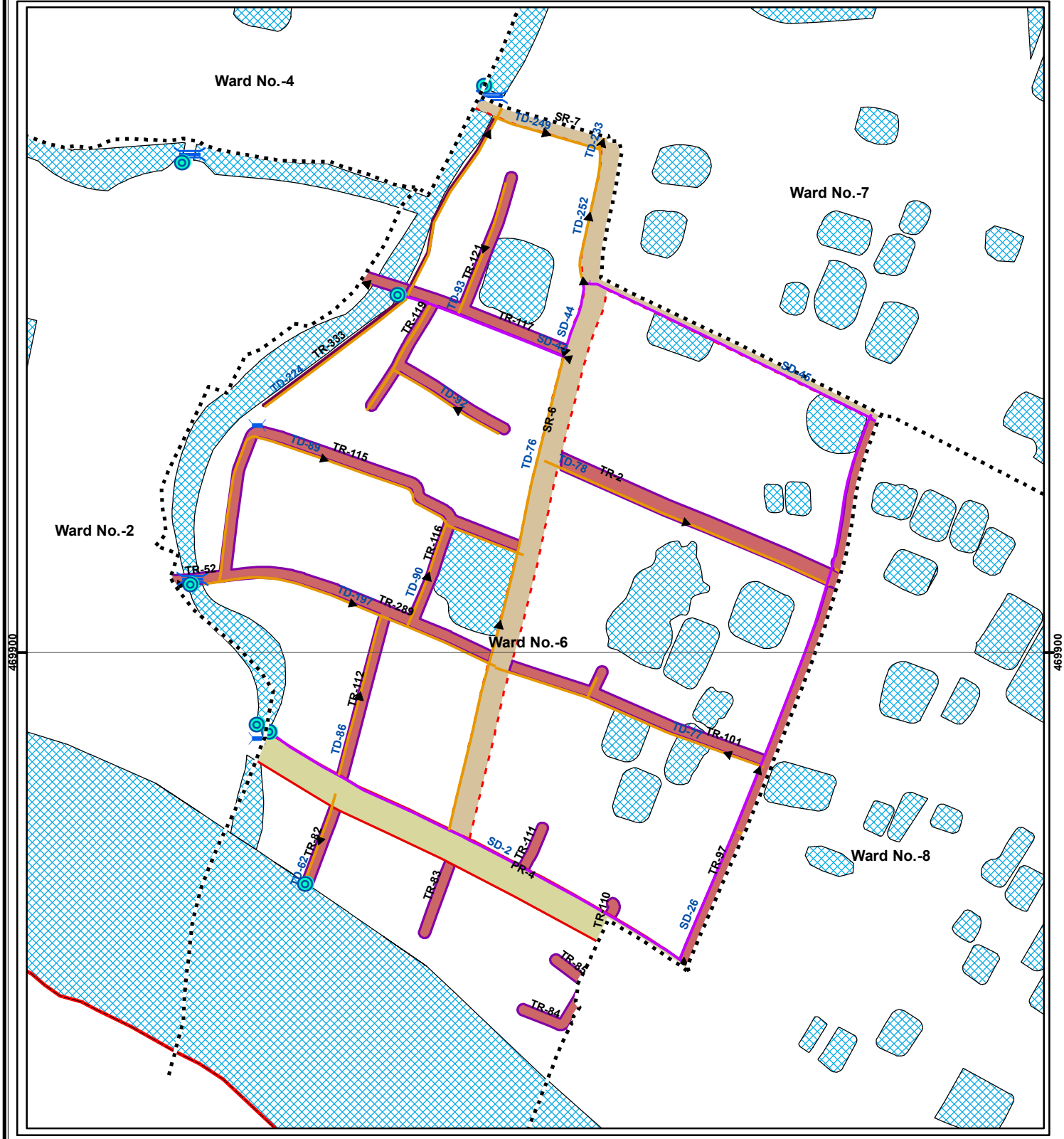
Table 14.29: Drainage Development Plan Proposals for ward 06

Drain ID	Type	Width	Depth	Length (M)	Phasing
SD-2	Secondary Drain	2.5-3.5	1.25-2.25	260.38	1st Phase
SD-26	Secondary Drain	2.5-3.5	1.25-2.25	317.69	1st Phase
SD-42	Secondary Drain	2.5-3.5	1.25-2.25	0.09	2nd Phase
SD-43	Secondary Drain	2.5-3.5	1.25-2.25	97.16	2nd Phase
SD-44	Secondary Drain	2.5-3.5	1.25-2.25	43.11	2nd Phase
SD-45	Secondary Drain	2.5-3.5	1.25-2.25	175.44	2nd Phase
SD-46	Secondary Drain	2.5-3.5	1.25-2.25	0.07	2nd Phase
SD-48	Secondary Drain	2.5-3.5	1.25-2.25	3.95	2nd Phase
Sub-Total				**897.89**	
TD-197	Tertiary Drain	2-2.5	.64-1.25	169.93	3rd Phase
TD-224	Tertiary Drain	2-2.5	.64-1.25	216.81	3rd Phase
TD-233	Tertiary Drain	2-2.5	.64-1.25	7.70	3rd Phase
TD-238	Tertiary Drain	2-2.5	.64-1.25	6.63	3rd Phase
TD-249	Tertiary Drain	2-2.5	.64-1.25	62.55	3rd Phase
TD-252	Tertiary Drain	2-2.5	.64-1.25	74.79	3rd Phase
TD-282	Tertiary Drain	2-2.5	.64-1.25	4.12	3rd Phase
TD-34	Tertiary Drain	2-2.5	.64-1.25	6.54	2nd Phase
TD-62	Tertiary Drain	2-2.5	.64-1.25	55.21	2nd Phase
TD-73	Tertiary Drain	2-2.5	.64-1.25	4.10	2nd Phase
TD-76	Tertiary Drain	2-2.5	.64-1.25	268.40	2nd Phase
TD-77	Tertiary Drain	2-2.5	.64-1.25	169.65	2nd Phase
TD-78	Tertiary Drain	2-2.5	.64-1.25	170.59	2nd Phase
TD-86	Tertiary Drain	2-2.5	.64-1.25	90.52	2nd Phase
TD-89	Tertiary Drain	2-2.5	.64-1.25	248.29	2nd Phase
TD-90	Tertiary Drain	2-2.5	.64-1.25	60.44	2nd Phase
TD-92	Tertiary Drain	2-2.5	.64-1.25	136.02	2nd Phase
TD-93	Tertiary Drain	2-2.5	.64-1.25	77.07	2nd Phase
TD-197	Tertiary Drain	2-2.5	.64-1.25	169.93	3rd Phase
TD-224	Tertiary Drain	2-2.5	.64-1.25	216.81	3rd Phase
TD-233	Tertiary Drain	2-2.5	.64-1.25	7.70	3rd Phase
TD-238	Tertiary Drain	2-2.5	.64-1.25	6.63	3rd Phase
TD-249	Tertiary Drain	2-2.5	.64-1.25	62.55	3rd Phase
TD-252	Tertiary Drain	2-2.5	.64-1.25	74.79	3rd Phase
TD-282	Tertiary Drain	2-2.5	.64-1.25	4.12	3rd Phase
TD-34	Tertiary Drain	2-2.5	.64-1.25	6.54	2nd Phase
TD-62	Tertiary Drain	2-2.5	.64-1.25	55.21	2nd Phase
TD-73	Tertiary Drain	2-2.5	.64-1.25	4.10	2nd Phase
TD-76	Tertiary Drain	2-2.5	.64-1.25	268.40	2nd Phase
TD-77	Tertiary Drain	2-2.5	.64-1.25	169.65	2nd Phase
TD-78	Tertiary Drain	2-2.5	.64-1.25	170.59	2nd Phase
TD-86	Tertiary Drain	2-2.5	.64-1.25	90.52	2nd Phase
TD-89	Tertiary Drain	2-2.5	.64-1.25	248.29	2nd Phase
TD-90	Tertiary Drain	2-2.5	.64-1.25	60.44	2nd Phase
TD-92	Tertiary Drain	2-2.5	.64-1.25	136.02	2nd Phase
TD-93	Tertiary Drain	2-2.5	.64-1.25	77.07	2nd Phase
Sub-Total				**3658.72**	
			Grand Total	**4556.61**	

Besides, it will be necessary to re-excavate the khals that serve as primary drains.

Map 14.17 represents proposed Road and Drainage Network Map of Ward 6.

Map 14.17 : Road & Drainage Network for Ward no. 6



Legend

- Paurashava Boundary
- Ward Boundary Poly
- Mouza Boundary
- Proposed Outfall
- Bridge
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- Proposed Bridge
- Primary Road
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In Association with

14.8.2.5 Urban Services

a. Solid Waste Management

The consultant proposes no solid waste transfer stations in this ward no. 06. It is recommended that home collection system is introduced in the ward by creation of local CBOs. Table 14.30 shows the detail.

b. Water Supply

It is proposed to install a network based water supply system by exploring fresh water from the Andharmanik River for the entire Paurashava.

c. Sanitation

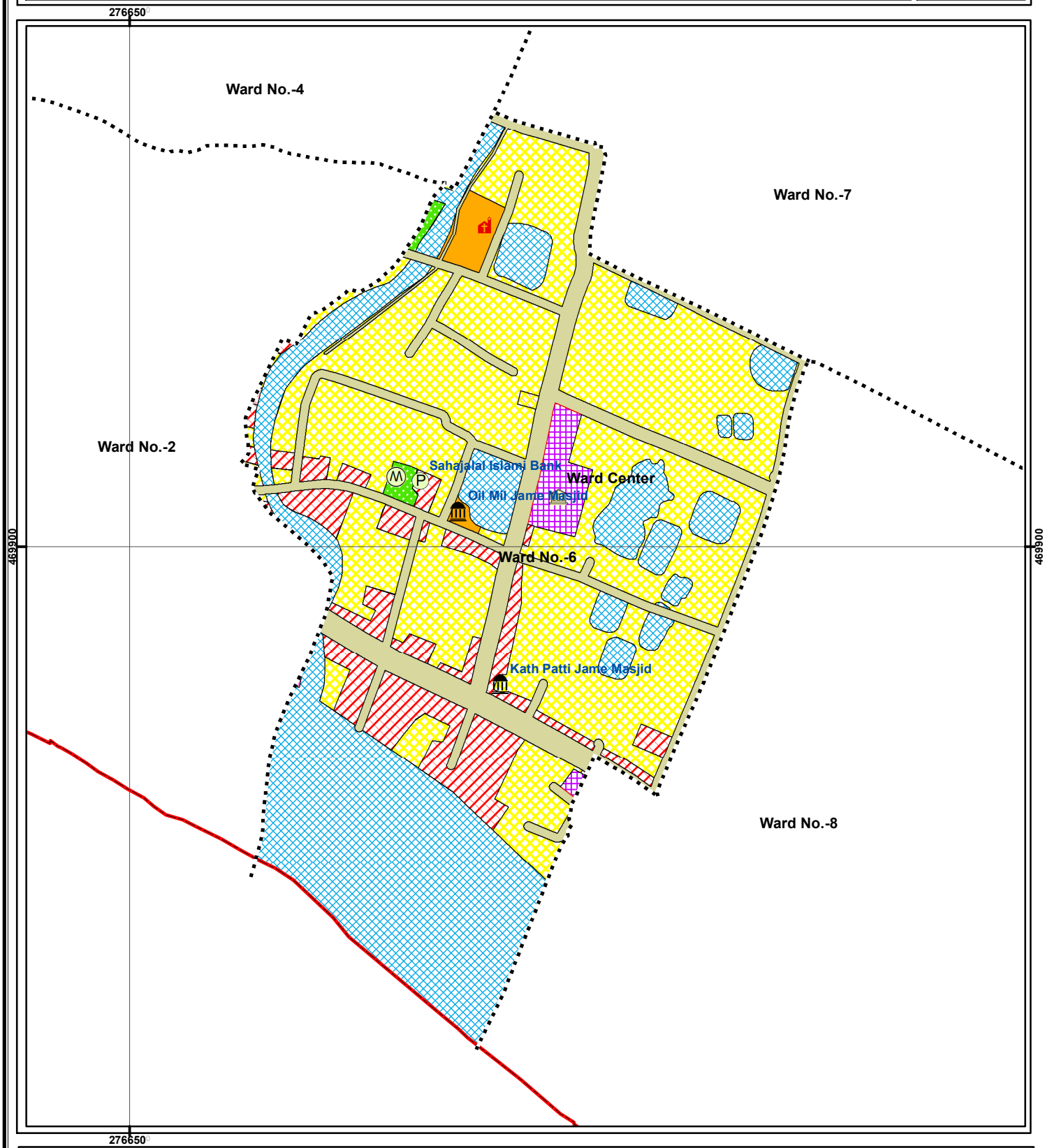
The Paurashava must try to promote hygienic sanitation for the whole Paurashavsa to ensure better public health.

Table 14.30: Development Proposals for ward 06

ID	Type of facility	Ward no	Mouza Name	Plot no	Area (Acre)
WC_06	Ward Center	6	Khepupara	958-60,986	0.42

Map 14.18 represents development proposals of ward 6

Map 14.18 : Development Proposal for Ward no. 6



Legend

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- Ward Boundary Poly
- Mouza Boundary
- College
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- Eidgah
- Ferry Ghat
- Fire Service
- Helipad
- Cinema Hall
- Ghat
- Government Office
- Primary School
- High School
- Hospital/Clinic
- Kheya Ghat
- Madrasa
- Market
- Monument
- Mosque
- Waste Transfer Station
- Dumping Site
- Electric Sub-Station
- Police Station
- Post Office
- Pourashava office
- Temple
- Upazilla Parishad
- Auditorium
- Clinic
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- Secondary School
- Shamshan Ghat
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- Truck Terminal

0 35 70 140 210 280 Meters

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14.9 Ward Action Plan for Ward No. 07

14.9.1 Demography

Ward no.7 is located on the east-southern part of the town. Population projection shows that 2317 people would be in the ward in the year 2031. The density of population is the moderate in this ward with 39 persons per acre. Table 14.31 shows the details.

Table 14.31: Population Statistics of Ward No. 07

Item	Year			
	2016	**2021**	**2026**	**2031**
Area (acre)	59.04	59.04	59.04	59.04
Population	1543	1767	2023	2317
Density of Population (acre)	26	30	34	39

14.9.2 Ward Action Plan Proposals

14.9.2.1 Review of Existing Land Use

Out of total 59.04 acres of land about 65.02% is used as residential use. The next use is waterbody, more than 11 acres of land are used in this purpose. Agriculture occupies about 2.36% land of the ward. More than 2.36% is used as circulation network.

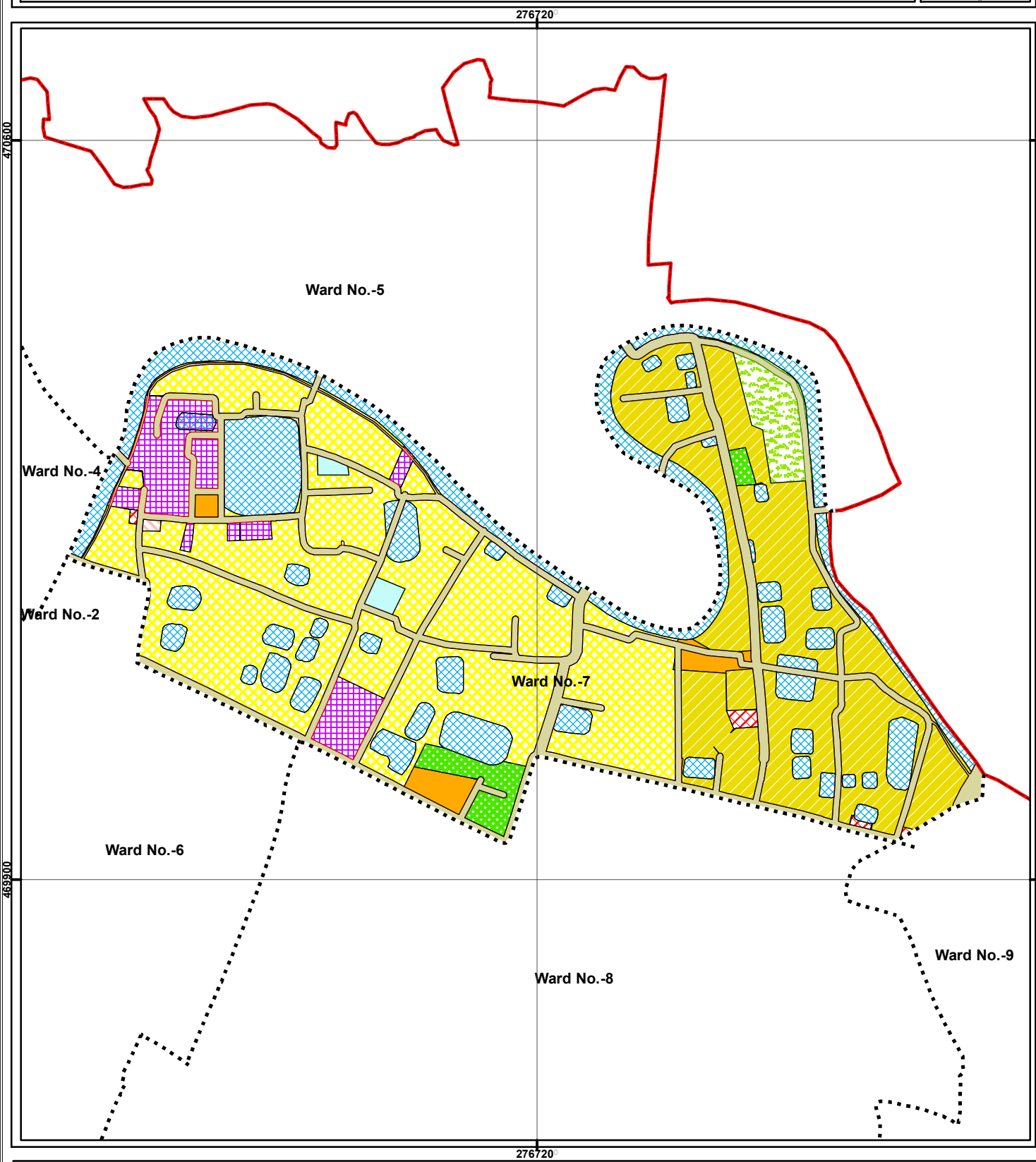
14.9.2.2 Proposed Land Use Zoning

The category wise proposals are presented here. Table 14.32 shows the amount of land existing and proposed uses in Ward no. 7. **Map 14.19** shows proposed land use of Ward 07

Table 14.32: Comparative Existing Land Use and Proposed Land Use of Ward No. 07

Sl. No.	Landuse (Existing)	Area (Acre)	%	Sl. No.	Landuse (Proposed)	Area (Acre)	%
1	Administrative	2.38	4.03	1	Administrative	2.80	4.74
2	Agriculture	1.39	2.36	2	Circulation Network	9.01	15.23
3	Circulation Network	2.34	3.97	3	Commercial Activity	0.18	0.30
4	Commercial Activity	0.23	0.39	4	Community Facility	0.80	1.35
5	Community Facility	1.08	1.83	5	Education & Research	1.01	1.71
6	Education & Research	1.22	2.07	6	Mixed	0.04	0.07
7	Mixed	0.06	0.10	7	Open Space	1.15	1.95
8	Open Space	0.00	0.00	8	Rural Settlement	11.98	20.25
9	Residential	38.39	65.02	9	Residential	20.41	34.50
10	Waterbody	11.95	20.24	10	Utility Service	0.29	0.49
				11	Waterbody	11.47	19.39
	Total	**59.04**	**100**		**Total**	**59.04**	**100**

Map 14.19 : Landuse Plan of Ward no. 7



Legend

- Paurashava Boundary
- Ward Boundary Poly
- Mouza Boundary

- Administrative
- Agriculture
- Circulation Network
- Commercial Activity
- Community Facility
- Education & Research
- Health Facility
- Industrial
- Mixed Use
- Open Space
- Recreational Facilities
- Rural Settlement
- Transportation Facilities
- Urban Deferred
- Urban Settlement
- Utility Facility
- Waterbody

0 15 30 60 90 120 Meters

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a. Residential Zone

In existing land uses, urban residential has been considered as residential use as a whole. In Ward Action Plan, more than 32.38 acre of land has been earmarked for urban residential use which will occupy 54.76% of the total land.

b. Circulation network

For any type of development, circulation network is an important facility. To improve the efficiency of transport network of the ward, more roads are proposed which will consume almost 9.01 acres of land and more than 15.23% of the total area.

c. Administrative Area

4.74% land has been allocated for administrative purpose. Ward councilor's office and a police box have been proposed in this ward.

d. Commercial Activity

At present, commercial activity and density of population are moderate in this ward. Only 0.18 acres of land has been allocated for this purpose which will occupy only 0.30 % of total land. Additionally, other commercial functions are provided at mixed use zone, along with administrative and community facilities for this ward. A neighborhood market has been proposed.

e. Education and Research

In Ward Action Plan, 1.71% of total land has been allocated for education.

f. Community Facilities

Land for community facilities will be 0.80 acre which is 1.35 %.

g. Utility Service

A total of 0.29 acre of land covering 0.49% of total land is earmarked as Utility Services zone at Ward no. 07. One waste transfer station has been proposed here.

h. Mixed Use Zone

A total of 0.04 acres of land will be used as mixed use. A ward center will be established which will serve this ward having administrative, commercial and community facilities.

i. Recreational Facilities

No land is proposed for this purpose.

j. Open Space

Land for Open space will be 1.15 acre which includes open recreational facilities playground, Local Park, green belt and Neighborhood Park.

k. Water bodies

The plan suggests for preserving most of the water bodies for two purposes, first, to serve as source of water, second to serve as water retention area during monsoon. The ponds will be preserved as the water retention ponds. The proposed retention area covers 11.47 acres of land which covers almost 19.39% of the total ward area.

14.9.2.3 Proposed Road Infrastructure Development

Total 5.97 km road development proposal have been proposed in ward action plan for ward no. 07. Length of the tertiary road will be 9.61km of 20 ft width. Total length of secondary road will be 0.83

km and width of these roads will be 40 ft and Total length of Primary road will be 0.04 km and width of these roads will be 80 ft for this ward. There is 0.59 km walkway proposal. Detail scenario of road network development proposal was given in Table 14.33.

Table 14.33: Road Network Proposal at Ward no. 07

Proposed Road ID	Type	Remark	Existing Width (ft)	Proposed Width (ft)	Length in (m)	Phase
PR-2	Primary Road	Extended	10	80	40.51	1st Phase
				Sub-Total	**40.51**	
SR-5	Secondary Road	Extended	10	40	647.81	1st Phase
SR-5	Secondary Road	Extended	10	40	176.59	1st Phase
SR-7	Secondary Road	Extended	10	40	1.43	1st Phase
SR-5	Secondary Road	Extended	10	40	0.51	2nd Phase
				Sub-Total	**826.34**	
TR-1	Tertiary Road	Extended	8	30	478.59	3rd Phase
TR-88	Tertiary Road	Extended	8	20	97.69	3rd Phase
TR-89	Tertiary Road	Extended	8	20	45.55	3rd Phase
TR-90	Tertiary Road	Extended	8	20	181.01	3rd Phase
TR-91	Tertiary Road	Extended	6	20	263.97	3rd Phase
TR-92	Tertiary Road	Extended	6	20	74.54	3rd Phase
TR-93	Tertiary Road	Extended	6	20	79.14	3rd Phase
TR-97	Tertiary Road	Extended	10	20	1.46	3rd Phase
TR-102	Tertiary Road	Extended	8	20	241.68	3rd Phase
TR-103	Tertiary Road	Extended	6	20	92.35	3rd Phase
TR-104	Tertiary Road	Extended	8	20	339.14	3rd Phase
TR-105	Tertiary Road	Extended	6	20	39.75	3rd Phase
TR-106	Tertiary Road	Extended	8	20	776.10	3rd Phase
TR-107	Tertiary Road	Extended	6	20	27.41	3rd Phase
TR-108	Tertiary Road	Extended	8	20	61.16	3rd Phase
TR-109	Tertiary Road	Extended	6	20	89.40	3rd Phase
TR-122	Tertiary Road	Extended	6	20	15.28	3rd Phase
TR-212	Tertiary Road	Extended	6	20	110.56	3rd Phase
TR-223	Tertiary Road	Extended	6	20	38.69	3rd Phase
TR-249	Tertiary Road	Extended	8	20	324.91	3rd Phase
TR-250	Tertiary Road	Extended	6	20	106.09	3rd Phase
TR-253	Tertiary Road	Extended	6	20	134.94	3rd Phase
TR-255	Tertiary Road	Extended	6	20	45.98	3rd Phase
TR-284	Tertiary Road	Extended	6	20	43.39	3rd Phase
TR-285	Tertiary Road	Extended	6	20	25.56	3rd Phase
TR-295	Tertiary Road	New	0	20	16.23	3rd Phase
TR-296	Tertiary Road	New	0	20	131.43	3rd Phase
TR-297	Tertiary Road	New	0	20	178.81	3rd Phase
TR-298	Tertiary Road	New	0	20	33.00	3rd Phase
TR-300	Tertiary Road	New	0	20	36.01	3rd Phase
TR-303	Tertiary Road	New	0	20	64.47	3rd Phase
TR-304	Tertiary Road	New	0	20	225.40	3rd Phase
TR-327	Tertiary Road	Extended	8	20	89.62	3rd Phase
TR-332	Walkway	New	0	6	85.63	3rd Phase
TR-333	Walkway	New	0	6	506.44	3rd Phase
TR-1	Tertiary Road	Extended	8	30	478.59	3rd Phase
TR-88	Tertiary Road	Extended	8	20	97.69	3rd Phase
TR-89	Tertiary Road	Extended	8	20	45.55	3rd Phase
TR-90	Tertiary Road	Extended	8	20	181.01	3rd Phase
TR-91	Tertiary Road	Extended	6	20	263.97	3rd Phase
TR-92	Tertiary Road	Extended	6	20	74.54	3rd Phase
TR-93	Tertiary Road	Extended	6	20	79.14	3rd Phase
TR-97	Tertiary Road	Extended	10	20	1.46	3rd Phase
TR-102	Tertiary Road	Extended	8	20	241.68	3rd Phase
TR-103	Tertiary Road	Extended	6	20	92.35	3rd Phase
TR-104	Tertiary Road	Extended	8	20	339.14	3rd Phase
TR-105	Tertiary Road	Extended	6	20	39.75	3rd Phase

Proposed Road ID	Type	Remark	Existing Width (ft)	Proposed Width (ft)	Length in (m)	Phase
TR-106	Tertiary Road	Extended	8	20	776.10	3rd Phase
TR-107	Tertiary Road	Extended	6	20	27.41	3rd Phase
TR-108	Tertiary Road	Extended	8	20	61.16	3rd Phase
TR-109	Tertiary Road	Extended	6	20	89.40	3rd Phase
TR-122	Tertiary Road	Extended	6	20	15.28	3rd Phase
TR-212	Tertiary Road	Extended	6	20	110.56	3rd Phase
TR-223	Tertiary Road	Extended	6	20	38.69	3rd Phase
TR-249	Tertiary Road	Extended	8	20	324.91	3rd Phase
TR-250	Tertiary Road	Extended	6	20	106.09	3rd Phase
TR-253	Tertiary Road	Extended	6	20	134.94	3rd Phase
TR-255	Tertiary Road	Extended	6	20	45.98	3rd Phase
TR-284	Tertiary Road	Extended	6	20	43.39	3rd Phase
TR-285	Tertiary Road	Extended	6	20	25.56	3rd Phase
TR-295	Tertiary Road	New	0	20	16.23	3rd Phase
TR-296	Tertiary Road	New	0	20	131.43	3rd Phase
TR-297	Tertiary Road	New	0	20	178.81	3rd Phase
TR-298	Tertiary Road	New	0	20	33.00	3rd Phase
TR-300	Tertiary Road	New	0	20	36.01	3rd Phase
TR-303	Tertiary Road	New	0	20	64.47	3rd Phase
TR-304	Tertiary Road	New	0	20	225.40	3rd Phase
TR-327	Tertiary Road	Extended	8	20	89.62	3rd Phase
				Sub-Total	**9610.69**	
TR-332	Walkway	New	0	6	85.63	3rd Phase
TR-333	Walkway	New	0	6	506.44	3rd Phase
				Sub-Total	**592.07**	
				Grand Total	**5968.23**	

- "SR" for Secondary Road and TR" for Tertiary Road and Walkway

14.9.2.4 Drainage Development Plan

There are both manmade and natural drainage facilities at ward no. 07. Existing drainage is mostly depending on natural drainage facilities; Andharmanik River which is passing the ward .The proposed drainage facilities will be developed based on these natural channels and served as primary drain for the ward and will be connected with 0.48 km secondary drain and 4.49 km tertiary drain. Table 14.34 shows the detail.

Table 14.34: Drainage Development Plan Proposals for ward 07

Drain ID	Type	Width	Depth	Length (M)	Phasing
SD-10	Secondary Drain	2.5-3.5	1.25-2.25	2.81	1st Phase
SD-25	Secondary Drain	2.5-3.5	1.25-2.25	140.04	1st Phase
SD-28	Secondary Drain	2.5-3.5	1.25-2.25	1.50	1st Phase
SD-29	Secondary Drain	2.5-3.5	1.25-2.25	129.35	1st Phase
SD-30	Secondary Drain	2.5-3.5	1.25-2.25	25.34	1st Phase
SD-31	Secondary Drain	2.5-3.5	1.25-2.25	19.98	1st Phase
SD-46	Secondary Drain	2.5-3.5	1.25-2.25	119.26	2nd Phase
SD-5	Secondary Drain	2.5-3.5	1.25-2.25	39.25	1st Phase
SD-51	Secondary Drain	2.5-3.5	1.25-2.25	0.07	2nd Phase
			Sub-Total	**477.6**	
TD-157	Tertiary Drain	2-2.5	.64-1.25	122.79	3rd Phase
TD-162	Tertiary Drain	2-2.5	.64-1.25	35.26	3rd Phase
TD-173	Tertiary Drain	2-2.5	.64-1.25	321.30	3rd Phase
TD-174	Tertiary Drain	2-2.5	.64-1.25	107.95	3rd Phase
TD-176	Tertiary Drain	2-2.5	.64-1.25	42.57	3rd Phase
TD-194	Tertiary Drain	2-2.5	.64-1.25	41.88	3rd Phase
TD-202	Tertiary Drain	2-2.5	.64-1.25	19.93	3rd Phase
TD-203	Tertiary Drain	2-2.5	.64-1.25	163.01	3rd Phase
TD-206	Tertiary Drain	2-2.5	.64-1.25	36.01	3rd Phase
TD-209	Tertiary Drain	2-2.5	.64-1.25	64.47	3rd Phase

Drain ID	Type	Width	Depth	Length (M)	Phasing
TD-210	Tertiary Drain	2-2.5	.64-1.25	225.40	3rd Phase
TD-224	Tertiary Drain	2-2.5	.64-1.25	505.59	3rd Phase
TD-233	Tertiary Drain	2-2.5	.64-1.25	84.04	3rd Phase
TD-239	Tertiary Drain	2-2.5	.64-1.25	22.09	3rd Phase
TD-240	Tertiary Drain	2-2.5	.64-1.25	114.29	3rd Phase
TD-247	Tertiary Drain	2-2.5	.64-1.25	239.03	3rd Phase
TD-262	Tertiary Drain	2-2.5	.64-1.25	22.71	3rd Phase
TD-263	Tertiary Drain	2-2.5	.64-1.25	37.72	3rd Phase
TD-66	Tertiary Drain	2-2.5	.64-1.25	88.88	2nd Phase
TD-67	Tertiary Drain	2-2.5	.64-1.25	45.55	2nd Phase
TD-68	Tertiary Drain	2-2.5	.64-1.25	263.83	2nd Phase
TD-69	Tertiary Drain	2-2.5	.64-1.25	467.16	2nd Phase
TD-70	Tertiary Drain	2-2.5	.64-1.25	55.42	2nd Phase
TD-71	Tertiary Drain	2-2.5	.64-1.25	79.14	2nd Phase
TD-79	Tertiary Drain	2-2.5	.64-1.25	92.35	2nd Phase
TD-80	Tertiary Drain	2-2.5	.64-1.25	216.68	2nd Phase
TD-81	Tertiary Drain	2-2.5	.64-1.25	39.75	2nd Phase
TD-82	Tertiary Drain	2-2.5	.64-1.25	776.10	2nd Phase
TD-83	Tertiary Drain	2-2.5	.64-1.25	27.41	2nd Phase
TD-84	Tertiary Drain	2-2.5	.64-1.25	61.16	2nd Phase
TD-85	Tertiary Drain	2-2.5	.64-1.25	67.92	2nd Phase
TD-94	Tertiary Drain	2-2.5	.64-1.25	0.13	2nd Phase
			Sub-Total	**4487.52**	
			Total	**4965.12**	

Besides, it will be necessary to re-excavate the khals that serve as primary drains flowing of Water through them.

Map 14.20 represents proposed Road and Drainage Network for Ward 7.

14.9.2.5 Urban Services

a. Solid Waste Management

The consultant proposes solid waste transfer stations in some suitable locations for the management of solid waste. It is recommended that home collection system is introduced in the ward by creation of local CBOs. This will cause organized collection of waste and prevent indiscriminate littering.

b. Water Supply

It is proposed to install a network based water supply system by exploring fresh water from the Andharmanik River for the entire Paurashava.

c. Sanitation

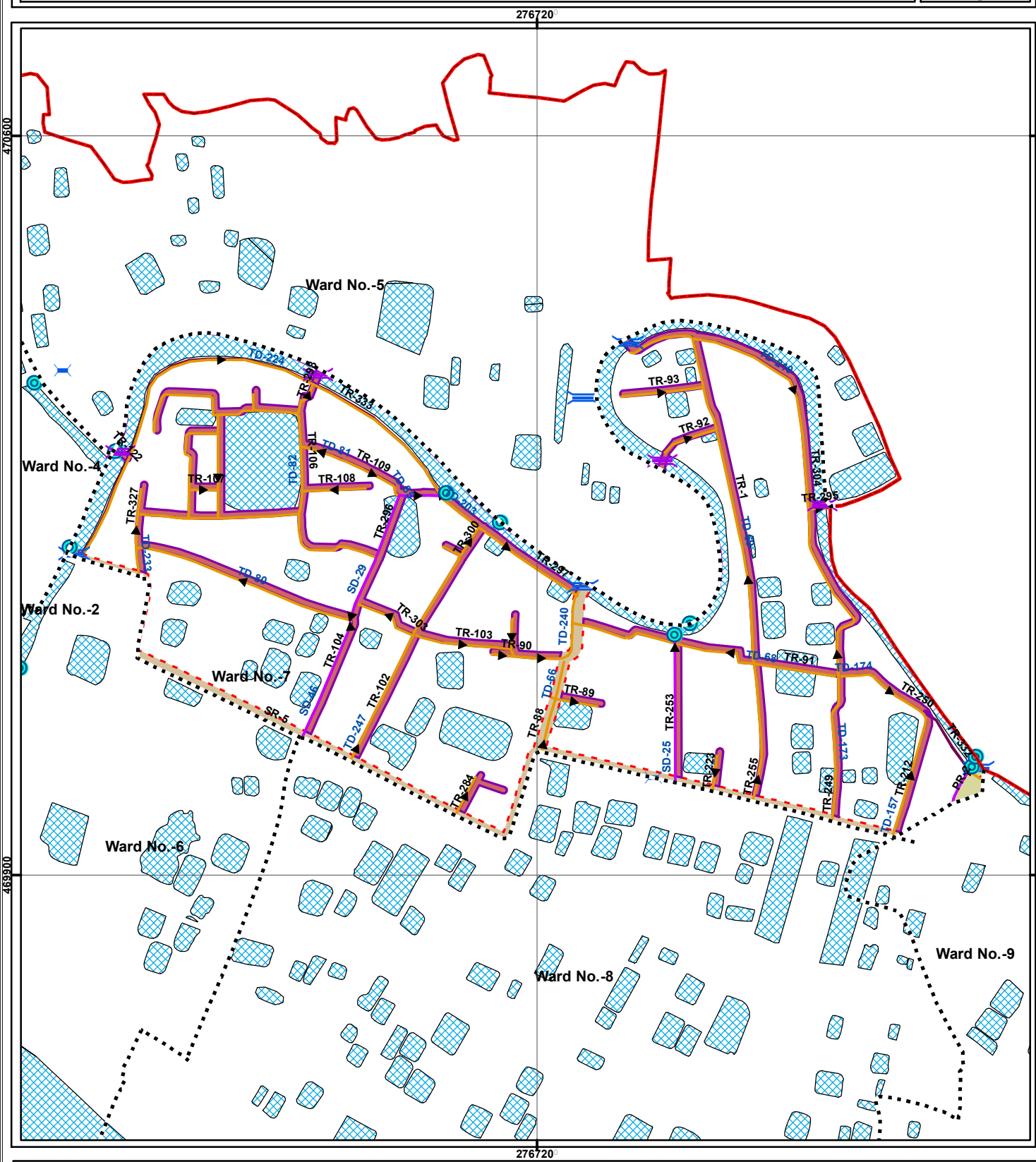
The Paurashava must try to promote hygienic sanitation for the whole Paurashava to ensure better public health.

Table 14.35: Development Proposals for ward 07

ID	Type of facility	Ward no	Mouza Name	Plot no	Area (Acre)
WC_07	Ward Center	7	Khepupara	961	0.74
PP_07	Park	7	Khepupara	1012	1.15
WT_07	Waste Transfer Station	7	Khepupara	986	0.195
				Total	**2.085**

Map 14.21 represents development proposals for ward 7.

Map 14.20 : Road & Drainage Network for Ward no. 7



Legend

- Paurashava Boundary
- Ward Boundary Poly
- Mouza Boundary
- Proposed Outfall
- Bridge
- Culvert
- Proposed Bridge
- Primary Road
- Secondary Road
- Tertiary Road
- Walkway
- Primary Drain
- Secondary Drain
- Tertiary Drain
- Proposed Waterbody

0 35 70 140 210 280 Meters

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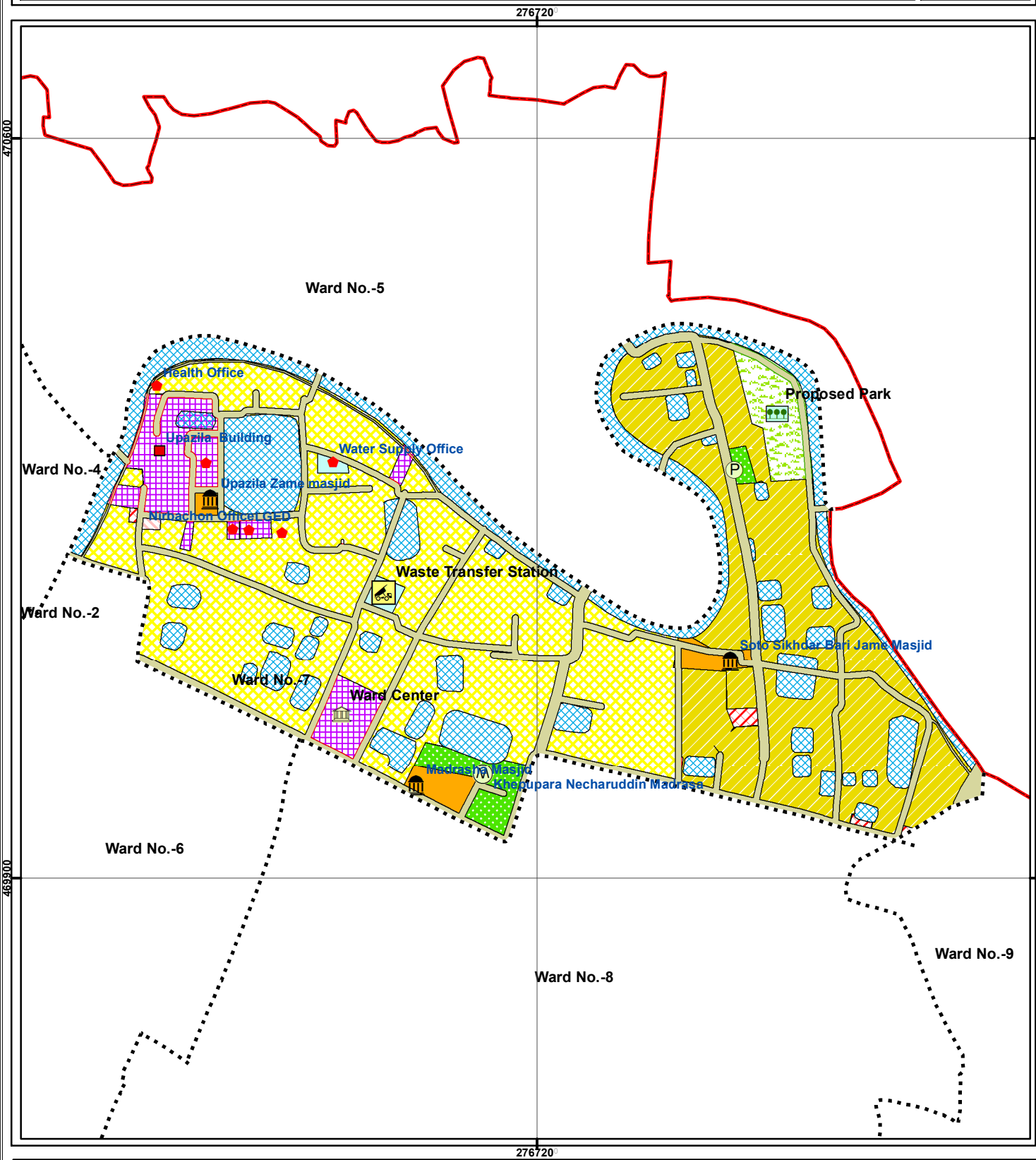
Map 14.21 : Development Proposal for Ward no. 7



Legend

- Paurashava Boundary
- Ward Boundary Poly
- Mouza Boundary
- College
- Panir Tanki
- Eidgah
- Ferry Ghat
- Fire Service
- Helipad
- Cinema Hall
- Ghat
- Government Office
- Primary School
- High School
- Hospital/Clinic
- Kheya Ghat
- Madrasa
- Market
- Monument
- Mosque
- Waste Transfer Station
- Dumping Site
- Electric Sub-Station
- Police Station
- Post Office
- Pourashava office
- Temple
- Upazilla Parishad
- Auditorium
- Clinic
- Cyclone Shelter
- Ward Center
- Low Income Housing
- Market
- Park
- Primary School
- Resettlement Zone
- Rickshaw/Tempo Stand
- Secondary School
- Shamshan Ghat
- Stadium
- Truck Terminal

0 35 70 140 210 280 Meters

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14.10 Ward Action Plan for Ward No. 08

14.10.1 Demography

Ward No. 8 is located on the southern part of the town. It has a moderate density of population. The estimated population for the year 2031 will be 3138 with a density of 33 persons per acre. Table 14.36 shows the detail.

Table 14.36: Population Statistics of Ward No. 08

Item	Year			
	2016	**2026**	**2026**	**2031**
Area (acre)	94.65	94.65	94.65	94.65
Population	2089	2392	2740	3138
Density of Population (acre)	22	25	29	33

14.10.2 Ward Action Plan Proposals

14.10.2.1 Review of Existing Land Use

Ward no. 08 is mainly urban in character. Out of total 94.65 acre of land of this ward more than 52.83 acre of land i.e. 55.82% is used as residential. 0.48 acre is used as agricultural purpose. It occupies almost 0.51% of total land. Water bodies occupy about 28.16% land. More than 3.45% is used as circulation network. Only 0.05 % of land is used as Community facilities.

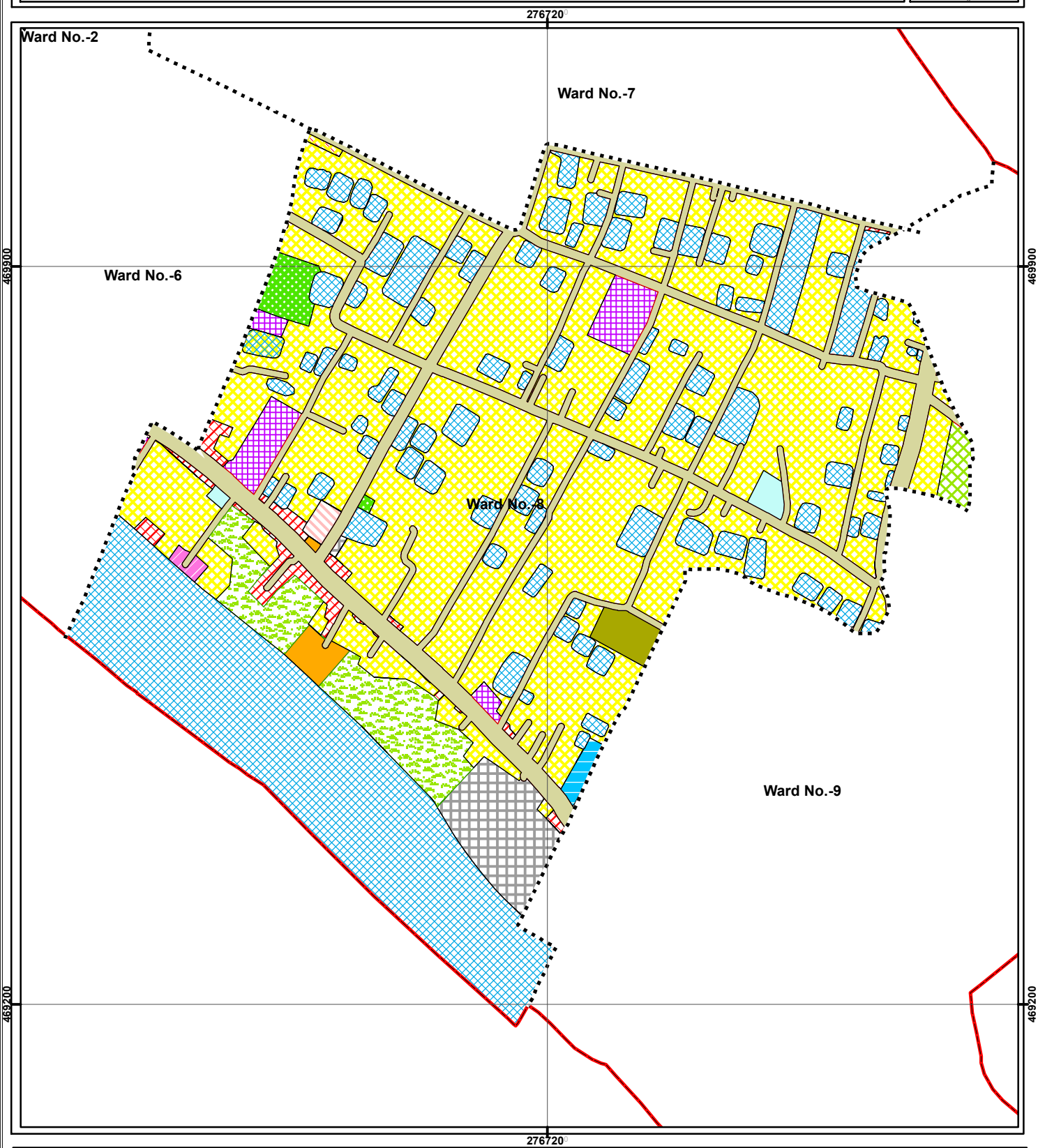
14.10.2.2 Proposed Land Use Zoning

The category wise proposals are presented here. Table 14.37 shows the amount of land existing and proposed uses in Ward no. 8. **Map 14.22** shows proposed land use of Ward 08

Table 14.37: Comparative Scenario of Existing and Proposed Land Uses of Ward No. 08

Sl. No.	Landuse (Existing)	Area (Acre)	%	Sl. No.	Landuse (Proposed)	Area (Acre)	%
1	Administrative	1.15	1.22	1	Administrative	1.73	1.83
2	Agriculture	0.48	0.51	2	Agriculture	0.46	0.49
3	Circulation Network	3.27	3.45	3	Circulation Network	12.83	13.54
4	Commercial Activity	2.38	2.52	4	Commercial Activity	1.18	1.24
5	Community Facility	0.05	0.05	5	Community Facility	0.46	0.48
6	Education & Research	0.62	0.66	6	Education & Research	0.59	0.62
7	Industrial	2.47	2.61	7	Health Facility	0.54	0.57
8	Mixed	0.22	0.23	8	Industrial	2.37	2.50
9	Open Space	4.12	4.35	9	Mixed	0.20	0.21
10	Recreational Facility	0.26	0.28	10	Open Space	3.66	3.87
11	Residential	52.83	55.82	11	Recreational Facility	0.24	0.26
12	Transportation & Communication	0.15	0.16	12	Residential	43.87	46.32
13	Waterbody	26.65	28.16	13	Transportation & Communication	0.13	0.14
				14	Utility Service	0.30	0.32
				15	Waterbody	26.15	27.61
	Total	**94.65**	**100**		**Total**	**94.65**	**100**

Map 14.22 : Landuse Plan of Ward no. 8



Legend

- Paurashava Boundary
- Ward Boundary Poly
- Mouza Boundary

- Administrative
- Agriculture
- Circulation Network
- Commercial Activity
- Community Facility
- Education & Research
- Health Facility
- Industrial
- Mixed Use
- Open Space
- Recreational Facilities
- Rural Settlement
- Transportation Facilities
- Urban Deferred
- Urban Settlement
- Utility Facility
- Waterbody

0 15 30 60 90 120 Meters

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a. Urban Residential Zone

In existing land uses, the urban residential has been considered as residential use as a whole. In Ward Action Plan, more than 43.87 acre of land has been earmarked for urban residential use which will occupy 46.32% of the total land.

b. Circulation network

For any type of development, circulation network is an important facility. To improve the efficiency of transport network of the ward, more roads are proposed which will consume almost 12.83 acres of land and more than 13.54% of the total area.

c. Administrative Area

1.83% land has been allocated for administrative purpose. A ward center will be established which will serve this ward having administrative, commercial and community facilities.

d. Commercial Activity

At present, commercial activity and density of population are moderate in this ward. Only 1.62 acres of land has been proposed for this purpose which will occupy only 1.24 % of total land. Additionally, other commercial functions are provided at mixed use zone, along with administrative and community facilities for this ward. Retail sale market has been proposed in this ward.

e. Education and Research

In Ward Action Plan, 0.62% of total land has been allocated for education.

f. Health Facilities

0.57% land has been allocated for health purpose. A health center has been proposed in this purpose.

g. Community Facilities

Land for community facilities will be 0.46 acre which is 0.48%. A community center has been proposed in this ward.

h. Mixed Use Zone

A total of 0.20 acres of land will be used as mixed use.

i. Open Space

Land for Open space will be 3.66 acre which includes open recreational facilities playground, Local Park and green belt.

j. Agricultural Area

The total area under this use has been estimated at about 0.46 acres of land covering 0.49% of the total land. Rural homestead will also perform some agricultural activities as farm, poultry or horticulture. This zone will serve as the hinterland for the town.

k. Water bodies

The plan suggests for preserving most of the water bodies for two purposes, first, to serve as source of water, second to serve as water retention area during monsoon. The ponds will be preserved as the water retention ponds. The proposed retention area covers 26.15 acres of land which covers almost 27.61% of the total ward area.

l. Utility Service

Proposed utility service is 0.32%. An overhead tank is proposed in this ward.

14.10.2.3 Proposed Road Infrastructure Development

Total 67.41 km road development proposal have been proposed for this ward. Length of the tertiary road will be 4.51 km and width of these roads will be 20 ft to 30 ft. Total length of secondary road will be 1.49 km and width of these roads will be 40 ft and Total length of primary road will be 0.74 km and width of these roads will be 60 ft for this ward. Detail scenario of road network development proposal was given in Table 14.38.

Table 14.38: Road Network Proposal at Ward no.08 of Kalapara Paurashava

Proposed Road ID	Type	Remark	Existing Width (ft)	Proposed Width (ft)	Length in (m)	Phase
PR-4	Primary Road	Extended	16	60	546.89	1st Phase
PR-5	Primary Road	Extended	10	60	196.56	1st Phase
				Sub-Total	**743.45**	
SR-4	Secondary Road	Extended	10	40	470.85	1st Phase
SR-5	Secondary Road	Extended	10	40	365.72	1st Phase
SR-5	Secondary Road	Extended	10	40	647.81	1st Phase
SR-9	Secondary Road	Extended	6	40	3.61	1st Phase
SR-5	Secondary Road	Extended	10	40	0.51	2nd Phase
				Sub-Total	**1488.5**	
TR-4	Tertiary Road	Extended	10	30	243.02	3rd Phase
TR-84	Tertiary Road	Extended	6	20	44.65	3rd Phase
TR-85	Tertiary Road	Extended	6	20	4.96	3rd Phase
TR-86	Tertiary Road	Extended	6	20	86.80	3rd Phase
TR-87	Tertiary Road	Extended	4	20	51.61	3rd Phase
TR-95	Tertiary Road	Extended	4	20	39.10	3rd Phase
TR-96	Tertiary Road	Extended	4	20	136.33	3rd Phase
TR-97	Tertiary Road	Extended	10	20	3.56	3rd Phase
TR-98	Tertiary Road	Extended	6	20	51.65	3rd Phase
TR-99	Tertiary Road	Extended	6	20	152.77	3rd Phase
TR-100	Tertiary Road	Extended	6	20	51.54	3rd Phase
TR-110	Tertiary Road	Extended	4	20	2.94	3rd Phase
TR-153	Tertiary Road	Extended	10	20	61.11	3rd Phase
TR-200	Tertiary Road	Extended	6	20	46.94	3rd Phase
TR-213	Tertiary Road	Extended	6	20	283.37	3rd Phase
TR-214	Tertiary Road	Extended	6	20	20.68	3rd Phase
TR-218	Tertiary Road	Extended	6	20	145.23	3rd Phase
TR-219	Tertiary Road	Extended	6	20	145.79	3rd Phase
TR-220	Tertiary Road	Extended	6	20	11.84	3rd Phase
TR-221	Tertiary Road	Extended	6	20	79.32	3rd Phase
TR-222	Tertiary Road	Extended	6	20	15.70	3rd Phase
TR-224	Tertiary Road	Extended	6	20	249.26	3rd Phase
TR-225	Tertiary Road	Extended	6	20	72.04	3rd Phase
TR-226	Tertiary Road	Extended	6	20	338.93	3rd Phase
TR-228	Tertiary Road	Extended	6	20	49.01	3rd Phase
TR-229	Tertiary Road	Extended	6	20	29.77	3rd Phase
TR-230	Tertiary Road	Extended	6	20	28.39	3rd Phase
TR-231	Tertiary Road	Extended	6	20	13.51	3rd Phase
TR-232	Tertiary Road	Extended	6	20	20.83	3rd Phase
TR-233	Tertiary Road	Extended	6	20	29.57	3rd Phase
TR-234	Tertiary Road	Extended	8	20	52.47	3rd Phase
TR-235	Tertiary Road	Extended	6	20	103.05	3rd Phase
TR-236	Tertiary Road	Extended	6	20	258.52	3rd Phase
TR-237	Tertiary Road	Extended	6	20	273.98	3rd Phase
TR-238	Tertiary Road	Extended	4	20	12.94	3rd Phase
TR-239	Tertiary Road	Extended	4	20	31.47	3rd Phase
TR-240	Tertiary Road	Extended	4	20	29.56	3rd Phase
TR-241	Tertiary Road	Extended	4	20	109.23	3rd Phase
TR-242	Tertiary Road	Extended	6	20	48.23	3rd Phase
TR-243	Tertiary Road	Extended	4	20	12.98	3rd Phase
TR-244	Tertiary Road	Extended	4	20	15.37	3rd Phase

Proposed Road ID	Type	Remark	Existing Width (ft)	Proposed Width (ft)	Length in (m)	Phase
TR-245	Tertiary Road	Extended	6	20	34.61	3rd Phase
TR-246	Tertiary Road	Extended	4	20	22.38	3rd Phase
TR-247	Tertiary Road	Extended	6	20	11.73	3rd Phase
TR-248	Tertiary Road	Extended	4	20	136.58	3rd Phase
TR-251	Tertiary Road	Extended	6	20	40.02	3rd Phase
TR-252	Tertiary Road	Extended	6	20	94.62	3rd Phase
TR-254	Tertiary Road	Extended	4	20	24.65	3rd Phase
TR-256	Tertiary Road	Extended	4	20	14.46	3rd Phase
TR-270	Tertiary Road	Extended	6	20	15.48	3rd Phase
TR-311	Tertiary Road	New	0	20	188.52	3rd Phase
TR-312	Tertiary Road	New	0	20	378.95	3rd Phase
TR-326	Tertiary Road	New	0	20	89.40	3rd Phase
				Sub-Total	**4509.42**	
				Grand Total	**6741.39**	

- "SR" for Secondary Road and TR" for Tertiary Road

14.10.2.4 Drainage Development Plan

There are both natural and manmade drainage facilities at ward no. 08 of Kalapara Paurashava. Existing drainage is mostly depending on natural drainage facilities; Andharmanik River which is passing very close to the Paurashava. The proposed drainage facilities of this Ward will be developed based on this natural channel. Table 14.39 shows the detail.

Table 14.39: Drainage Development Plan Proposals for ward 08

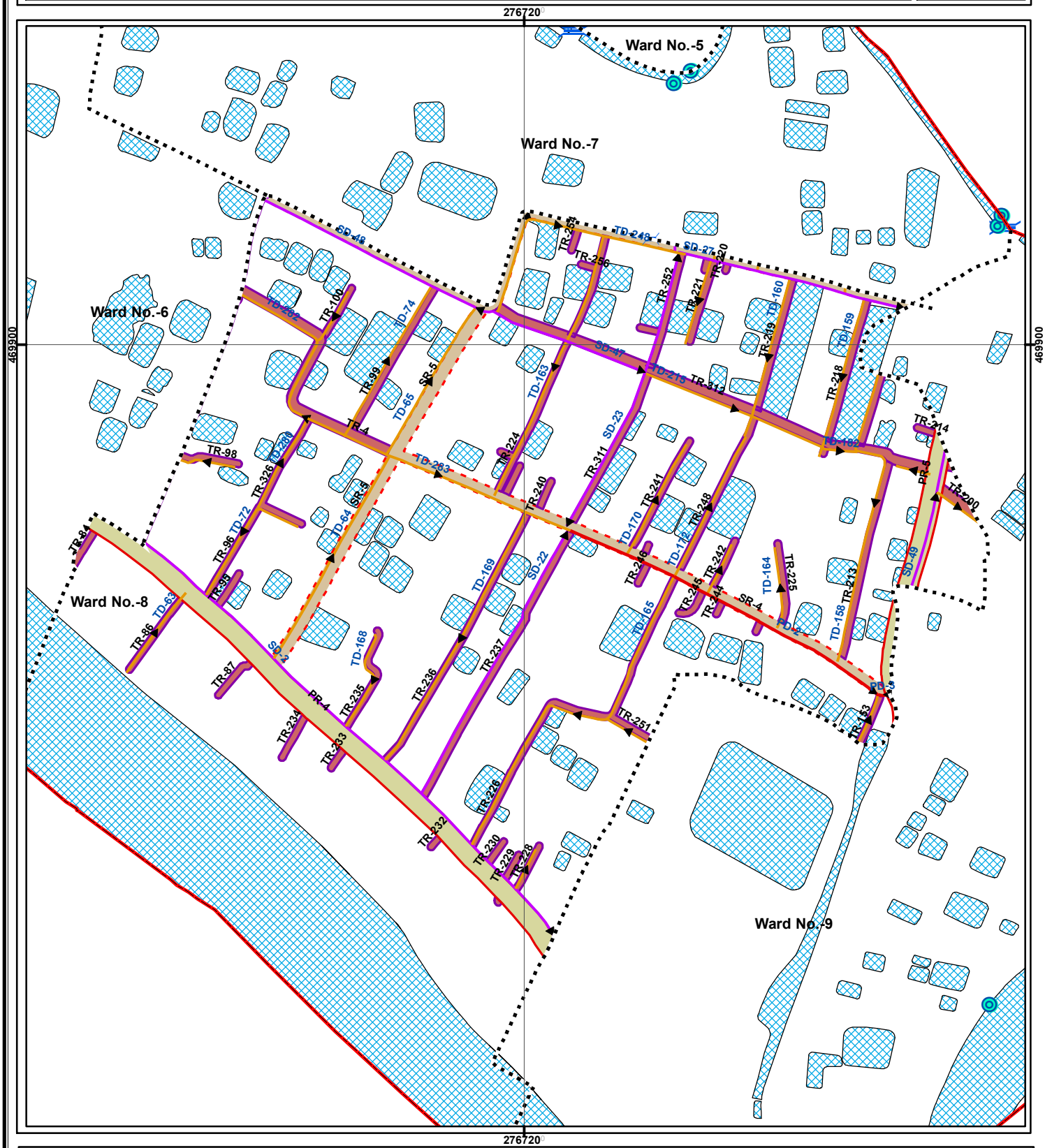
Drain ID	Type	Width	Depth	Length (M)	Phasing
PD-2	Primary Drain	3.5-4.5	2.25-3.00	303.46	1st Phase
PD-3	Primary Drain	3.5-4.5	2.25-3.00	11.75	1st Phase
SD-2	Secondary Drain	2.5-3.5	1.25-2.25	495.34	1st Phase
SD-22	Secondary Drain	2.5-3.5	1.25-2.25	261.83	1st Phase
SD-23	Secondary Drain	2.5-3.5	1.25-2.25	188.52	1st Phase
SD-24	Secondary Drain	2.5-3.5	1.25-2.25	71.59	1st Phase
SD-25	Secondary Drain	2.5-3.5	1.25-2.25	6.65	1st Phase
SD-27	Secondary Drain	2.5-3.5	1.25-2.25	203.15	1st Phase
SD-46	Secondary Drain	2.5-3.5	1.25-2.25	2.77	2nd Phase
SD-46	Secondary Drain	2.5-3.5	1.25-2.25	0.07	2nd Phase
SD-47	Secondary Drain	2.5-3.5	1.25-2.25	143.31	2nd Phase
SD-48	Secondary Drain	2.5-3.5	1.25-2.25	222.88	2nd Phase
SD-49	Secondary Drain	2.5-3.5	1.25-2.25	123.72	2nd Phase
TD-121	Tertiary Drain	2-2.5	.64-1.25	45.54	2nd Phase
TD-157	Tertiary Drain	2-2.5	.64-1.25	2.44	3rd Phase
TD-158	Tertiary Drain	2-2.5	.64-1.25	282.86	3rd Phase
TD-159	Tertiary Drain	2-2.5	.64-1.25	142.88	3rd Phase
TD-160	Tertiary Drain	2-2.5	.64-1.25	143.04	3rd Phase
TD-161	Tertiary Drain	2-2.5	.64-1.25	76.76	3rd Phase
TD-162	Tertiary Drain	2-2.5	.64-1.25	6.00	3rd Phase
TD-163	Tertiary Drain	2-2.5	.64-1.25	246.10	3rd Phase
TD-164	Tertiary Drain	2-2.5	.64-1.25	72.04	3rd Phase
TD-165	Tertiary Drain	2-2.5	.64-1.25	328.23	3rd Phase
TD-167	Tertiary Drain	2-2.5	.64-1.25	38.62	3rd Phase
TD-168	Tertiary Drain	2-2.5	.64-1.25	92.80	3rd Phase
TD-169	Tertiary Drain	2-2.5	.64-1.25	248.38	3rd Phase
TD-170	Tertiary Drain	2-2.5	.64-1.25	109.23	3rd Phase
TD-171	Tertiary Drain	2-2.5	.64-1.25	48.23	3rd Phase
TD-172	Tertiary Drain	2-2.5	.64-1.25	136.58	3rd Phase
TD-173	Tertiary Drain	2-2.5	.64-1.25	6.20	3rd Phase
TD-175	Tertiary Drain	2-2.5	.64-1.25	41.38	3rd Phase

Drain ID	Type	Width	Depth	Length (M)	Phasing
TD-176	Tertiary Drain	2-2.5	.64-1.25	5.97	3rd Phase
TD-182	Tertiary Drain	2-2.5	.64-1.25	30.21	3rd Phase
TD-184	Tertiary Drain	2-2.5	.64-1.25	31.01	3rd Phase
TD-194	Tertiary Drain	2-2.5	.64-1.25	1.51	3rd Phase
TD-215	Tertiary Drain	2-2.5	.64-1.25	168.12	3rd Phase
TD-247	Tertiary Drain	2-2.5	.64-1.25	2.65	3rd Phase
TD-248	Tertiary Drain	2-2.5	.64-1.25	226.33	3rd Phase
TD-280	Tertiary Drain	2-2.5	.64-1.25	89.17	3rd Phase
TD-281	Tertiary Drain	2-2.5	.64-1.25	0.23	3rd Phase
TD-282	Tertiary Drain	2-2.5	.64-1.25	160.40	3rd Phase
TD-283	Tertiary Drain	2-2.5	.64-1.25	248.01	3rd Phase
TD-287	Tertiary Drain	2-2.5	.64-1.25	46.27	3rd Phase
TD-63	Tertiary Drain	2-2.5	.64-1.25	86.80	2nd Phase
TD-64	Tertiary Drain	2-2.5	.64-1.25	203.07	2nd Phase
TD-65	Tertiary Drain	2-2.5	.64-1.25	152.21	2nd Phase
TD-66	Tertiary Drain	2-2.5	.64-1.25	7.93	2nd Phase
TD-72	Tertiary Drain	2-2.5	.64-1.25	126.07	2nd Phase
TD-73	Tertiary Drain	2-2.5	.64-1.25	50.19	2nd Phase
TD-74	Tertiary Drain	2-2.5	.64-1.25	152.77	2nd Phase
TD-75	Tertiary Drain	2-2.5	.64-1.25	51.54	2nd Phase
			Total	**5942.81**	

Besides, it will be necessary to re-excavate the khals that serve as primary drains. The consultants have identified existing whole of the khals need to be re-excavated to allow smooth flow of water through them.

Map 14.23 represents proposed Road and Drainage Map of ward 8.

Map 14.23 : Road & Drainage Network for Ward no. 8



Legend

- Paurashava Boundary
- Ward Boundary Poly
- Mouza Boundary
- Proposed Outfall
- Bridge
- Culvert
- Proposed Bridge
- Primary Road
- Secondary Road
- Tertiary Road
- Walkway
- Primary Drain
- Secondary Drain
- Tertiary Drain
- Proposed Waterbody

0 35 70 140 210 280 Meters

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CONSULTANT

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14.10.2.5 Urban Services

a. Solid Waste Management

Solid waste management is an important urban service. As density of population increases the volume of solid waste also increases proportionately. This ward will be developed as an industrial area. However, the income level is also another major factor influencing the volume of solid waste. Population and the volume of waste in the town are yet to be large enough to become a problem for it. But the present management system is not satisfactory and it might be led to problem in future. The consultant proposes one solid waste transfer station in this ward at on an area of 0.33 acre. It is recommended that home collection system is introduced in the ward by creation of local CBOs. This will cause organized collection of waste and prevent indiscriminate littering.

b. Water Supply

It is proposed to install a network based water supply system by exploring fresh water from the Andharmanik River for the entire Paurashava. And water supply lines in this ward will be established along all categories of roads as per the growth of the settlement.

c. Sanitation

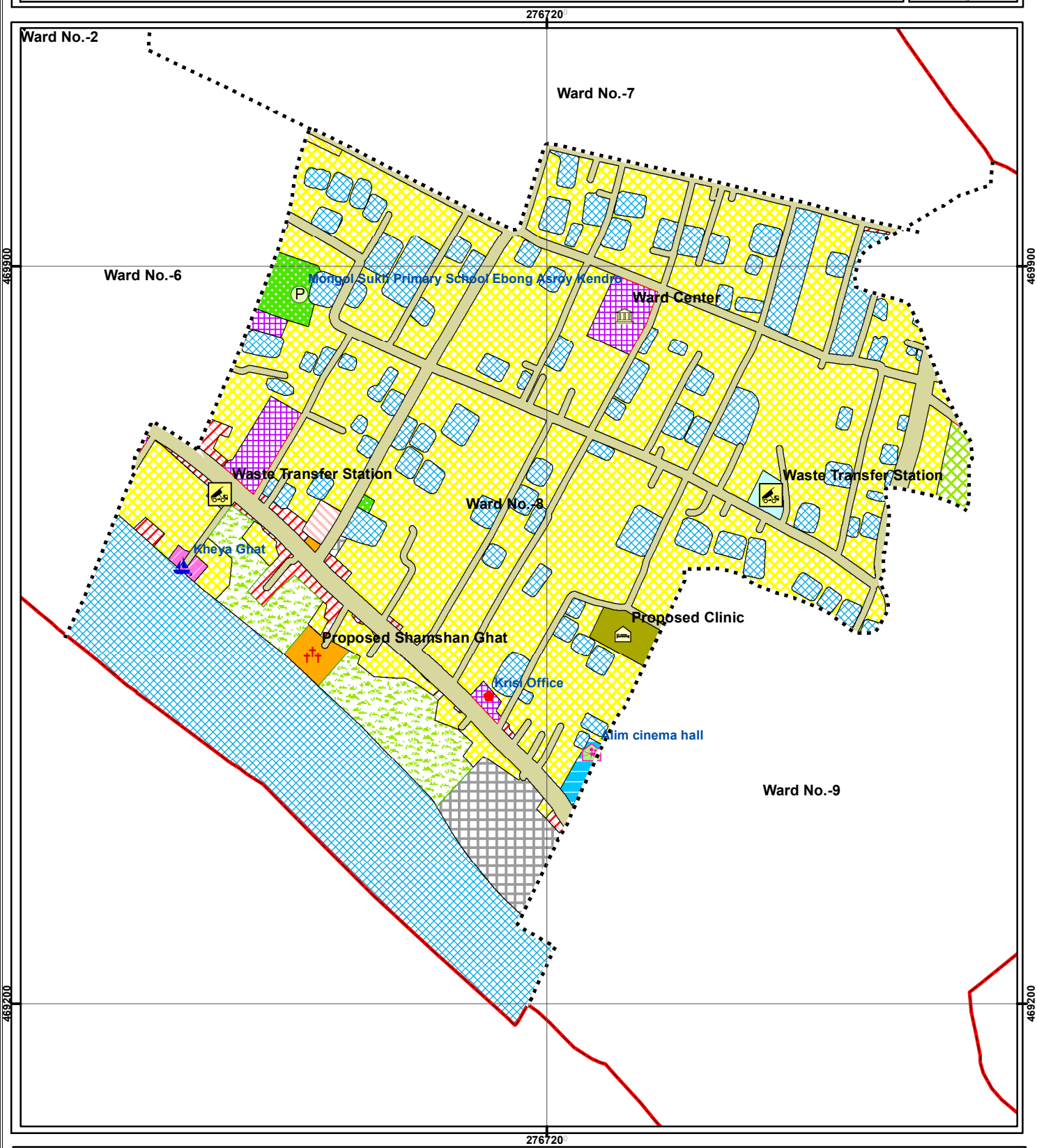
It is apprehended that the government would not be able to provide network and treatment based sanitation system for the town. So the present system of sanitation will continue. However, the Paurashava must try to promote hygienic sanitation to ensure better public health. There is hardly any public toilet in the town to serve the visitors and the local people. The existing toilet of bus terminal area has to be developed as public toilet is required for the town people and as well as for the passengers waiting for departure. **Map 14.24** represents proposed Urban service proposal for ward 8.

Table14.40: Development Proposals for ward 08

ID	Type of facility	Ward no	Mouza Name	Plot no	Area (Acre)
WC_08	Ward Center	8	Khepupara	1019,1022-23,1060	0.73
PC_81	Clinic	8	Khepupara	1032-33, 1035-36, 1041	1.03
PC_82	Clinic	8	Badurtali	682	
CR_08	Crematorium	8	Khepupara	937,9940-43,1106-07	0.427
WT_81	Waste Transfer Station	8	Khepupara	949	0.059
WT_86	Waste Transfer Station	8	Khepupara	1027-1028	0.240
				Total	**2.486**

Map 14.24 represents development proposals of ward 8

Map 14.24 : Development Proposal for Ward no. 8



Legend

- Paurashava Boundary
- Ward Boundary Poly
- Mouza Boundary
- College
- Panir Tanki
- Eidgah
- Ferry Ghat
- Fire Service
- Helipad
- Cinema Hall
- Ghat
- Government Office
- Primary School
- High School
- Hospital/Clinic
- Kheya Ghat
- Madrasa
- Market
- Monument
- Mosque
- Waste Transfer Station
- Dumping Site
- Electric Sub-Station
- Police Station
- Post Office
- Pourashava office
- Temple
- Upazilla Parishad
- Auditorium
- Clinic
- Cyclone Shelter
- Ward Center
- Low Income Housing
- Market
- Park
- Primary School
- Resettlement Zone
- Rickshaw/Tempo Stand
- Secondary School
- Shamshan Ghat
- Stadium
- Truck Terminal

0 35 70 140 210 280 Meters

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14.11 Ward Action Plan for Ward No. 09

14.11.1 Demography

Ward No. 9 is located on the south-eastern part of the town. It is one of the largest wards. It has least density of population. The estimated population for the year 2031 will be 5977 with a density of 26 persons per acre.

Table 14.41: Population Statistics of Ward No. 09

Item	Year			
	2016	2021	2026	2031
Area (acre)	229.87	229.87	229.87	229.87
Population	3979	4557	5219	5977
Density of Population (acre)	17	20	23	26

14.11.2 Ward Action Plan Proposals

14.11.2.1 Review of Existing Land Use

Ward no. 09 is mainly urban in character. Out of total about 229.87 acre of land of this ward almost 99.03 acre of land i.e. 43.08% of total land is under residential use. Water bodies occupy 28.94% land of the ward.

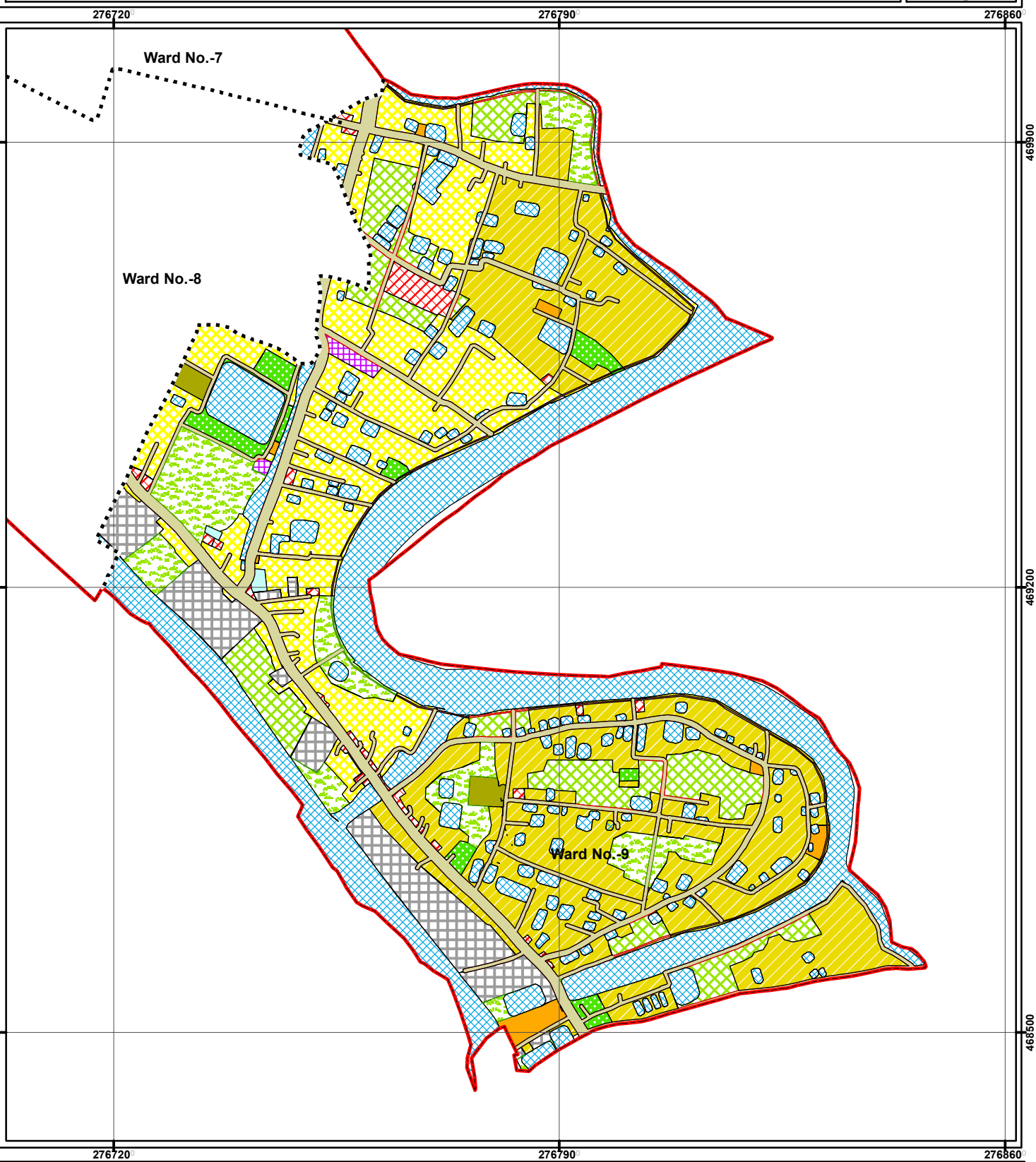
14.11.2.2 Proposed Land Use Zoning

The category wise proposals are presented here. Table 14.42 shows the amount of land existing and proposed uses in Ward no. 9. **Map 14.25** shows proposed land use of Ward 09.

Table 14.42: Comparative Scenario of Existing and Proposed Land Uses of Ward no. 09

Sl. No.	Landuse (Existing)	Area (Acre)	%	Sl. No.	Landuse (Proposed)	Area (Acre)	%
1	Administrative	0.14	0.06	1	Administrative	0.64	0.28
2	Agriculture	23.53	10.24	2	Agriculture	16.33	7.15
3	Circulation Network	6.70	2.92	3	Circulation Network	26.36	11.54
4	Commercial Activity	2.29	1.00	4	Commercial Activity	2.45	1.07
5	Community Facility	1.80	0.78	5	Community Facility	1.55	0.68
6	Education & Research	3.62	1.57	6	Education & Research	3.16	1.38
7	Industrial	12.91	5.62	7	Health Facility	0.36	0.16
8	Open Space	13.31	5.79	8	Industrial	12.23	5.35
9	Recreational Facility	0.01	0.00	9	Open Space	14.22	6.22
10	Residential	99.03	43.08	10	Recreational Facility	0.01	0.00
11	Waterbody	66.53	28.94	11	Residential	87.49	38.30
				12	Utility Service	0.25	0.11
				13	Waterbody	63.42	27.76
	Total	**229.87**	**100**		**Total**	**229.87**	**100**

Map 14.25 : Landuse Plan of Ward no. 9



Legend

- Paurashava Boundary
- Ward Boundary Poly
- Mouza Boundary

- Administrative
- Agriculture
- Circulation Network
- Commercial Activity
- Community Facility
- Education & Research
- Health Facility
- Industrial
- Mixed Use
- Open Space
- Recreational Facilities
- Rural Settlement
- Transportation Facilities
- Urban Deferred
- Urban Settlement
- Utility Facility
- Waterbody

0 15 30 60 90 120 Meters

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In Association with

a. Residential Zone

In land uses, both the urban residential and rural homestead has been considered as residential use as a whole. In Ward Action Plan, more than 87.49 acre of land has been earmarked for urban residential use which will occupy 38.30% of the total land.

b. Circulation network

For any type of development, circulation network is an important facility. To improve the efficiency of transport network of the ward, more roads are proposed which will consume almost 26.36 acres of land and more than 11.54% of the total area.

c. Administrative Area

0.28% land has been allocated for administrative purpose. Ward councilor's office and a police box have been proposed in this ward.

d. Commercial Activity

At present, commercial activity and density of population are moderate in this ward. Only 2.45 acres of land has been proposed for this purpose which will occupy only 1.07 % of total land. Additionally, other commercial functions are provided at mixed use zone, along with administrative and community facilities for this ward. A retail sale market and a super market have been proposed in this ward.

e. Education and Research

In Ward Action Plan, 1.38% of total land has been allocated for education.

f. Health Facilities

0.16% land has been allocated for health purpose. A health center has been proposed in this purpose.

g. Community Facilities

Land for community facilities will be 1.55 acre which is 0.68%. A community center has been proposed in this ward.

i. Open Space

Land for Open space will be 14.22 acre which includes open recreational facilities playground, Local Park and green belt.

h. Agricultural Area

The total area under this use has been estimated as about 16.33 acres of land covering 7.15% of the total land. Rural homestead will also perform some agricultural activities as farm, poultry or horticulture. This zone will serve as the hinterland for the town.

i. Water bodies

The plan suggests for preserving most of the water bodies for two purposes, first, to serve as source of water, second to serve as water retention area during monsoon. The ponds will be preserved as the water retention ponds. The proposed retention area covers 63.42 acres of land which covers almost 27.76% of the total ward area.

j. Utility Service

Proposed utility service is 0.25 acre.

14.11.2.3 Proposed Road Infrastructure Development

Total 15.47 km road development proposal have been proposed for Ward no. 09 of Kalapara Paurashava. Length of the tertiary road will be 12.93 km and width of these roads will be 20 ft to 30 ft. Total length of secondary road will be 0.77 km and width of these roads will be 40 ft and Total length of primary road will be 1.76 km and width of these roads will be 60 ft to 80 ft for this ward. Length of walkway will be 2.91 km and width of this walkway will be 6 ft in this ward. Detail scenario of road network development proposal was given in Table 14.43. **Map 14.26** represents proposed Road network for ward 9.

Table 14.43: Road Network Proposal at Ward no. 09

Proposed Road ID	Type	Remark	Existing Width (ft)	Proposed Width (ft)	Length in (m)	Phase
PR-2	Primary Road	Extended	10	80	48.24	1st Phase
PR-4	Primary Road	Extended	16	60	1146.64	1st Phase
PR-5	Primary Road	Extended	10	60	565.43	1st Phase
				Sub-Total	**1760.31**	
SR-5	Secondary Road	Extended	10	40	452.51	1st Phase
SR-9	Secondary Road	Extended	6	40	321.26	1st Phase
				Sub-Total	**773.77**	
TR-3	Tertiary Road	Extended	10	30	1155.64	3rd Phase
TR-153	Tertiary Road	Extended	10	20	685.65	3rd Phase
TR-154	Tertiary Road	Extended	8	20	547.84	3rd Phase
TR-155	Tertiary Road	Extended	6	20	176.32	3rd Phase
TR-156	Tertiary Road	Extended	6	20	104.80	3rd Phase
TR-157	Tertiary Road	Extended	6	20	96.35	3rd Phase
TR-158	Tertiary Road	Extended	6	20	105.36	3rd Phase
TR-159	Tertiary Road	Extended	6	20	65.82	3rd Phase
TR-160	Tertiary Road	Extended	8	20	357.96	3rd Phase
TR-161	Tertiary Road	Extended	6	20	26.68	3rd Phase
TR-162	Tertiary Road	Extended	6	20	21.53	3rd Phase
TR-163	Tertiary Road	Extended	8	20	464.50	3rd Phase
TR-164	Tertiary Road	Extended	6	20	48.08	3rd Phase
TR-165	Tertiary Road	Extended	6	20	74.48	3rd Phase
TR-166	Tertiary Road	Extended	6	20	71.20	3rd Phase
TR-167	Tertiary Road	Extended	8	20	41.49	3rd Phase
TR-168	Tertiary Road	Extended	6	20	29.83	3rd Phase
TR-169	Tertiary Road	Extended	6	20	36.14	3rd Phase
TR-170	Tertiary Road	Extended	6	20	250.26	3rd Phase
TR-171	Tertiary Road	Extended	6	20	74.80	3rd Phase
TR-172	Tertiary Road	Extended	8	20	18.74	3rd Phase
TR-173	Tertiary Road	Extended	6	20	36.15	3rd Phase
TR-174	Tertiary Road	Extended	6	20	23.88	3rd Phase
TR-175	Tertiary Road	Extended	6	20	25.32	3rd Phase
TR-176	Tertiary Road	Extended	6	20	23.19	3rd Phase
TR-177	Tertiary Road	Extended	6	20	40.13	3rd Phase
TR-178	Tertiary Road	Extended	8	20	157.88	3rd Phase
TR-179	Tertiary Road	Extended	6	20	54.51	3rd Phase
TR-180	Tertiary Road	Extended	6	20	17.44	3rd Phase
TR-181	Tertiary Road	Extended	6	20	14.71	3rd Phase
TR-182	Tertiary Road	Extended	6	20	19.10	3rd Phase
TR-183	Tertiary Road	Extended	6	20	33.19	3rd Phase
TR-184	Tertiary Road	Extended	6	20	56.57	3rd Phase
TR-185	Tertiary Road	Extended	6	20	87.56	3rd Phase
TR-186	Tertiary Road	Extended	6	20	33.47	3rd Phase
TR-187	Tertiary Road	Extended	8	20	142.63	3rd Phase
TR-188	Tertiary Road	Extended	4	20	15.15	3rd Phase
TR-189	Tertiary Road	Extended	6	20	153.26	3rd Phase
TR-190	Tertiary Road	Extended	6	20	99.26	3rd Phase
TR-191	Tertiary Road	Extended	6	20	31.76	3rd Phase

Proposed Road ID	Type	Remark	Existing Width (ft)	Proposed Width (ft)	Length in (m)	Phase
TR-192	Tertiary Road	Extended	8	20	176.78	3rd Phase
TR-193	Tertiary Road	Extended	6	20	24.26	3rd Phase
TR-194	Tertiary Road	Extended	6	20	348.13	3rd Phase
TR-195	Tertiary Road	Extended	6	20	29.76	3rd Phase
TR-196	Tertiary Road	Extended	8	20	44.40	3rd Phase
TR-197	Tertiary Road	Extended	6	20	197.74	3rd Phase
TR-198	Tertiary Road	Extended	6	20	15.60	3rd Phase
TR-199	Tertiary Road	Extended	4	20	139.42	3rd Phase
TR-200	Tertiary Road	Extended	6	20	366.61	3rd Phase
TR-201	Tertiary Road	Extended	6	20	200.64	3rd Phase
TR-202	Tertiary Road	Extended	4	20	64.15	3rd Phase
TR-203	Tertiary Road	Extended	6	20	18.17	3rd Phase
TR-204	Tertiary Road	Extended	6	20	65.49	3rd Phase
TR-205	Tertiary Road	Extended	6	20	136.81	3rd Phase
TR-206	Tertiary Road	Extended	4	20	11.44	3rd Phase
TR-207	Tertiary Road	Extended	4	20	14.33	3rd Phase
TR-208	Tertiary Road	Extended	6	20	11.25	3rd Phase
TR-209	Tertiary Road	Extended	4	20	51.39	3rd Phase
TR-210	Tertiary Road	Extended	4	20	34.78	3rd Phase
TR-211	Tertiary Road	Extended	6	20	75.13	3rd Phase
TR-212	Tertiary Road	Extended	6	20	0.71	3rd Phase
TR-213	Tertiary Road	Extended	6	20	57.41	3rd Phase
TR-214	Tertiary Road	Extended	6	20	1.28	3rd Phase
TR-215	Tertiary Road	Extended	4	20	15.15	3rd Phase
TR-216	Tertiary Road	Extended	4	20	10.04	3rd Phase
TR-217	Tertiary Road	Extended	4	20	11.14	3rd Phase
TR-227	Tertiary Road	Extended	6	20	72.31	3rd Phase
TR-251	Tertiary Road	Extended	6	20	54.16	3rd Phase
TR-266	Tertiary Road	Extended	6	20	443.33	3rd Phase
TR-270	Tertiary Road	Extended	6	20	5.24	3rd Phase
TR-282	Tertiary Road	Extended	6	20	28.78	3rd Phase
TR-283	Tertiary Road	Extended	8	20	49.29	3rd Phase
TR-290	Tertiary Road	New	0	20	135.83	3rd Phase
TR-291	Tertiary Road	New	0	20	161.46	3rd Phase
TR-292	Tertiary Road	Extended	8	20	53.59	3rd Phase
TR-293	Tertiary Road	New	0	20	244.29	3rd Phase
TR-294	Tertiary Road	New	0	20	532.33	3rd Phase
TR-299	Tertiary Road	New	0	20	161.85	3rd Phase
TR-302	Tertiary Road	New	0	20	80.81	3rd Phase
TR-322	Tertiary Road	New	0	20	308.58	3rd Phase
TR-323	Tertiary Road	New	0	20	52.35	3rd Phase
				Sub-Total	**12934.55**	
TR-332	Walkway	New	0	6	2909.71	3rd Phase
				Grand Total	**15468.65**	

- "SR" for Secondary Road and TR" for Tertiary Road and Walkway

14.11.2.4 Drainage Development Plan

There are both natural and manmade drainage facilities at ward no. 09 of Kalapara Paurashava. Existing drainage is mostly depending on natural drainage facilities; Andharmanik River which is passing very close to the Paurashava .The proposed drainage facilities will be developed based on this natural channel. Table 14.44 shows the detail.

Table 14.44: Drainage Development Plan Proposals for ward 09

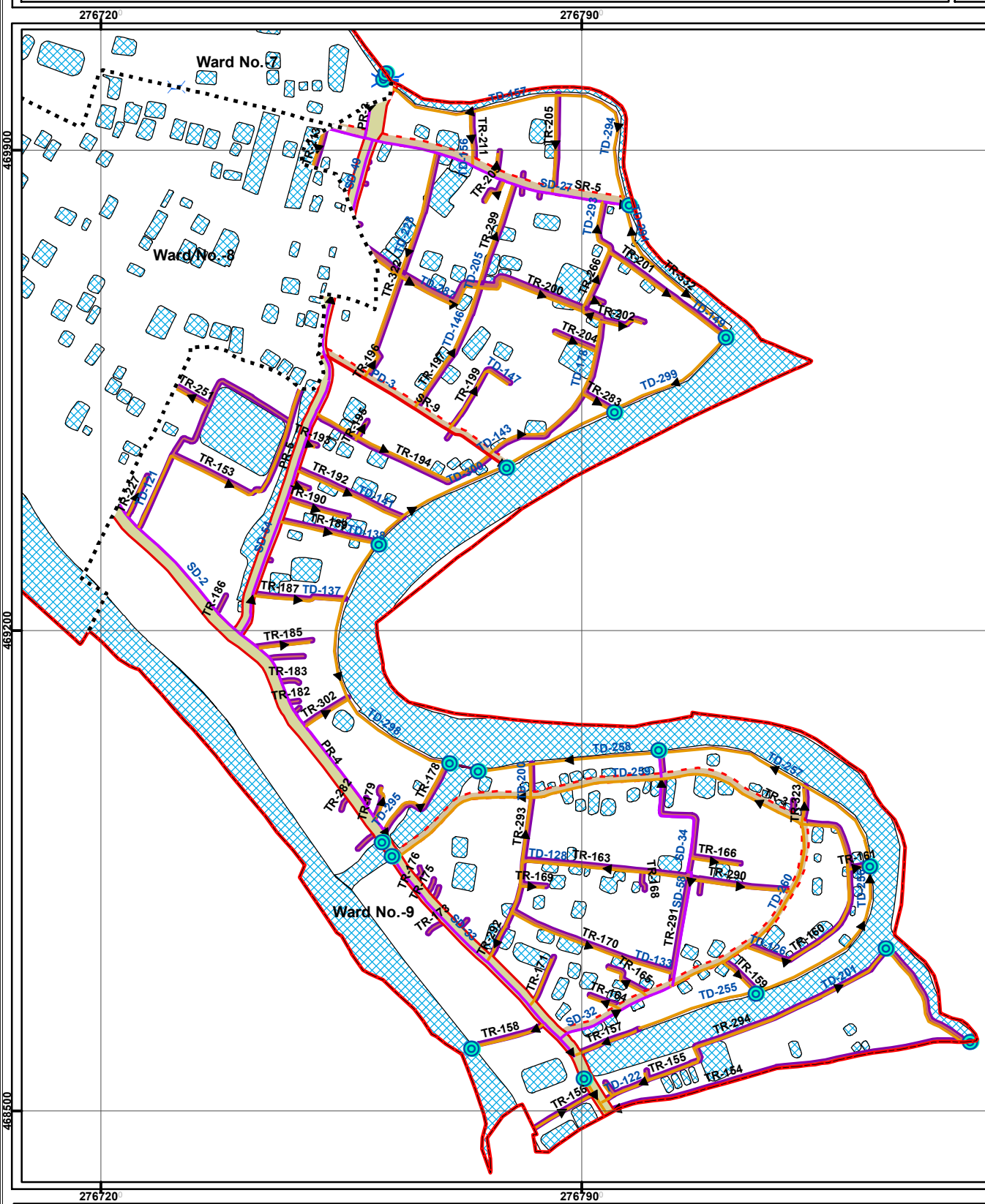
Drain ID	Type	Width	Depth	Length (M)	Phasing
PD-3	Primary Drain	3.5-4.5	2.25-3.00	320.72	1st Phase
SD-2	Secondary Drain	2.5-3.5	1.25-2.25	631.34	1st Phase
SD-27	Secondary Drain	2.5-3.5	1.25-2.25	453.23	1st Phase

Drain ID	Type	Width	Depth	Length (M)	Phasing
SD-32	Secondary Drain	2.5-3.5	1.25-2.25	180.63	1st Phase
SD-33	Secondary Drain	2.5-3.5	1.25-2.25	393.07	1st Phase
SD-34	Secondary Drain	2.5-3.5	1.25-2.25	234.55	1st Phase
SD-49	Secondary Drain	2.5-3.5	1.25-2.25	176.41	2nd Phase
SD-5	Secondary Drain	2.5-3.5	1.25-2.25	50.96	1st Phase
SD-54	Secondary Drain	2.5-3.5	1.25-2.25	456.38	2nd Phase
SD-58	Secondary Drain	2.5-3.5	1.25-2.25	161.40	2nd Phase
TD-121	Tertiary Drain	2-2.5	.64-1.25	422.81	2nd Phase
TD-122	Tertiary Drain	2-2.5	.64-1.25	176.32	2nd Phase
TD-123	Tertiary Drain	2-2.5	.64-1.25	103.21	2nd Phase
TD-124	Tertiary Drain	2-2.5	.64-1.25	96.35	2nd Phase
TD-125	Tertiary Drain	2-2.5	.64-1.25	65.82	2nd Phase
TD-126	Tertiary Drain	2-2.5	.64-1.25	357.96	2nd Phase
TD-127	Tertiary Drain	2-2.5	.64-1.25	26.68	2nd Phase
TD-128	Tertiary Drain	2-2.5	.64-1.25	246.15	2nd Phase
TD-129	Tertiary Drain	2-2.5	.64-1.25	51.86	2nd Phase
TD-130	Tertiary Drain	2-2.5	.64-1.25	77.72	2nd Phase
TD-131	Tertiary Drain	2-2.5	.64-1.25	71.20	2nd Phase
TD-132	Tertiary Drain	2-2.5	.64-1.25	36.14	2nd Phase
TD-133	Tertiary Drain	2-2.5	.64-1.25	250.26	2nd Phase
TD-134	Tertiary Drain	2-2.5	.64-1.25	187.12	2nd Phase
TD-135	Tertiary Drain	2-2.5	.64-1.25	54.51	2nd Phase
TD-136	Tertiary Drain	2-2.5	.64-1.25	75.47	2nd Phase
TD-137	Tertiary Drain	2-2.5	.64-1.25	135.75	2nd Phase
TD-138	Tertiary Drain	2-2.5	.64-1.25	149.68	2nd Phase
TD-139	Tertiary Drain	2-2.5	.64-1.25	92.74	2nd Phase
TD-140	Tertiary Drain	2-2.5	.64-1.25	25.04	2nd Phase
TD-141	Tertiary Drain	2-2.5	.64-1.25	170.04	2nd Phase
TD-142	Tertiary Drain	2-2.5	.64-1.25	17.42	2nd Phase
TD-143	Tertiary Drain	2-2.5	.64-1.25	342.35	2nd Phase
TD-144	Tertiary Drain	2-2.5	.64-1.25	29.76	2nd Phase
TD-145	Tertiary Drain	2-2.5	.64-1.25	47.43	2nd Phase
TD-146	Tertiary Drain	2-2.5	.64-1.25	201.55	2nd Phase
TD-147	Tertiary Drain	2-2.5	.64-1.25	140.27	2nd Phase
TD-148	Tertiary Drain	2-2.5	.64-1.25	128.16	2nd Phase
TD-149	Tertiary Drain	2-2.5	.64-1.25	211.46	2nd Phase
TD-150	Tertiary Drain	2-2.5	.64-1.25	64.15	2nd Phase
TD-151	Tertiary Drain	2-2.5	.64-1.25	18.17	3rd Phase
TD-152	Tertiary Drain	2-2.5	.64-1.25	65.49	3rd Phase
TD-153	Tertiary Drain	2-2.5	.64-1.25	142.80	3rd Phase
TD-154	Tertiary Drain	2-2.5	.64-1.25	49.11	3rd Phase
TD-155	Tertiary Drain	2-2.5	.64-1.25	35.31	3rd Phase
TD-156	Tertiary Drain	2-2.5	.64-1.25	77.71	3rd Phase
TD-157	Tertiary Drain	2-2.5	.64-1.25	257.97	3rd Phase
TD-158	Tertiary Drain	2-2.5	.64-1.25	54.57	3rd Phase
TD-166	Tertiary Drain	2-2.5	.64-1.25	61.20	3rd Phase
TD-175	Tertiary Drain	2-2.5	.64-1.25	52.80	3rd Phase
TD-178	Tertiary Drain	2-2.5	.64-1.25	227.58	3rd Phase
TD-193	Tertiary Drain	2-2.5	.64-1.25	54.85	3rd Phase
TD-198	Tertiary Drain	2-2.5	.64-1.25	146.21	3rd Phase
TD-199	Tertiary Drain	2-2.5	.64-1.25	53.59	3rd Phase
TD-200	Tertiary Drain	2-2.5	.64-1.25	244.29	3rd Phase
TD-201	Tertiary Drain	2-2.5	.64-1.25	531.51	3rd Phase
TD-205	Tertiary Drain	2-2.5	.64-1.25	159.45	3rd Phase
TD-208	Tertiary Drain	2-2.5	.64-1.25	73.58	3rd Phase
TD-228	Tertiary Drain	2-2.5	.64-1.25	304.17	3rd Phase
TD-229	Tertiary Drain	2-2.5	.64-1.25	52.35	3rd Phase
TD-253	Tertiary Drain	2-2.5	.64-1.25	0.06	3rd Phase
TD-254	Tertiary Drain	2-2.5	.64-1.25	0.67	3rd Phase
TD-255	Tertiary Drain	2-2.5	.64-1.25	378.93	3rd Phase
TD-256	Tertiary Drain	2-2.5	.64-1.25	116.35	3rd Phase

Drain ID	Type	Width	Depth	Length (M)	Phasing
TD-257	Tertiary Drain	2-2.5	.64-1.25	343.69	3rd Phase
TD-258	Tertiary Drain	2-2.5	.64-1.25	263.77	3rd Phase
TD-259	Tertiary Drain	2-2.5	.64-1.25	423.61	3rd Phase
TD-260	Tertiary Drain	2-2.5	.64-1.25	554.74	3rd Phase
TD-284	Tertiary Drain	2-2.5	.64-1.25	89.58	3rd Phase
TD-285	Tertiary Drain	2-2.5	.64-1.25	35.19	3rd Phase
TD-286	Tertiary Drain	2-2.5	.64-1.25	101.77	3rd Phase
TD-287	Tertiary Drain	2-2.5	.64-1.25	133.98	3rd Phase
TD-288	Tertiary Drain	2-2.5	.64-1.25	3.10	3rd Phase
TD-289	Tertiary Drain	2-2.5	.64-1.25	27.42	3rd Phase
TD-290	Tertiary Drain	2-2.5	.64-1.25	58.86	3rd Phase
TD-291	Tertiary Drain	2-2.5	.64-1.25	78.82	3rd Phase
TD-292	Tertiary Drain	2-2.5	.64-1.25	173.26	3rd Phase
TD-293	Tertiary Drain	2-2.5	.64-1.25	81.06	3rd Phase
TD-294	Tertiary Drain	2-2.5	.64-1.25	230.15	3rd Phase
TD-295	Tertiary Drain	2-2.5	.64-1.25	144.68	3rd Phase
TD-296	Tertiary Drain	2-2.5	.64-1.25	5.99	3rd Phase
TD-297	Tertiary Drain	2-2.5	.64-1.25	0.18	3rd Phase
TD-298	Tertiary Drain	2-2.5	.64-1.25	418.38	3rd Phase
TD-299	Tertiary Drain	2-2.5	.64-1.25	200.85	3rd Phase
TD-300	Tertiary Drain	2-2.5	.64-1.25	397.20	3rd Phase
			Total	**14039.07**	

Besides, it will be necessary to re-excavate the khals that serve as primary drains. The consultants have identified existing whole of the khals need to be re-excavated to allow smooth flow of water through them. **Map 14.26** represents proposed Road and Drainage network for ward 9.

Map 14.26 : Road & Drainage Network for Ward no. 9



Legend

- Paurashava Boundary
- Ward Boundary Poly
- Mouza Boundary
- Proposed Outfall
- Bridge
- Culvert
- Proposed Bridge
- Primary Road
- Secondary Road
- Tertiary Road
- Walkway
- Primary Drain
- Secondary Drain
- Tertiary Drain
- Proposed Waterbody

0 35 70 140 210 280 Meters

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

CONSULTANT

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14.11.2.5 Urban Services.

a. Solid Waste Management

Solid waste management is an important urban service. As density of population increases the volume of solid waste also increases proportionately. This ward will be developed as an industrial area. However, the income level is also another major factor influencing the volume of solid waste. Population and the volume of waste in the town are yet to be large enough to become a problem for it. But the present management system is not satisfactory and it might be led to problem in future. The consultant proposes one solid waste transfer station in this ward at on an area of 0.19 acre. It is recommended that home collection system is introduced in the ward by creation of local CBOs. This will cause organized collection of waste and prevent indiscriminate littering.

b. Water Supply

It is proposed to install a network based water supply system by exploring fresh water from the Andharmanik River for the entire Paurashava. And water supply lines in this ward will be established along all categories of roads as per the growth of the settlement.

c. Sanitation

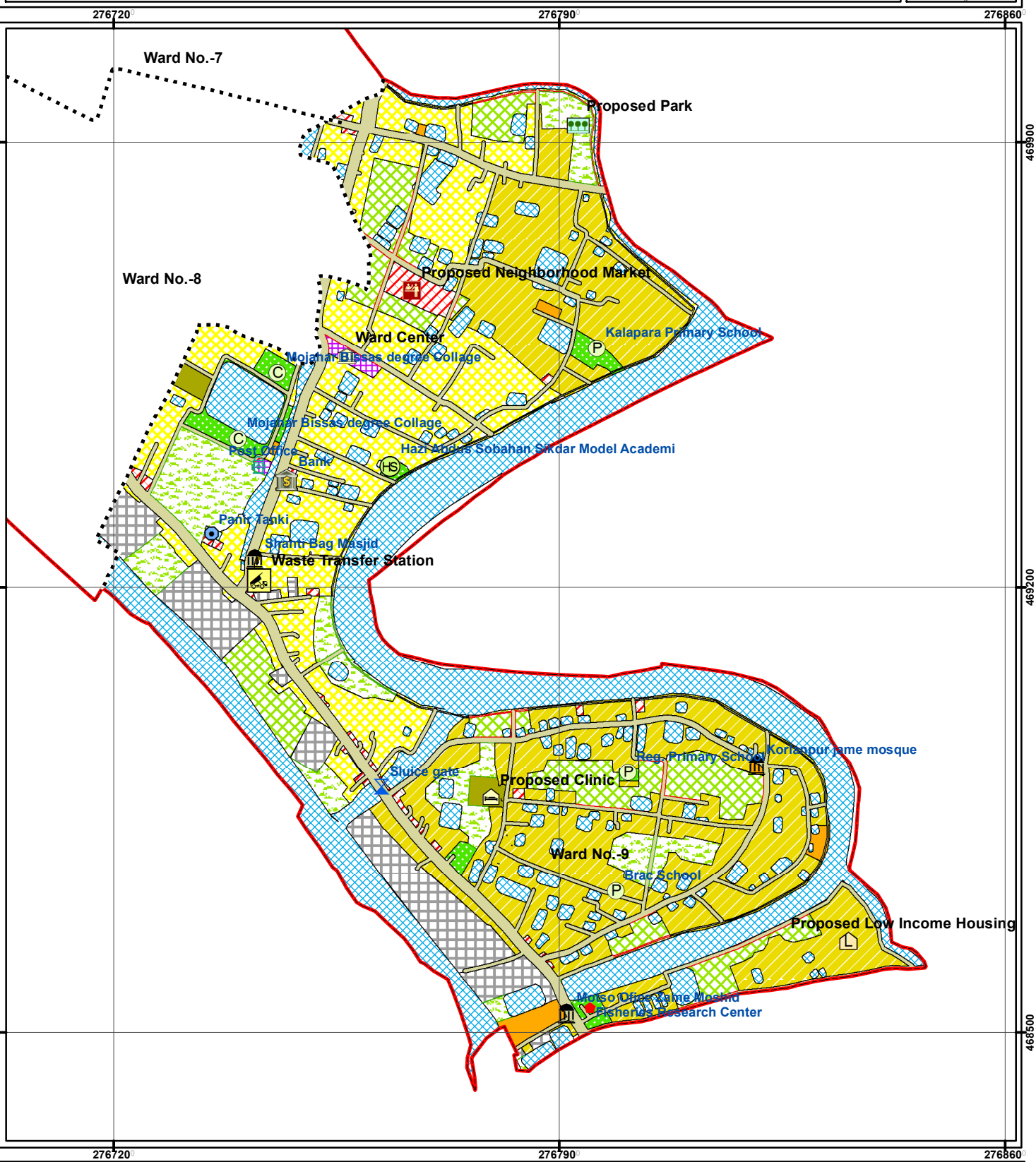
It is apprehended that the government would not be able to provide network and treatment based sanitation system for the town. So the present system of sanitation will continue. However, the Paurashava must try to promote hygienic sanitation to ensure better public health. There is hardly any public toilet in the town to serve the visitors and the local people. The existing toilet of bus terminal area has to be developed as public toilet is required for the town people and as well as for the passengers waiting for departure. **Map 14.27** represents proposed Urban service proposal for ward 9.

Table14.45: Development Proposals for ward 09

ID	Type of facility	Ward no	Mouza Name	Plot no	Area (Acre)
LI_09	Low Income Housing	9	Badurtali	816,913-16,985-86	2.50
NM_09	Neighborhood Market	9	Badurtali	617, 641-42, 644	1.18
WC_09	Ward Center	9	Badurtali	652	0.54
PP_09	Park	9	Badurtali	608,613-14	1.73
PC_09	Clinic	9	Badurtali	721-723	0.61
GY_09	Graveyard	9	Badurtali	816,925,990	0.911
WT_09	Waste Transfer Station	9	Badurtali	671-72	0.174
				Total	**7.645**

Map 14.27 represents development proposals for ward 9.

Map 14.27 : Development Proposal for Ward no. 9



Legend

- Paurashava Boundary
- Ward Boundary Poly
- Mouza Boundary
- College
- Panir Tanki
- Eidgah
- Ferry Ghat
- Fire Service
- Helipad
- Cinema Hall
- Ghat
- Government Office
- Primary School
- High School
- Hospital/Clinic
- Kheya Ghat
- Madrasa
- Market
- Monument
- Mosque
- Waste Transfer Station
- Dumping Site
- Electric Sub-Station
- Police Station
- Post Office
- Pourashava office
- Temple
- Upazilla Parishad
- Auditorium
- Clinic
- Cyclone Shelter
- Ward Center
- Low Income Housing
- Market
- Park
- Primary School
- Resettlement Zone
- Rickshaw/Tempo Stand
- Secondary School
- Shamshan Ghat
- Stadium
- Truck Terminal

0 35 70 140 210 280 Meters

Local Government Engineering Department (LGED)
Government of the People's Republic of Bangladesh
Ministry of Local Government,
Rural Development and Cooperatives

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14.12 Implementation Guidelines

The Master Plan of Kalapara Paurashava will be an effective tool for planned urban development, if it is implemented properly with legal enforcement. The different components of the Master Plan have varied implications if they are not implemented in an integrated manner. There is no separate laws related directly to the implementation of Master Plan of the Paurashavas in the country other than the Paurashava Ordinance/Act 2009 and some relevant national policies and laws as discussed in chapter 5 under the Structure Plan.

However, the legal provisions that have been made in the Paurashava Ordinance/Act 2009 can effectively be applied in the implementation of the Master Plan of Kalapara Pouashava for the time being along with other relevant national policies and laws that have also implications at Paurashava level, such as Wetland Conservation Act 2000 and BNBC 1993. Other national policies, guidelines and laws relevant to population, agriculture, environment, tourism, building materials, building construction etc. have implications for the implementation of various components including the Ward Action Plan of the Master Plan of Kalapara Paurashava.

Therefore, until specific laws and guidelines are made by the government for the Paurashavas in Bangladesh for the implementation of Master Plans, the existing laws, policies and guidelines should be strictly followed so that the goal and objectives of these plans are achieved. Effective application of the various existing policies and laws require prudent exercise of professional knowledge and expertise, which is lacking in the existing human resources of the Paurashavas in Bangladesh. In particular, the Paurashavas require professional urban/town planner(s) in the set up of their manpower. In this context, there is an urgent need for the creation of a planning division/section in the existing set up of the Paurashava Organogram.

14.12.1 Proposals for Mitigation of Identified Issues

The critical issues of planning and development identified in the Structure Plan have been addressed through the preparation of Urban Area Plan and Ward Action Plan. The proposals made in these plans resolve the issues addressed in the Structure Plan.

14.12.2 Comparative Advantage of Master Plan

The Paurashavas in Bangladesh do not have any practicing plans at present in regard to organized development of land use or infrastructure. This situation has been continuing over a long period of time in the past promoting spontaneous land and infrastructure development. As a result, there are examples of unplanned development creating discomfort to the people living in almost all Paurashavas in the country. The implementation of the currently prepared Master Plan of the Paurashava will remove those obstacles by applying the principles, guidelines and proposals of various components of its Master Plan. The Ward Action Plan prepared following the Urban Area Plan will solve the most pressing needs of the town in infrastructure development.

14.13 Conclusion

The Paurashavas in Bangladesh for the first time in its history are having their detailed Master Plans prepared scientifically using modern tools and techniques. These Master Plans will be effective tools for planned development of most of the urban centers in Bangladesh. The planned township development will also ensure required services for the rural areas of the country. This in turn will make a positive impact on economic growth, social progress and environmental sustainability. Kalapara Paurashava must avail this opportunity for its progress in the future by implementing its newly prepared Master Plan.

Annexure

Team Composition of Master Plan Preparation

A.1 Personnel of the Project Management Office (UTIDP, LGED)

Sl No.	Name	Position
1	Md. Moslah Uddin	Project Director
2	Md. Manzurul Islam	Deputy Project Director
3	Syed Shahriar Amin	Urban Planner
4	Pulin Chandra Golder	Urban Planner
5	Ziaul Huq	Urban Planner
6	Md. Saifur Rahman	Junior Urban Planner
7	Md. Rakibul Hossain	Junior Urban Planner
8	Md. Saifur Rahman	Junior Urban Planner
9	Md. Rakibul Hossain	Junior Urban Planner

A.2 Personnel of the Consultancy Firm Sheltech Consultants (Pvt.) Ltd.

A. Key Personnel:

Sl No.	Name	Position
1	Sultana Dilruba Aziz	Team Leader
2	Afsana M Kamal	Deputy Team Leader
3	Rukhsana Parveen	Urban Planner
4	Dr. Md. Altaf Hossain	Urban Planner
5	A.K.M. Mahfuzul Kabir	Demographer/Statistician
6	Dr. Santi Ranjan Hawlader	Urban Development Economist
7	Lipika Khan	Transport Planning Expert
8	Mohammed Iqbal Hossain	Municipal Engineer
9	Mohammad Ferozuddin	Architect Planner
10	Mohammad Quadiruzzaman	Environmental Analyst
11	Tripal Kumar Sen	GIS Specialist
12	Md. Hefzul Bari	Legal Expert

B. Supporting Stuff:

Sl No.	Name	Position
1	Mohammad Helal	Office Manager
2	M.A. Quayum	Computer Operator
3	Md. Jahangir Hossain	Computer Operator
4	Raihanul Islam	CAD Operator
5	Zakaria Ahmed	CAD Operator
6	ANM Shafiqul Alam	Surveyor
7	Aolad Hossain	Surveyor

রেজিষ্টার্ড নং ডি এ-১

Kalapara

বাংলাদেশ গেজেট

অতিরিক্ত সংখ্যা

কর্তৃপক্ষ কর্তৃক প্রকাশিত

মঙ্গলবার, ফেব্রুয়ারী ২৫, ১৯৯৭

গণপ্রজাতন্ত্রী বাংলাদেশ সরকার

স্থানীয় সরকার, পল্লী উন্নয়ন ও সমবায় মন্ত্রণালয়

স্থানীয় সরকার বিভাগ

(পৌর-৩ শাখা)

প্রজ্ঞাপন

তারিখ, ১৩ই ফাল্গুন ১৪০৩/২৫শে ফেব্রুয়ারী ১৯৯৭

এস, আর, ও নং ৫৩-আইন/৯৭—যেহেতু সরকার নিম্ন তফসিলে উল্লিখিত শহর এলাকা-সমূহকে মিউনিসিপ্যালিটি ঘোষণা করার প্রস্তাব করিয়াছিল;

এবং যেহেতু সরকার Declaration and Alteration of Municipalities Rules, 1978 অতঃপর উক্ত Rules বলিয়া উল্লিখিত, এর rule 3 এর অধীন পাবলিক নোটিশ জারী করার জন্য সংশ্লিষ্ট ডেপুটি কমিশনারকে নির্দেশ প্রদান করিয়াছিল;

এবং যেহেতু সরকার প্রস্তাবিত মিউনিসিপ্যালিটির ব্যাপারে ডেপুটি কমিশনারের প্রতিবেদন বিবেচনা করিয়া উক্ত Rules এর rule 4(2) এর অধীন নিম্ন তফসিলভুক্ত শহর এলাকাসমূহকে মিউনিসিপ্যালিটি ঘোষণার জন্য চূড়ান্ত সিদ্ধান্ত গ্রহণ করিয়াছে;

মূল্য : টাকা ১.০০

অতএব, যেহেতু উক্ত Rules এর rule 5 এর বিধান মোতাবেক সরকার এতদ্বারা নিম্ন তফসিলভুক্ত শহর এলাকাসমূহ সমন্বয়ে আগামী ১৭ই ফাল্গুন ১৪০৩ বাংলা মোতাবেক ১লা মার্চ ১৯৯৭ ইং হইতে কলাপাড়া মিউনিসিপ্যালিটি গঠনের ঘোষণা করিল।

তফসিল

ক্রমঃ নং	ইউনিয়নের নাম	মৌজার নাম	জে, এল, নং	দাগ নং
১	২	৩	৪	৫
(১)	টিয়াখালী	খেপুপাড়া সিট নং-১	৬	১৩৩—১৪০, ১৪৩—১৯২, ২০৫—২১১, ২৩৫—২৫৩, ২৬৭—২৭১, ২৭৭—২৮১।
(২)	ঐ	খেপুপাড়া সিট নং-২	৬	৩২৯, ৩৩১, ৩৩২, ৩৩৪—৩৫৫, ৩৫৭—৪০৪, ৪০৬—৪১৫, ৪১৮—৪৩২, ৪৪০—৪৯০, ৪৯৭, ৪৯৯—৫২০, ৫৫২।
(৩)	ঐ	খেপুপাড়া সিট নং-৩	৬	৬০১—৮৫২, ৮৬৫—১১৩৯।
(৪)	ঐ	খাপড়াভাঙ্গা সিট নং-১	৭	৬০১—৬১৪, ৬১৬—৬২৬, ৬৭৯, ৬৮৫, ৬৮৬, ৬৯৬, ৬৯৮।

রাষ্ট্রপতির আদেশক্রমে
মোঃ নুর হোসেন মোল্লা
উপ-সচিব (পৌর)।

মুহাম্মদ রবিউল ইসলাম, উপ-নিয়ন্ত্রক, বাংলাদেশ সরকারী মুদ্রণালয়, ঢাকা কর্তৃক মুদ্রিত
মোঃ আনোয়ার হোসেন, উপ-নিয়ন্ত্রক, বাংলাদেশ ফরমস ও প্রকাশনী অফিস, তেজগাঁও, ঢাকা কর্তৃক প্রকাশিত।

Annexure- C: Land use Permission

a. Urban Residential Land Use

Land Use Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table A.1: Land Use Permitted

Permitted Urban Residential Uses
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
Public Transport Facility
Satellite Dish Antenna
Shelter (Passers By)
Shoe Repair or Shoeshine Shop (Small)
CBO Office
Special Dwelling
Temporary Tent
Temporary tent 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

Source: Compiled by the Consultants

*Permission of Neighborhood Center Facilities in absence of formal neighborhood should be subject to Landuse Permit Committee

Land Use 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 A.2: Land Use Conditionally Permitted

Conditionally Permitted Urban Residential Uses
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
Photofinishing Laboratory
Post Office
Postal Facilities
Sports and Recreation Club
Tennis Club

Conditionally Permitted Urban Residential Uses
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.

b. General Industry

Land use Permitted

General Industry land use category approve only Green and Orange-A category industry mentioned in *The Environmental Conservation Rule, 1997*.The following uses in the tables are proposed to be applicable for this zone only.

Table A.3: Land Use Permitted

Permitted General Industrial Activities
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
Salvage Yards
Satellite Dish Antenna
Sawmill, Chipping and Pallet Mill

Permitted General Industrial Activities
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

Land Use 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 A.4: Land Use Conditionally Permitted

Conditionally Permitted General Industrial Land Uses
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
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 other uses; except the permitted and conditionally permitted uses.

c. Commercial Zone

Land Use Permitted

Commercial zone is mainly intended for supporting the office and business works. There are several functions that are permitted in this zone.

Table A.5: Land Use Permitted

Permitted Commercial Activity
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
Beauty and Body Service
Bicycle Shop
Billiard Parlor \ Pool Hall
Book or Stationery Store or Newsstand
Building Material Sales or Storage (Indoors)

Permitted Commercial Activity
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
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

Land Use Conditionally Permitted

Some functions are permitted with some condition in this zone.

Table A.6: Land Use Conditionally Permitted

Conditionally permitted commercial activities
Amusement and Recreation (Indoors)
Bicycle Assembly, Parts and Accessories
Broadcast Studio \ Recording Studio (No Audience)

Conditionally permitted commercial activities
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
Retail Shops Ancillary To Studio \ Workshop
Stone \ Cut Stone Products Sales

Source: Compiled by the Consultants

Restricted Uses

All other uses except;, the permitted and conditionally permitted uses.

d. Rural Settlement

Land Use Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table A.7: Land Use Permitted

Permitted Rural Settlement
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
Plantation (Except Narcotic Plant)
Social Forestry
Memorial Structure

Source: Compiled by the Consultants

Land Use 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: Land Use Conditionally Permitted

Conditionally permitted uses under Rural Settlement
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.

e. Mixed use zone

Land Use Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table A.11: Land Use Permitted

Permitted uses in Mixed Use Zone
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
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
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

Permitted uses in Mixed Use Zone
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

Land Use Conditionally Permitted

The following uses may be permitted or disallowed in this zone after review and approval by the authority/committee.

Table A.12: Land Use Conditionally Permitted

Conditionally permitted uses in Mixed Use Zone
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
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

Conditionally permitted uses in Mixed Use Zone
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
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.

f. Education and Research Area

Land Use Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table A.13: Land Use Permitted

Permitted uses under Education & Research Zone
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
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
Permitted uses under Education & Research Zone
Social Forestry
Dormitory
Veterinary School \ College and Hospital

Source: Compiled by the Consultants

Land Use Conditionally Permitted

The following uses may be permitted or denied in this zone after review and approval by the authority/committee.

Table A.14: Land Use Conditionally Permitted

Conditionally permitted uses under Education and Research Zone
Auditorium, Coliseum, Meeting Halls, and Conference Facilities, Convention
Bank & Financial Institution
Barber Shop
Boarding and Rooming House
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.

g. Government Office

Land Use Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table A.15: Land Use Permitted

Permitted uses under Government Office Zone
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
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

Land Use Conditionally Permitted

The following uses may be permitted or denied in this zone after review and approval by the authority/committee.

Table A.16: Land Use Conditionally Permitted

Conditionally permitted uses under Government office
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
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.

h. Agricultural Zone

Land Use Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table A17: Land Use Permitted

Permitted uses under Agricultural Zone
Food Grain Cultivation
Vegetable Cultivation
Cash Crop Cultivation
Horticulture
Arboriculture
Dairy Firming

Permitted uses under Agricultural Zone
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)
Aquaculture
Static Transformer Stations
Transmission Lines
Utility Lines
Woodlot
Social Forestry

Source: Compiled by the Consultants

Land Use Conditionally Permitted

Table A18: Land Use Conditionally Permitted

Conditionally permitted uses under Agricultural Zone
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.

j. Open Space

Land Use Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table A.19: Land Use Permitted

Permitted uses under Open Space
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
Utility Lines
Woodlot
Zoo
Roadside Parking
Social Forestry
Memorial Structure

Source: Compiled by the Consultants

Landuse Conditionally Permitted

Table A 20: Land Use Conditionally Permitted

Conditionally permitted uses under open space
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.

k. Water Body

Retaining water is the main purpose of this type of Landuse.

Land Use Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table A.21: Land Use Permitted

Permitted uses under Water Body
Aquatic Recreation Facility (Without Structure)
Fishing Club
Utility Lines
Water Parks
Memorial Structure

Source: Compiled by the Consultants

Land Use Conditionally Permitted

The following uses may be permitted or denied in this zone after review and approval by the authority/committee.

Table A.22: Land Use Conditionally Permitted

Conditionally permitted uses under water body
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.

কলাপাড়া পৌরসভার খসড়া মহাপরিকল্পণার উপর মতবিনিময় সভার কার্যবিবরণী

তারিখ: ২৬/০২/২০১৪
স্থান: কলাপাড়া পৌরসভা
সময়: সকাল ১১:০০ ঘটিকায়

স্থানীয় সরকার প্রকৌশল অধিদপ্তর, কলাপাড়া পৌরসভা ও শেলটেক কনসালটেন্টস (প্রা:) লিমিটেড (পরামর্শক প্রতিষ্ঠান) এর যৌথ উদ্যোগে কলাপাড়া পৌরসভার খসড়া মহাপরিকল্পণার উপর মাননীয় মেয়র জনাব এস এম রাকিবুল আহসান এর সভাপতিত্বে বিগত ২৬ ফেব্রুয়ারী ২০১৪ ইং তারিখে এক মতবিনিময় সভা অনুষ্ঠিত হয়। উক্ত মতবিনিময় সভায় পৌরসভার কাউন্সিলরবৃন্দসহ স্থানীয় গণ্যমাণ্য ব্যক্তি-বর্গ, বিভিন্ন সরকারি-বেসরকারি অধিদপ্তরের কর্মকর্তাবৃন্দ, স্থানীয় সরকার প্রকৌশল অধিদপ্তরের প্রতিনিধি এবং মহাপরিকল্পণা প্রণয়ণ প্রকল্পে নিযুক্ত পরামর্শকবৃন্দ উপস্থিত ছিলেন।

সভার শুরুতে মাননীয় মেয়র মহোদয় জনাব এস এম রাকিবুল আহসান উপস্থিত সকলকে শুভেচ্ছা জানিয়ে আনুষ্ঠানিকভাবে সভার কার্যক্রম শুরু করেন। পৌরসভার মহাপরিকল্পণা প্রণয়ণ সংক্রান্ত কাজের উপর স্বাগত বক্তব্যে তিনি উল্লেখ করেন যে, পরিকল্পিতভাবে শহর গড়ে উঠলে একদিকে যেমন বাসযোগ্য উন্নত শহর গড়ে তোলা যাবে অন্যদিকে দেশের অর্থনীতি সমৃদ্ধ করা সম্ভব হবে। তিনি আরও উল্লেখ করেন যে আগামী (২০) বিশ বছরের উন্নয়ন দলিল এই মহাপরিকল্পণা। উক্ত পরিকল্পণায় উপস্থিত সকলকে সুচিন্তিত মতামত প্রদানের জন্য আহ্বান করেন যাতে করে পরিকল্পণাটি আরও গঠণমূলক, বাস্তবসম্মত ও যুগোপযোগী হয়।

উপজেলা শহর অবকাঠামো উন্নয়ন প্রকল্পের পরিকল্পণাবিদ সৈয়দ শাহরিয়ার আমিন মহাপরিকল্পণার স্বয়ংসম্পূর্ণ ও যথাযথ বাস্তবায়নের জন্য সকলের সহযোগীতা কামনা করেন এবং তিনি বলেন যে সকলের মূল্যবান মতামত পরিকল্পণাকে আরো গঠণমূলক ও সময়োপযোগী করে তুলবে। তিনি উল্লেখ করেন, যে মহাপরিকল্পণা প্রনয়ণ করা হচ্ছে ভবিষ্যতে তা যথাযথভাবে কার্যকর হলে কলাপাড়া পৌরসভা একটি পরিকল্পিত বাসযোগ্য শহর হিসেবে আত্মপ্রকাশ করবে।

পরামর্শক প্রতিষ্ঠানের পক্ষ থেকে প্রফেসর ডঃ নুরুল ইসলাম নাজেম, উপস্থিত সকলকে স্বাগত জানিয়ে খসড়া মহাপরিকল্পণার উপর Power Point Presentation এর মাধ্যমে তার বক্তব্য তুলে ধরেন। তিনি কার্যক্রমসমূহ, উন্নয়নের সম্ভাবনাসমূহ ধাপে ধাপে বর্ণনা করেন। এরপর মহাপরিকল্পণার কোথায় কিভাবে প্রস্তাবনা সমূহ ওয়ার্ড ভিত্তিক দেওয়া হয়েছে সেসব বিষদ আলোচনা করেন। তিনি আরও উল্লেখ করেন যে, সকলের মতামতের ভিত্তিতে যে প্রস্তাবসমূহ দেওয়া হয়েছিল তা নিম্নরূপ:

Proposed Facility	Ward No.	Mouza Name	Plot No.	Area (acre)
Low Income Housing	9	Badurtali	816,913-16,985-86	2.50
Resettlement Zone	5	Khepupara	499,500-12,514	7.64
Shopping Complex	2	Khepupara	612,632-37,653,655	0.43
Wholesale Market	3	Khepupara	402-04	0.753
Neighborhood Market	1	Khepupara	191-92,213,292	0.96
	9	Badurtali	617,641-42,644	1.18
Industrial Zone	1	Khepupara	208,213,217	5.59
Police Station	2	Khepupara	644-46	0.318
Ward Center	1	Khepupara	179	0.971
	2	Khepupara	636-37,401	0.513
	3	Khepupara	638	0.754
	4	Khepupara	844-46	0.713
	5	Khepupara	460,514	1.35

Proposed Facility	Ward No.	Mouza Name	Plot No.	Area (acre)
	6	Khepupara	958-60,986	0.42
	7	Khepupara	961	0.737
	8	Khepupara	1019,1022-23,1060	0.725
	9	Badurtali	652	0.539
College cum Cyclone Shelter	9	Badurtali	674,676,682	1.119
Primary School cum Cyclone Shelter	1	Khepupara	185, 190-191, 292	1.02
	5	Khepupara	460, 514-516	0.76
Secondary School cum Cyclone Shelter	1	Khepupara	165-168, 304	1.15
Children's Park	2	Khepupara	612,644,646	0.97
Stadium	1	Khepupara	179,182,185	4.14
Park	1	Khepupara	154-56,276	2.21
	3	Khepupara	352-53	2.38
	5	Khepupara	461,475-82, 503-04	1.09
	7	Khepupara	1012	1.15
	9	Badurtali	608,613-14	1.73
Auditorium	2	khepupara	612,641-42,644	0.756
Eidgah	2	Khepupara	654-55,658-59	0.601
Graveyard	4	Khepupara	849-52,865-67,888	3.486
	9	Badurtali	816,925,990	0.911
Crematorium	8	Khepupara	937,9940-43,1106-07	0.427
Shaheed Minar	4	Khepupara	833	0.489
Bus Terminal	1	Khepupara	332,330,329,334,335	3.09
Truck Terminal	1	Khepupara	208, 213	0.51
Rickshaw stand	3	Khepupara	360,362	0.31
Fuel station	3	Khepupara	347,346,350,351,352	0.19
Tempo Stand	1	Khepupara	335,337	0.34
Waste Disposal Site	1	Khepupara	133-36,149, 152-53, 282	6.32
Electric Sub-Station	5	Khepupara	499, 501-502	1.22
Waste transfer station	1	Khepupara	179,268	0.079
	2	Khepupara	612,639	0.058
	3	Khepupara	401	0.153
	4	Khepupara	838,842	0.107
	5	Khepupara	473-74	0.069
	7	Khepupara	986	0.195
	8	Khepupara	949	0.059
		Khepupara	1027-1028	0.240
	9	Badurtali	671-72	0.174

সমাপনি বক্তব্যে মেয়র মহোদয় পরামর্শক প্রতিষ্ঠানের পরিকল্পণাবিদগণকে এবং স্থানীয় সরকার প্রকৌশল অধিদপ্তরকে পৌরসভার মহাপরিকল্পণা প্রনয়নের জন্য পুনরায় ধন্যবাদ জ্ঞাপন করেন এবং সম্ভাব্য সকল দিকনির্দেশনাগুলি সন্নিবেশিত করে যথাশীঘ্রসম্ভব চুড়ান্ত মহাপরিকল্পণা প্রণয়ন করার জন্য অনুরোধ করেন। সভায় আর কোন আলোচনা না থাকায় তিনি সকলকে ধন্যবাদ জানিয়ে পৌরসভার স্বপ্ন বাস্তবায়নের আশা ব্যক্ত করে সভার কার্যক্রম সমাপ্তি ঘোষণা করেন।

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(জনাব এস এম রাকিবুল আহসান)

মেয়র

কলাপাড়াপৌরসভা

স্থানীয় সরকার প্রকৌশল অধিদপ্তর, ঢাকা-১২০৭

উপজেলা শহর অবকাঠামো উন্নয়ন প্রকল্প, প্যাকেজ-১১

কলাপাড়া পৌরসভার মহাপরিকল্পনার উপর চূড়ান্ত মতবিনিময় সভা

কলাপাড়া পৌরসভা।

স্থানঃ কলাপাড়া পৌরসভা। তারিখঃ ২৬ ফেব্রুয়ারি, ২০১৪ খ্রিঃ; সকাল ১১:০০ ঘটিকা

অংশগ্রহনকারীর তালিকা

ক্রমিক নং	নাম	প্রতিষ্ঠান ও পদবী	ফোন নম্বর	স্বাক্ষর
১	এস.এম রাকিবুল আহসান	মেম্বার, কলাপাড়া পৌরসভা	01726048872	[illegible] ২৬/০২/১৪
২	মো: মাসুম বিল্লাহ	সচিব, কলাপাড়া পৌরসভা	01712670387	[illegible] 26/2/14
৩	সৈয়দ নাসির উদ্দিন	প্রভাষক, কলাপাড়া মহিলা কলেজ	01190934907	[illegible] 26/2/14
৪	মো: ইসমাইল হোসেন [illegible]	কাউন্সিলর সংরক্ষিত, কলাপাড়া পৌরসভা	01718413700	ইসমাইল
৫	মো: আমান উল্লাহ	প্রাক্তন/প্রধান শিক্ষক, [illegible]	01718856700	[illegible] 23/2/2014
৬	মোঃ দেলোয়ার হোসেন	সি.বি.ও – সভা পতি, ৪নং ওয়ার্ড	০১৭৪৩৫ ৬৩০৩৫	মোঃ দেলোয়ার
৭	আজিজ [illegible] সরকার	প্রা: শিক্ষক, [illegible] সঃ প্রাঃ বিদ্যালয়	01716678257	[illegible] 26/2/14
৮	সাথী [illegible]	প্রাঃ শিঃ, [illegible] সঃ প্রাঃ বিদ্যালয়	01678567654	[illegible] 26/2/14
৯	বিমল চন্দ্র পন্ডিত	প্রা: শি:, [illegible] সঃ প্রাঃ বিদ্যালয়	01744316750	বিমল [illegible] 26/2/14
১০	মো: হাসান সিকদার	সংরক্ষিত কাউন্সিলর, ৯ নং ওয়ার্ড	01718571953	[illegible] 26/2/14
১১	মোঃ জাহাঙ্গীর আলম	প্রধান শিক্ষক, রহমতপুর কেজি [illegible] সঃ প্রাঃ বিদ্যালয়, কলাপাড়া	01733152547	[illegible] ২৬.০২.১৪

ক্রমিক নং	নাম	প্রতিষ্ঠান ও পদবী	ফোন নম্বর	স্বাক্ষর
১২	আয়েশা আক্তার ~~কৈশোর কিশো~~	কৈশোর কিশোর কলাপাড়া পৌরসভা	01723905198	আয়েশা আক্তার
১৩	সুলতানা রাজিয়া	হিসাব সহকারী কলাপাড়া পৌরসভা	01770359958	রাজিয়া 26/2/24
১৪	ফেরদৌসী আক্তার	টিকাদানকারী সুপারভাইজার	01924498679	[illegible]
১৫	মোঃ বেলায়েত হোসেন	টিকাদানকারী	0171697[illegible]	বেলায়েত
১৬	মোঃ রফিকুল ইসলাম	কর নির্ধারক	01716573460	[illegible]
১৭	কার্তিক চন্দ্র গুহ	হিসাব রক্ষক কলাপাড়া পৌরসভা	01711120248	[illegible]
১৮	কাব্য লাল চক্রবর্তী	A/O কলাপাড়া পৌরসভা	01710478893	[illegible]
১৯	মোঃ জাহাঙ্গীর হোসেন	পাম্প চালক কলাপাড়া পৌরসভা	01724995593	[illegible]
২০	মোঃ আলমগীর হোসেন	বিল ক্লার্ক	0174913[illegible]80	[illegible]
২১	মোঃ মিজানুজ্জামান	সহকারী প্রকৌশলী কলাপাড়া পৌরসভা	01990622638	[illegible]
২২	Md. Humaun Kabir	Councelor Ward No-2 Kalapara Pourasava	01715384541	Kabir
২৩	[illegible]	কাউন্সিলর	01912677668	[illegible]
২৪	মোঃ মতিয়ুর রহমান মিঠু	কাউন্সিলর	01716251456	[illegible]
২৫	মোঃ আঃ রাজ্জাক হাং	কাউন্সিলর কলাপাড়া পৌরসভা	01716225886	[illegible]

ক্রমিক নং	নাম	প্রতিষ্ঠান ও পদবী	ফোন নম্বর	স্বাক্ষর
২৬	[illegible]	[illegible] কমিশনারেট [illegible]	০১৭১৬৫৫৪৫৬৬ ৭২	২৬/২/১৮
২৭	মোঃ মামুন আলি	কম্পিউটার অপারেটর/ উপ-সহকারী প্রকৌশলী (বিদ্যুৎ)	01712534825	[illegible] 25/2/18
২৮	কামাল চন্দ্র কুন্ডু	সহকারী কর আদায়কারী	01712459137	[illegible] 26.2.14
২৯	মাহবুবুর রহমান	কর [illegible]	01725439277	[illegible] 26,2,18
৩০	মোঃ নুরুল হক	কনজারভেন্সি ইন্সপেক্টর	01710938688	[illegible] ২৬/০২/২০১৮ইং
৩১	সৈয়দ হাসানুর রহমান	সহকারী কর আদায়কারী	০১৭১৪৭৩৩০ -৯৬	Hasan ২৬/২/১৮ইং
৩২	সাবের হোসেন	আদায়কারী (বাজার শাখা)	01012931115	[illegible] 25/2/18
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Phase wise Road Network Development proposal of Kalapara Paurashava

Proposed Road ID	Proposed Hierarchy	Ward No	Proposed Type	Existing width (ft)	Proposed width (ft)	Length (m)	Phasing
PR-1	Primary Road	Ward No.-1	Extended	24	150	640.85	1st Phase
PR-1	Primary Road	Ward No.-3	Extended	24	150	346.52	1st Phase
PR-2	Primary Road	Ward No.-9	Extended	10	80	48.24	1st Phase
PR-2	Primary Road	Ward No.-7	Extended	10	80	40.51	1st Phase
PR-3	Primary Road	Ward No.-5	New	0	80	213.29	2nd Phase
PR-3	Primary Road	Ward No.-3	New	0	80	351.95	2nd Phase
PR-4	Primary Road	Ward No.-9	Extended	16	60	1146.64	1st Phase
PR-4	Primary Road	Ward No.-8	Extended	16	60	546.89	1st Phase
PR-4	Primary Road	Ward No.-6	Extended	16	60	213.14	1st Phase
PR-4	Primary Road	Ward No.-2	Extended	16	60	580.58	1st Phase
PR-4	Primary Road	Ward No.-1	Extended	16	60	377.88	1st Phase
PR-5	Primary Road	Ward No.-9	Extended	10	60	565.43	1st Phase
PR-5	Primary Road	Ward No.-8	Extended	10	60	196.56	1st Phase
SR-1	Secondary Road	Ward No.-1	Extended	12	40	794.71	1st Phase
SR-2	Secondary Road	Ward No.-2	Extended	10	40	559.76	1st Phase
SR-2	Secondary Road	Ward No.-1	Extended	10	40	372.89	1st Phase
SR-3	Secondary Road	Ward No.-3	Extended	8	40	280.79	1st Phase
SR-4	Secondary Road	Ward No.-8	Extended	10	40	470.85	1st Phase
SR-5	Secondary Road	Ward No.-9	Extended	10	40	452.51	1st Phase
SR-5	Secondary Road	Ward No.-8	Extended	10	40	365.72	1st Phase
SR-5	Secondary Road	Ward No.-8	Extended	10	40	647.81	1st Phase
SR-5	Secondary Road	Ward No.-7	Extended	10	40	647.81	1st Phase
SR-5	Secondary Road	Ward No.-6	Extended	10	40	3.54	1st Phase
SR-5	Secondary Road	Ward No.-7	Extended	10	40	176.59	1st Phase
SR-6	Secondary Road	Ward No.-6	Extended	8	40	396.21	1st Phase
SR-7	Secondary Road	Ward No.-6	Extended	10	40	75.29	1st Phase
SR-7	Secondary Road	Ward No.-7	Extended	10	40	1.43	1st Phase
SR-7	Secondary Road	Ward No.-4	Extended	10	40	179.23	1st Phase
SR-8	Secondary Road	Ward No.-4	Extended	8	40	439.92	1st Phase
SR-8	Secondary Road	Ward No.-3	Extended	8	40	401.42	1st Phase
SR-9	Secondary Road	Ward No.-9	Extended	6	40	321.26	1st Phase
SR-9	Secondary Road	Ward No.-8	Extended	6	40	3.61	1st Phase
SR-10	Secondary Road	Ward No.-1	Extended	6	40	369.19	1st Phase
SR-11	Secondary Road	Ward No.-4	Extended	10	40	227.84	1st Phase
SR-11	Secondary Road	Ward No.-5	Extended	10	40	668.23	2nd Phase
SR-12	Secondary Road	Ward No.-1	New	0	40	324.45	2nd Phase
SR-13	Secondary Road	Ward No.-3	Extended	8	40	161.11	2nd Phase
SR-14	Secondary Road	Ward No.-1	New	0	40	487.85	2nd Phase
SR-15	Secondary Road	Ward No.-1	Extended	6	40	170.76	2nd Phase
SR-16	Secondary Road	Ward No.-1	Extended	6	40	412.87	2nd Phase
SR-17	Secondary Road	Ward No.-1	New	0	40	432.91	2nd Phase
SR-18	Secondary Road	Ward No.-4	Extended	10	40	340.69	2nd Phase
SR-18	Secondary Road	Ward No.-3	Extended	10	40	376.29	2nd Phase
SR-19	Secondary Road	Ward No.-1	Extended	10	40	146.10	2nd Phase
SR-19	Secondary Road	Ward No.-3	Extended	10	40	74.24	2nd Phase
SR-20	Secondary Road	Ward No.-3	Extended	10	40	557.98	2nd Phase
SR-21	Secondary Road	Ward No.-1	Extended	6	40	315.90	2nd Phase
SR-22	Secondary Road	Ward No.-1	Extended	6	40	537.25	2nd Phase
SR-23	Secondary Road	Ward No.-1	New	0	40	659.52	2nd Phase
SR-24	Secondary Road	Ward No.-1	New	0	40	1055.30	2nd Phase
SR-26	Secondary Road	Ward No.-3	Extended	8	40	90.41	2nd Phase
SR-5	Secondary Road	Ward No.-8	Extended	10	40	0.51	2nd Phase
SR-5	Secondary Road	Ward No.-6	Extended	10	40	0.51	2nd Phase
SR-5	Secondary Road	Ward No.-7	Extended	10	40	0.51	2nd Phase
TR-1	Tertiary Road	Ward No.-7	Extended	8	30	478.59	3rd Phase
TR-1	Tertiary Road	Ward No.-5	Extended	8	30	24.72	3rd Phase
TR-2	Tertiary Road	Ward No.-6	Extended	10	30	170.59	3rd Phase
TR-3	Tertiary Road	Ward No.-9	Extended	10	30	1155.64	3rd Phase
TR-4	Tertiary Road	Ward No.-8	Extended	10	30	243.02	3rd Phase

Phase wise Road Network Development proposal of Kalapara Paurashava

Proposed Road ID	Proposed Hierarchy	Ward No	Proposed Type	Existing width (ft)	Proposed width (ft)	Length (m)	Phasing
TR-4	Tertiary Road	Ward No.-6	Extended	10	30	2.12	3rd Phase
TR-5	Tertiary Road	Ward No.-1	Extended	6	20	32.49	2nd Phase
TR-6	Tertiary Road	Ward No.-1	Extended	6	20	117.01	2nd Phase
TR-7	Tertiary Road	Ward No.-1	Extended	6	20	17.64	2nd Phase
TR-8	Tertiary Road	Ward No.-1	Extended	6	20	18.07	2nd Phase
TR-9	Tertiary Road	Ward No.-1	Extended	6	20	25.45	2nd Phase
TR-10	Tertiary Road	Ward No.-1	Extended	6	20	831.40	2nd Phase
TR-10	Tertiary Road	Ward No.-3	Extended	6	20	7.10	2nd Phase
TR-11	Tertiary Road	Ward No.-1	Extended	6	20	49.55	2nd Phase
TR-12	Tertiary Road	Ward No.-1	Extended	6	20	156.47	2nd Phase
TR-13	Tertiary Road	Ward No.-1	Extended	6	20	21.15	2nd Phase
TR-14	Tertiary Road	Ward No.-1	Extended	6	20	106.81	2nd Phase
TR-15	Tertiary Road	Ward No.-1	Extended	6	20	9.25	2nd Phase
TR-16	Tertiary Road	Ward No.-1	Extended	6	20	53.04	2nd Phase
TR-16	Tertiary Road	Ward No.-3	Extended	6	20	4.95	2nd Phase
TR-17	Tertiary Road	Ward No.-1	Extended	6	20	33.88	2nd Phase
TR-17	Tertiary Road	Ward No.-3	Extended	6	20	4.84	2nd Phase
TR-18	Tertiary Road	Ward No.-1	Extended	6	20	125.29	2nd Phase
TR-18	Tertiary Road	Ward No.-3	Extended	6	20	5.17	2nd Phase
TR-19	Tertiary Road	Ward No.-1	Extended	6	20	394.79	2nd Phase
TR-20	Tertiary Road	Ward No.-1	Extended	8	20	744.61	2nd Phase
TR-21	Tertiary Road	Ward No.-1	Extended	6	20	324.67	2nd Phase
TR-22	Tertiary Road	Ward No.-1	Extended	6	20	80.37	2nd Phase
TR-23	Tertiary Road	Ward No.-1	Extended	6	20	44.06	2nd Phase
TR-24	Tertiary Road	Ward No.-1	Extended	6	20	198.36	2nd Phase
TR-25	Tertiary Road	Ward No.-1	Extended	8	20	299.04	2nd Phase
TR-26	Tertiary Road	Ward No.-1	Extended	8	20	165.26	2nd Phase
TR-27	Tertiary Road	Ward No.-1	Extended	6	20	18.06	2nd Phase
TR-28	Tertiary Road	Ward No.-1	Extended	6	20	15.50	2nd Phase
TR-29	Tertiary Road	Ward No.-1	Extended	6	20	47.28	2nd Phase
TR-30	Tertiary Road	Ward No.-1	Extended	6	20	29.42	2nd Phase
TR-31	Tertiary Road	Ward No.-1	Extended	6	20	156.41	2nd Phase
TR-32	Tertiary Road	Ward No.-1	Extended	6	20	88.16	2nd Phase
TR-33	Tertiary Road	Ward No.-1	Extended	8	20	453.47	2nd Phase
TR-34	Tertiary Road	Ward No.-3	Extended	6	20	130.21	2nd Phase
TR-35	Tertiary Road	Ward No.-3	Extended	6	20	208.40	2nd Phase
TR-36	Tertiary Road	Ward No.-3	Extended	6	20	68.67	2nd Phase
TR-37	Tertiary Road	Ward No.-3	Extended	6	20	50.42	2nd Phase
TR-38	Tertiary Road	Ward No.-3	Extended	6	20	32.09	2nd Phase
TR-39	Tertiary Road	Ward No.-3	Extended	6	20	142.12	2nd Phase
TR-40	Tertiary Road	Ward No.-1	Extended	6	20	2.48	2nd Phase
TR-40	Tertiary Road	Ward No.-3	Extended	6	20	119.66	2nd Phase
TR-41	Tertiary Road	Ward No.-1	Extended	6	20	3.17	2nd Phase
TR-41	Tertiary Road	Ward No.-3	Extended	6	20	30.65	2nd Phase
TR-42	Tertiary Road	Ward No.-1	Extended	4	20	238.70	2nd Phase
TR-42	Tertiary Road	Ward No.-3	Extended	4	20	5.32	2nd Phase
TR-43	Tertiary Road	Ward No.-2	Extended	6	20	88.37	2nd Phase
TR-43	Tertiary Road	Ward No.-1	Extended	6	20	283.78	2nd Phase
TR-44	Tertiary Road	Ward No.-2	Extended	4	20	29.72	2nd Phase
TR-45	Tertiary Road	Ward No.-2	Extended	10	20	30.91	2nd Phase
TR-45	Tertiary Road	Ward No.-4	Extended	10	20	17.96	2nd Phase
TR-46	Tertiary Road	Ward No.-4	Extended	8	20	36.09	2nd Phase
TR-47	Tertiary Road	Ward No.-1	Extended	8	20	101.05	2nd Phase
TR-48	Tertiary Road	Ward No.-2	Extended	8	20	11.82	2nd Phase
TR-48	Tertiary Road	Ward No.-1	Extended	8	20	112.38	2nd Phase
TR-49	Tertiary Road	Ward No.-1	Extended	12	20	50.04	2nd Phase
TR-50	Tertiary Road	Ward No.-1	Extended	10	20	114.98	2nd Phase
TR-51	Tertiary Road	Ward No.-1	Extended	6	20	152.65	2nd Phase
TR-52	Tertiary Road	Ward No.-6	Extended	10	20	25.51	2nd Phase

Phase wise Road Network Development proposal of Kalapara Paurashava

Proposed Road ID	Proposed Hierarchy	Ward No	Proposed Type	Existing width (ft)	Proposed width (ft)	Length (m)	Phasing
TR-52	Tertiary Road	Ward No.-2	Extended	10	20	518.69	2nd Phase
TR-53	Tertiary Road	Ward No.-2	Extended	6	20	8.83	2nd Phase
TR-54	Tertiary Road	Ward No.-2	Extended	6	20	47.27	2nd Phase
TR-55	Tertiary Road	Ward No.-2	Extended	8	20	112.31	2nd Phase
TR-56	Tertiary Road	Ward No.-2	Extended	6	20	25.57	2nd Phase
TR-57	Tertiary Road	Ward No.-2	Extended	6	20	38.36	2nd Phase
TR-58	Tertiary Road	Ward No.-2	Extended	8	20	67.59	2nd Phase
TR-59	Tertiary Road	Ward No.-2	Extended	6	20	57.17	2nd Phase
TR-60	Tertiary Road	Ward No.-2	Extended	6	20	55.74	2nd Phase
TR-61	Tertiary Road	Ward No.-2	Extended	8	20	20.81	2nd Phase
TR-62	Tertiary Road	Ward No.-2	Extended	8	20	20.71	2nd Phase
TR-63	Tertiary Road	Ward No.-2	Extended	8	20	23.59	2nd Phase
TR-64	Tertiary Road	Ward No.-2	Extended	8	20	83.49	2nd Phase
TR-65	Tertiary Road	Ward No.-2	Extended	8	20	176.08	2nd Phase
TR-66	Tertiary Road	Ward No.-2	Extended	6	20	23.33	2nd Phase
TR-67	Tertiary Road	Ward No.-2	Extended	8	20	96.98	2nd Phase
TR-68	Tertiary Road	Ward No.-2	Extended	6	20	62.53	2nd Phase
TR-69	Tertiary Road	Ward No.-2	Extended	6	20	59.62	2nd Phase
TR-70	Tertiary Road	Ward No.-2	Extended	6	20	83.20	2nd Phase
TR-71	Tertiary Road	Ward No.-2	Extended	6	20	35.22	2nd Phase
TR-72	Tertiary Road	Ward No.-2	Extended	6	20	26.38	2nd Phase
TR-73	Tertiary Road	Ward No.-2	Extended	6	20	60.47	2nd Phase
TR-74	Tertiary Road	Ward No.-2	Extended	6	20	98.52	3rd Phase
TR-75	Tertiary Road	Ward No.-2	Extended	6	20	131.39	3rd Phase
TR-76	Tertiary Road	Ward No.-2	Extended	4	20	12.95	3rd Phase
TR-77	Tertiary Road	Ward No.-2	Extended	16	20	35.06	3rd Phase
TR-78	Tertiary Road	Ward No.-2	Extended	6	20	39.83	3rd Phase
TR-79	Tertiary Road	Ward No.-2	Extended	4	20	38.18	3rd Phase
TR-80	Tertiary Road	Ward No.-2	Extended	6	20	37.26	3rd Phase
TR-81	Tertiary Road	Ward No.-2	Extended	4	20	33.93	3rd Phase
TR-82	Tertiary Road	Ward No.-6	Extended	6	20	55.21	3rd Phase
TR-83	Tertiary Road	Ward No.-6	Extended	8	20	51.01	3rd Phase
TR-84	Tertiary Road	Ward No.-8	Extended	6	20	44.65	3rd Phase
TR-84	Tertiary Road	Ward No.-6	Extended	6	20	37.22	3rd Phase
TR-85	Tertiary Road	Ward No.-8	Extended	6	20	4.96	3rd Phase
TR-85	Tertiary Road	Ward No.-6	Extended	6	20	16.93	3rd Phase
TR-86	Tertiary Road	Ward No.-8	Extended	6	20	86.80	3rd Phase
TR-87	Tertiary Road	Ward No.-8	Extended	4	20	51.61	3rd Phase
TR-88	Tertiary Road	Ward No.-7	Extended	8	20	97.69	3rd Phase
TR-89	Tertiary Road	Ward No.-7	Extended	8	20	45.55	3rd Phase
TR-90	Tertiary Road	Ward No.-7	Extended	8	20	181.01	3rd Phase
TR-90	Tertiary Road	Ward No.-5	Extended	8	20	529.78	3rd Phase
TR-91	Tertiary Road	Ward No.-7	Extended	6	20	263.97	3rd Phase
TR-92	Tertiary Road	Ward No.-7	Extended	6	20	74.54	3rd Phase
TR-92	Tertiary Road	Ward No.-5	Extended	6	20	3.44	3rd Phase
TR-93	Tertiary Road	Ward No.-7	Extended	6	20	79.14	3rd Phase
TR-95	Tertiary Road	Ward No.-8	Extended	4	20	39.10	3rd Phase
TR-96	Tertiary Road	Ward No.-8	Extended	4	20	136.33	3rd Phase
TR-97	Tertiary Road	Ward No.-8	Extended	10	20	3.56	3rd Phase
TR-97	Tertiary Road	Ward No.-6	Extended	10	20	323.09	3rd Phase
TR-97	Tertiary Road	Ward No.-7	Extended	10	20	1.46	3rd Phase
TR-98	Tertiary Road	Ward No.-8	Extended	6	20	51.65	3rd Phase
TR-98	Tertiary Road	Ward No.-6	Extended	6	20	2.64	3rd Phase
TR-99	Tertiary Road	Ward No.-8	Extended	6	20	152.77	3rd Phase
TR-100	Tertiary Road	Ward No.-8	Extended	6	20	51.54	3rd Phase
TR-101	Tertiary Road	Ward No.-6	Extended	6	20	169.65	3rd Phase
TR-102	Tertiary Road	Ward No.-7	Extended	8	20	241.68	3rd Phase
TR-103	Tertiary Road	Ward No.-7	Extended	6	20	92.35	3rd Phase
TR-104	Tertiary Road	Ward No.-7	Extended	8	20	339.14	3rd Phase

Phase wise Road Network Development proposal of Kalapara Paurashava

Proposed Road ID	Proposed Hierarchy	Ward No	Proposed Type	Existing width (ft)	Proposed width (ft)	Length (m)	Phasing
TR-105	Tertiary Road	Ward No.-7	Extended	6	20	39.75	3rd Phase
TR-106	Tertiary Road	Ward No.-7	Extended	8	20	776.10	3rd Phase
TR-107	Tertiary Road	Ward No.-7	Extended	6	20	27.41	3rd Phase
TR-108	Tertiary Road	Ward No.-7	Extended	8	20	61.16	3rd Phase
TR-109	Tertiary Road	Ward No.-7	Extended	6	20	89.40	3rd Phase
TR-110	Tertiary Road	Ward No.-8	Extended	4	20	2.94	3rd Phase
TR-110	Tertiary Road	Ward No.-6	Extended	4	20	10.22	3rd Phase
TR-111	Tertiary Road	Ward No.-6	Extended	6	20	29.85	3rd Phase
TR-112	Tertiary Road	Ward No.-6	Extended	6	20	100.32	3rd Phase
TR-113	Tertiary Road	Ward No.-2	Extended	6	20	52.80	3rd Phase
TR-114	Tertiary Road	Ward No.-2	Extended	4	20	48.72	3rd Phase
TR-115	Tertiary Road	Ward No.-6	Extended	6	20	248.29	3rd Phase
TR-116	Tertiary Road	Ward No.-6	Extended	4	20	60.44	3rd Phase
TR-117	Tertiary Road	Ward No.-6	Extended	10	20	123.67	3rd Phase
TR-117	Tertiary Road	Ward No.-2	Extended	10	20	100.26	3rd Phase
TR-118	Tertiary Road	Ward No.-2	Extended	8	20	98.86	3rd Phase
TR-119	Tertiary Road	Ward No.-6	Extended	6	20	136.02	3rd Phase
TR-120	Tertiary Road	Ward No.-2	Extended	6	20	23.17	3rd Phase
TR-121	Tertiary Road	Ward No.-6	Extended	6	20	77.07	3rd Phase
TR-122	Tertiary Road	Ward No.-7	Extended	6	20	15.28	3rd Phase
TR-122	Tertiary Road	Ward No.-5	Extended	6	20	96.53	3rd Phase
TR-123	Tertiary Road	Ward No.-5	Extended	6	20	48.26	3rd Phase
TR-124	Tertiary Road	Ward No.-5	Extended	6	20	50.86	3rd Phase
TR-125	Tertiary Road	Ward No.-4	Extended	6	20	172.65	3rd Phase
TR-125	Tertiary Road	Ward No.-3	Extended	6	20	27.85	3rd Phase
TR-126	Tertiary Road	Ward No.-3	Extended	10	20	19.52	3rd Phase
TR-127	Tertiary Road	Ward No.-3	Extended	10	20	20.23	3rd Phase
TR-128	Tertiary Road	Ward No.-3	Extended	8	20	534.49	3rd Phase
TR-129	Tertiary Road	Ward No.-4	Extended	10	20	125.02	3rd Phase
TR-129	Tertiary Road	Ward No.-3	Extended	10	20	39.91	3rd Phase
TR-130	Tertiary Road	Ward No.-3	Extended	6	20	35.46	3rd Phase
TR-131	Tertiary Road	Ward No.-4	Extended	8	20	124.10	3rd Phase
TR-132	Tertiary Road	Ward No.-4	Extended	6	20	87.05	3rd Phase
TR-133	Tertiary Road	Ward No.-4	Extended	10	20	251.31	3rd Phase
TR-133	Tertiary Road	Ward No.-3	Extended	10	20	6.61	3rd Phase
TR-134	Tertiary Road	Ward No.-4	Extended	6	20	68.66	3rd Phase
TR-135	Tertiary Road	Ward No.-4	Extended	8	20	91.34	3rd Phase
TR-136	Tertiary Road	Ward No.-4	Extended	8	20	220.09	3rd Phase
TR-137	Tertiary Road	Ward No.-4	Extended	8	20	127.44	3rd Phase
TR-138	Tertiary Road	Ward No.-4	Extended	10	20	126.77	3rd Phase
TR-139	Tertiary Road	Ward No.-5	Extended	6	20	211.51	3rd Phase
TR-140	Tertiary Road	Ward No.-5	Extended	6	20	400.00	3rd Phase
TR-141	Tertiary Road	Ward No.-5	Extended	8	20	79.33	3rd Phase
TR-142	Tertiary Road	Ward No.-4	Extended	6	20	37.18	3rd Phase
TR-143	Tertiary Road	Ward No.-4	Extended	6	20	56.08	3rd Phase
TR-144	Tertiary Road	Ward No.-4	Extended	6	20	22.44	3rd Phase
TR-145	Tertiary Road	Ward No.-4	Extended	6	20	2.37	3rd Phase
TR-145	Tertiary Road	Ward No.-3	Extended	6	20	72.57	3rd Phase
TR-146	Tertiary Road	Ward No.-4	Extended	6	20	14.39	3rd Phase
TR-146	Tertiary Road	Ward No.-5	Extended	6	20	333.60	3rd Phase
TR-147	Tertiary Road	Ward No.-3	Extended	6	20	46.99	3rd Phase
TR-148	Tertiary Road	Ward No.-3	Extended	8	20	163.01	3rd Phase
TR-149	Tertiary Road	Ward No.-3	Extended	6	20	21.37	3rd Phase
TR-150	Tertiary Road	Ward No.-3	Extended	6	20	22.50	3rd Phase
TR-151	Tertiary Road	Ward No.-3	Extended	6	20	24.04	3rd Phase
TR-152	Tertiary Road	Ward No.-3	Extended	6	20	64.50	3rd Phase
TR-153	Tertiary Road	Ward No.-9	Extended	10	20	685.65	3rd Phase
TR-153	Tertiary Road	Ward No.-8	Extended	10	20	61.11	3rd Phase
TR-154	Tertiary Road	Ward No.-9	Extended	8	20	547.84	3rd Phase

Phase wise Road Network Development proposal of Kalapara Paurashava

Proposed Road ID	Proposed Hierarchy	Ward No	Proposed Type	Existing width (ft)	Proposed width (ft)	Length (m)	Phasing
TR-155	Tertiary Road	Ward No.-9	Extended	6	20	176.32	3rd Phase
TR-156	Tertiary Road	Ward No.-9	Extended	6	20	104.80	3rd Phase
TR-157	Tertiary Road	Ward No.-9	Extended	6	20	96.35	3rd Phase
TR-158	Tertiary Road	Ward No.-9	Extended	6	20	105.36	3rd Phase
TR-159	Tertiary Road	Ward No.-9	Extended	6	20	65.82	3rd Phase
TR-160	Tertiary Road	Ward No.-9	Extended	8	20	357.96	3rd Phase
TR-161	Tertiary Road	Ward No.-9	Extended	6	20	26.68	3rd Phase
TR-162	Tertiary Road	Ward No.-9	Extended	6	20	21.53	3rd Phase
TR-163	Tertiary Road	Ward No.-9	Extended	8	20	464.50	3rd Phase
TR-164	Tertiary Road	Ward No.-9	Extended	6	20	48.08	3rd Phase
TR-165	Tertiary Road	Ward No.-9	Extended	6	20	74.48	3rd Phase
TR-166	Tertiary Road	Ward No.-9	Extended	6	20	71.20	3rd Phase
TR-167	Tertiary Road	Ward No.-9	Extended	8	20	41.49	3rd Phase
TR-168	Tertiary Road	Ward No.-9	Extended	6	20	29.83	3rd Phase
TR-169	Tertiary Road	Ward No.-9	Extended	6	20	36.14	3rd Phase
TR-170	Tertiary Road	Ward No.-9	Extended	6	20	250.26	3rd Phase
TR-171	Tertiary Road	Ward No.-9	Extended	6	20	74.80	3rd Phase
TR-172	Tertiary Road	Ward No.-9	Extended	8	20	18.74	3rd Phase
TR-173	Tertiary Road	Ward No.-9	Extended	6	20	36.15	3rd Phase
TR-174	Tertiary Road	Ward No.-9	Extended	6	20	23.88	3rd Phase
TR-175	Tertiary Road	Ward No.-9	Extended	6	20	25.32	3rd Phase
TR-176	Tertiary Road	Ward No.-9	Extended	6	20	23.19	3rd Phase
TR-177	Tertiary Road	Ward No.-9	Extended	6	20	40.13	3rd Phase
TR-178	Tertiary Road	Ward No.-9	Extended	8	20	157.88	3rd Phase
TR-179	Tertiary Road	Ward No.-9	Extended	6	20	54.51	3rd Phase
TR-180	Tertiary Road	Ward No.-9	Extended	6	20	17.44	3rd Phase
TR-181	Tertiary Road	Ward No.-9	Extended	6	20	14.71	3rd Phase
TR-182	Tertiary Road	Ward No.-9	Extended	6	20	19.10	3rd Phase
TR-183	Tertiary Road	Ward No.-9	Extended	6	20	33.19	3rd Phase
TR-184	Tertiary Road	Ward No.-9	Extended	6	20	56.57	3rd Phase
TR-185	Tertiary Road	Ward No.-9	Extended	6	20	87.56	3rd Phase
TR-186	Tertiary Road	Ward No.-9	Extended	6	20	33.47	3rd Phase
TR-187	Tertiary Road	Ward No.-9	Extended	8	20	142.63	3rd Phase
TR-188	Tertiary Road	Ward No.-9	Extended	4	20	15.15	3rd Phase
TR-189	Tertiary Road	Ward No.-9	Extended	6	20	153.26	3rd Phase
TR-190	Tertiary Road	Ward No.-9	Extended	6	20	99.26	3rd Phase
TR-191	Tertiary Road	Ward No.-9	Extended	6	20	31.76	3rd Phase
TR-192	Tertiary Road	Ward No.-9	Extended	8	20	176.78	3rd Phase
TR-193	Tertiary Road	Ward No.-9	Extended	6	20	24.26	3rd Phase
TR-194	Tertiary Road	Ward No.-9	Extended	6	20	348.13	3rd Phase
TR-195	Tertiary Road	Ward No.-9	Extended	6	20	29.76	3rd Phase
TR-196	Tertiary Road	Ward No.-9	Extended	8	20	44.40	3rd Phase
TR-197	Tertiary Road	Ward No.-9	Extended	6	20	197.74	3rd Phase
TR-198	Tertiary Road	Ward No.-9	Extended	6	20	15.60	3rd Phase
TR-199	Tertiary Road	Ward No.-9	Extended	4	20	139.42	3rd Phase
TR-200	Tertiary Road	Ward No.-9	Extended	6	20	366.61	3rd Phase
TR-200	Tertiary Road	Ward No.-8	Extended	6	20	46.94	3rd Phase
TR-201	Tertiary Road	Ward No.-9	Extended	6	20	200.64	3rd Phase
TR-202	Tertiary Road	Ward No.-9	Extended	4	20	64.15	3rd Phase
TR-203	Tertiary Road	Ward No.-9	Extended	6	20	18.17	3rd Phase
TR-204	Tertiary Road	Ward No.-9	Extended	6	20	65.49	3rd Phase
TR-205	Tertiary Road	Ward No.-9	Extended	6	20	136.81	3rd Phase
TR-206	Tertiary Road	Ward No.-9	Extended	4	20	11.44	3rd Phase
TR-207	Tertiary Road	Ward No.-9	Extended	4	20	14.33	3rd Phase
TR-208	Tertiary Road	Ward No.-9	Extended	6	20	11.25	3rd Phase
TR-209	Tertiary Road	Ward No.-9	Extended	4	20	51.39	3rd Phase
TR-210	Tertiary Road	Ward No.-9	Extended	4	20	34.78	3rd Phase
TR-211	Tertiary Road	Ward No.-9	Extended	6	20	75.13	3rd Phase
TR-212	Tertiary Road	Ward No.-9	Extended	6	20	0.71	3rd Phase

Phase wise Road Network Development proposal of Kalapara Paurashava

Proposed Road ID	Proposed Hierarchy	Ward No	Proposed Type	Existing width (ft)	Proposed width (ft)	Length (m)	Phasing
TR-212	Tertiary Road	Ward No.-7	Extended	6	20	110.56	3rd Phase
TR-213	Tertiary Road	Ward No.-9	Extended	6	20	57.41	3rd Phase
TR-213	Tertiary Road	Ward No.-8	Extended	6	20	283.37	3rd Phase
TR-214	Tertiary Road	Ward No.-9	Extended	6	20	1.28	3rd Phase
TR-214	Tertiary Road	Ward No.-8	Extended	6	20	20.68	3rd Phase
TR-215	Tertiary Road	Ward No.-9	Extended	4	20	15.15	3rd Phase
TR-216	Tertiary Road	Ward No.-9	Extended	4	20	10.04	3rd Phase
TR-217	Tertiary Road	Ward No.-9	Extended	4	20	11.14	3rd Phase
TR-218	Tertiary Road	Ward No.-8	Extended	6	20	145.23	3rd Phase
TR-219	Tertiary Road	Ward No.-8	Extended	6	20	145.79	3rd Phase
TR-220	Tertiary Road	Ward No.-8	Extended	6	20	11.84	3rd Phase
TR-221	Tertiary Road	Ward No.-8	Extended	6	20	79.32	3rd Phase
TR-222	Tertiary Road	Ward No.-8	Extended	6	20	15.70	3rd Phase
TR-223	Tertiary Road	Ward No.-7	Extended	6	20	38.69	3rd Phase
TR-224	Tertiary Road	Ward No.-8	Extended	6	20	249.26	3rd Phase
TR-225	Tertiary Road	Ward No.-8	Extended	6	20	72.04	3rd Phase
TR-226	Tertiary Road	Ward No.-8	Extended	6	20	338.93	3rd Phase
TR-227	Tertiary Road	Ward No.-9	Extended	6	20	72.31	3rd Phase
TR-228	Tertiary Road	Ward No.-8	Extended	6	20	49.01	3rd Phase
TR-229	Tertiary Road	Ward No.-8	Extended	6	20	29.77	3rd Phase
TR-230	Tertiary Road	Ward No.-8	Extended	6	20	28.39	3rd Phase
TR-231	Tertiary Road	Ward No.-8	Extended	6	20	13.51	3rd Phase
TR-232	Tertiary Road	Ward No.-8	Extended	6	20	20.83	3rd Phase
TR-233	Tertiary Road	Ward No.-8	Extended	6	20	29.57	3rd Phase
TR-234	Tertiary Road	Ward No.-8	Extended	8	20	52.47	3rd Phase
TR-235	Tertiary Road	Ward No.-8	Extended	6	20	103.05	3rd Phase
TR-236	Tertiary Road	Ward No.-8	Extended	6	20	258.52	3rd Phase
TR-237	Tertiary Road	Ward No.-8	Extended	6	20	273.98	3rd Phase
TR-238	Tertiary Road	Ward No.-8	Extended	4	20	12.94	3rd Phase
TR-239	Tertiary Road	Ward No.-8	Extended	4	20	31.47	3rd Phase
TR-240	Tertiary Road	Ward No.-8	Extended	4	20	29.56	3rd Phase
TR-241	Tertiary Road	Ward No.-8	Extended	4	20	109.23	3rd Phase
TR-242	Tertiary Road	Ward No.-8	Extended	6	20	48.23	3rd Phase
TR-243	Tertiary Road	Ward No.-8	Extended	4	20	12.98	3rd Phase
TR-244	Tertiary Road	Ward No.-8	Extended	4	20	15.37	3rd Phase
TR-245	Tertiary Road	Ward No.-8	Extended	6	20	34.61	3rd Phase
TR-246	Tertiary Road	Ward No.-8	Extended	4	20	22.38	3rd Phase
TR-247	Tertiary Road	Ward No.-8	Extended	6	20	11.73	3rd Phase
TR-248	Tertiary Road	Ward No.-8	Extended	4	20	136.58	3rd Phase
TR-249	Tertiary Road	Ward No.-7	Extended	8	20	324.91	3rd Phase
TR-250	Tertiary Road	Ward No.-7	Extended	6	20	106.09	3rd Phase
TR-251	Tertiary Road	Ward No.-9	Extended	6	20	54.16	3rd Phase
TR-251	Tertiary Road	Ward No.-8	Extended	6	20	40.02	3rd Phase
TR-252	Tertiary Road	Ward No.-8	Extended	6	20	94.62	3rd Phase
TR-253	Tertiary Road	Ward No.-7	Extended	6	20	134.94	3rd Phase
TR-254	Tertiary Road	Ward No.-8	Extended	4	20	24.65	3rd Phase
TR-255	Tertiary Road	Ward No.-7	Extended	6	20	45.98	3rd Phase
TR-256	Tertiary Road	Ward No.-8	Extended	4	20	14.46	3rd Phase
TR-257	Tertiary Road	Ward No.-1	Extended	6	20	46.55	3rd Phase
TR-258	Tertiary Road	Ward No.-1	Extended	6	20	39.74	3rd Phase
TR-259	Tertiary Road	Ward No.-1	Extended	6	20	5.11	3rd Phase
TR-260	Tertiary Road	Ward No.-1	Extended	6	20	4.95	3rd Phase
TR-261	Tertiary Road	Ward No.-1	Extended	6	20	9.37	3rd Phase
TR-262	Tertiary Road	Ward No.-1	Extended	6	20	19.61	3rd Phase
TR-263	Tertiary Road	Ward No.-1	Extended	6	20	21.14	3rd Phase
TR-264	Tertiary Road	Ward No.-1	Extended	6	20	18.09	3rd Phase
TR-265	Tertiary Road	Ward No.-2	Extended	8	20	79.28	3rd Phase
TR-266	Tertiary Road	Ward No.-9	Extended	6	20	443.33	3rd Phase
TR-267	Tertiary Road	Ward No.-2	Extended	6	20	32.56	3rd Phase

Phase wise Road Network Development proposal of Kalapara Paurashava

Proposed Road ID	Proposed Hierarchy	Ward No	Proposed Type	Existing width (ft)	Proposed width (ft)	Length (m)	Phasing
TR-268	Tertiary Road	Ward No.-5	Extended	6	20	65.42	3rd Phase
TR-269	Tertiary Road	Ward No.-5	Extended	6	20	175.41	3rd Phase
TR-270	Tertiary Road	Ward No.-9	Extended	6	20	5.24	3rd Phase
TR-270	Tertiary Road	Ward No.-8	Extended	6	20	15.48	3rd Phase
TR-271	Tertiary Road	Ward No.-1	Extended	6	20	52.65	3rd Phase
TR-272	Tertiary Road	Ward No.-1	Extended	8	20	21.36	3rd Phase
TR-272	Tertiary Road	Ward No.-3	Extended	8	20	6.13	3rd Phase
TR-273	Tertiary Road	Ward No.-1	Extended	16	20	30.05	3rd Phase
TR-274	Tertiary Road	Ward No.-1	Extended	6	20	2.22	3rd Phase
TR-274	Tertiary Road	Ward No.-3	Extended	6	20	32.33	3rd Phase
TR-275	Tertiary Road	Ward No.-1	Extended	6	20	15.96	3rd Phase
TR-275	Tertiary Road	Ward No.-3	Extended	6	20	12.93	3rd Phase
TR-276	Tertiary Road	Ward No.-4	Extended	6	20	95.35	3rd Phase
TR-277	Tertiary Road	Ward No.-4	Extended	4	20	35.78	3rd Phase
TR-278	Tertiary Road	Ward No.-1	Extended	8	20	62.12	3rd Phase
TR-279	Tertiary Road	Ward No.-1	Extended	6	20	33.80	3rd Phase
TR-280	Tertiary Road	Ward No.-1	Extended	6	20	117.20	3rd Phase
TR-281	Tertiary Road	Ward No.-2	Extended	6	20	71.66	3rd Phase
TR-282	Tertiary Road	Ward No.-9	Extended	6	20	28.78	3rd Phase
TR-283	Tertiary Road	Ward No.-9	Extended	8	20	49.29	3rd Phase
TR-284	Tertiary Road	Ward No.-7	Extended	6	20	43.39	3rd Phase
TR-285	Tertiary Road	Ward No.-7	Extended	6	20	25.56	3rd Phase
TR-286	Tertiary Road	Ward No.-1	Extended	4	20	132.21	3rd Phase
TR-287	Tertiary Road	Ward No.-2	Extended	4	20	14.63	3rd Phase
TR-288	Tertiary Road	Ward No.-3	Extended	6	20	30.80	3rd Phase
TR-289	Tertiary Road	Ward No.-6	Extended	10	20	164.21	3rd Phase
TR-289	Tertiary Road	Ward No.-2	Extended	10	20	146.67	3rd Phase
TR-289	Tertiary Road	Ward No.-1	Extended	10	20	1.04	3rd Phase
TR-290	Tertiary Road	Ward No.-9	New	0	20	135.83	3rd Phase
TR-291	Tertiary Road	Ward No.-9	New	0	20	161.46	3rd Phase
TR-292	Tertiary Road	Ward No.-9	Extended	8	20	53.59	3rd Phase
TR-293	Tertiary Road	Ward No.-9	New	0	20	244.29	3rd Phase
TR-294	Tertiary Road	Ward No.-9	New	0	20	532.33	3rd Phase
TR-295	Tertiary Road	Ward No.-7	New	0	20	16.23	3rd Phase
TR-295	Tertiary Road	Ward No.-5	New	0	20	64.77	3rd Phase
TR-296	Tertiary Road	Ward No.-7	New	0	20	131.43	3rd Phase
TR-297	Tertiary Road	Ward No.-7	New	0	20	178.81	3rd Phase
TR-298	Tertiary Road	Ward No.-7	New	0	20	33.00	3rd Phase
TR-298	Tertiary Road	Ward No.-5	New	0	20	38.65	3rd Phase
TR-299	Tertiary Road	Ward No.-9	New	0	20	161.85	3rd Phase
TR-300	Tertiary Road	Ward No.-7	New	0	20	36.01	3rd Phase
TR-301	Tertiary Road	Ward No.-2	Extended	10	20	25.54	3rd Phase
TR-301	Tertiary Road	Ward No.-4	Extended	10	20	24.20	3rd Phase
TR-302	Tertiary Road	Ward No.-9	New	0	20	80.81	3rd Phase
TR-303	Tertiary Road	Ward No.-7	New	0	20	64.47	3rd Phase
TR-304	Tertiary Road	Ward No.-7	New	0	20	225.40	3rd Phase
TR-305	Tertiary Road	Ward No.-1	New	0	20	516.13	3rd Phase
TR-306	Tertiary Road	Ward No.-1	Extended	6	20	2.04	3rd Phase
TR-307	Tertiary Road	Ward No.-1	Extended	6	20	0.38	3rd Phase
TR-308	Tertiary Road	Ward No.-1	Extended	6	20	119.76	3rd Phase
TR-309	Tertiary Road	Ward No.-1	Extended	6	20	0.55	3rd Phase
TR-310	Tertiary Road	Ward No.-1	New	0	20	271.38	3rd Phase
TR-311	Tertiary Road	Ward No.-8	New	0	20	188.52	3rd Phase
TR-312	Tertiary Road	Ward No.-8	New	0	20	378.95	3rd Phase
TR-313	Tertiary Road	Ward No.-2	Extended	10	20	151.13	3rd Phase
TR-314	Tertiary Road	Ward No.-2	Extended	10	20	152.81	3rd Phase
TR-315	Tertiary Road	Ward No.-2	Extended	10	20	17.24	3rd Phase
TR-316	Tertiary Road	Ward No.-2	Extended	10	20	120.54	3rd Phase
TR-317	Tertiary Road	Ward No.-1	New	0	20	277.04	3rd Phase

Phase wise Road Network Development proposal of Kalapara Paurashava

Proposed Road ID	Proposed Hierarchy	Ward No	Proposed Type	Existing width (ft)	Proposed width (ft)	Length (m)	Phasing
TR-318	Tertiary Road	Ward No.-1	New	0	20	225.73	3rd Phase
TR-319	Tertiary Road	Ward No.-5	New	0	20	195.59	3rd Phase
TR-320	Tertiary Road	Ward No.-1	New	0	20	142.94	3rd Phase
TR-321	Tertiary Road	Ward No.-1	New	0	20	468.84	3rd Phase
TR-322	Tertiary Road	Ward No.-9	New	0	20	308.58	3rd Phase
TR-323	Tertiary Road	Ward No.-9	New	0	20	52.35	3rd Phase
TR-324	Tertiary Road	Ward No.-5	New	0	20	572.83	3rd Phase
TR-325	Tertiary Road	Ward No.-3	New	0	20	527.30	3rd Phase
TR-326	Tertiary Road	Ward No.-8	New	0	20	89.40	3rd Phase
TR-327	Tertiary Road	Ward No.-6	Extended	8	20	0.62	3rd Phase
TR-327	Tertiary Road	Ward No.-7	Extended	8	20	89.62	3rd Phase
TR-328	Tertiary Road	Ward No.-3	Extended	8	20	238.23	3rd Phase
TR-329	Tertiary Road	Ward No.-3	Extended	8	20	231.09	3rd Phase
TR-330	Tertiary Road	Ward No.-3	Extended	8	20	143.01	3rd Phase
TR-331	Tertiary Road	Ward No.-3	Extended	8	20	41.04	3rd Phase
TR-259	Tertiary Road	Ward No.-1	Extended	6	20	41.44	3rd Phase
TR-261	Tertiary Road	Ward No.-1	Extended	6	20	41.44	3rd Phase
TR-260	Tertiary Road	Ward No.-1	Extended	6	20	41.60	3rd Phase
TR-261	Tertiary Road	Ward No.-1	Extended	6	20	41.60	3rd Phase
TR-332	Walkway	Ward No.-9	New	0	6	2909.71	3rd Phase
TR-332	Walkway	Ward No.-7	New	0	6	85.63	3rd Phase
TR-333	Walkway	Ward No.-6	New	0	6	215.97	3rd Phase
TR-333	Walkway	Ward No.-7	New	0	6	506.44	3rd Phase
TR-334	Walkway	Ward No.-4	New	0	6	197.34	3rd Phase
					Total	**63800.05**	

Phase wise Drainage Network Development proposal of Kalapara Paurashava

Proposed Drain ID	Proposed Hierarchy	Proposed Width (ft)	Proposed Depth(m)	Proposed Length(m)	Ward No	Phasing
PD-1	Primary Drain	3.5-4.5	2.25-3.00	472.79	Ward No.-1	1st Phase
PD-1	Primary Drain	3.5-4.5	2.25-3.00	557.71	Ward No.-3	1st Phase
PD-2	Primary Drain	3.5-4.5	2.25-3.00	303.46	Ward No.-8	1st Phase
PD-3	Primary Drain	3.5-4.5	2.25-3.00	320.72	Ward No.-9	1st Phase
PD-3	Primary Drain	3.5-4.5	2.25-3.00	11.75	Ward No.-8	1st Phase
SD-1	Secondary Drain	2.5-3.5	1.25-2.25	438.07	Ward No.-1	1st Phase
SD-10	Secondary Drain	2.5-3.5	1.25-2.25	2.81	Ward No.-7	1st Phase
SD-10	Secondary Drain	2.5-3.5	1.25-2.25	172.61	Ward No.-5	1st Phase
SD-11	Secondary Drain	2.5-3.5	1.25-2.25	271.38	Ward No.-1	1st Phase
SD-12	Secondary Drain	2.5-3.5	1.25-2.25	604.86	Ward No.-1	1st Phase
SD-13	Secondary Drain	2.5-3.5	1.25-2.25	160.21	Ward No.-1	1st Phase
SD-14	Secondary Drain	2.5-3.5	1.25-2.25	104.27	Ward No.-1	1st Phase
SD-15	Secondary Drain	2.5-3.5	1.25-2.25	117.60	Ward No.-1	1st Phase
SD-16	Secondary Drain	2.5-3.5	1.25-2.25	285.39	Ward No.-1	1st Phase
SD-17	Secondary Drain	2.5-3.5	1.25-2.25	74.75	Ward No.-1	1st Phase
SD-17	Secondary Drain	2.5-3.5	1.25-2.25	14.42	Ward No.-3	1st Phase
SD-18	Secondary Drain	2.5-3.5	1.25-2.25	373.40	Ward No.-1	1st Phase
SD-19	Secondary Drain	2.5-3.5	1.25-2.25	278.82	Ward No.-3	1st Phase
SD-2	Secondary Drain	2.5-3.5	1.25-2.25	631.34	Ward No.-9	1st Phase
SD-2	Secondary Drain	2.5-3.5	1.25-2.25	495.34	Ward No.-8	1st Phase
SD-2	Secondary Drain	2.5-3.5	1.25-2.25	260.38	Ward No.-6	1st Phase
SD-20	Secondary Drain	2.5-3.5	1.25-2.25	416.81	Ward No.-3	1st Phase
SD-21	Secondary Drain	2.5-3.5	1.25-2.25	164.18	Ward No.-5	1st Phase
SD-22	Secondary Drain	2.5-3.5	1.25-2.25	261.83	Ward No.-8	1st Phase
SD-23	Secondary Drain	2.5-3.5	1.25-2.25	188.52	Ward No.-8	1st Phase
SD-24	Secondary Drain	2.5-3.5	1.25-2.25	71.59	Ward No.-8	1st Phase
SD-25	Secondary Drain	2.5-3.5	1.25-2.25	6.65	Ward No.-8	1st Phase
SD-25	Secondary Drain	2.5-3.5	1.25-2.25	140.04	Ward No.-7	1st Phase
SD-26	Secondary Drain	2.5-3.5	1.25-2.25	317.69	Ward No.-6	1st Phase
SD-27	Secondary Drain	2.5-3.5	1.25-2.25	453.23	Ward No.-9	1st Phase
SD-27	Secondary Drain	2.5-3.5	1.25-2.25	203.15	Ward No.-8	1st Phase
SD-28	Secondary Drain	2.5-3.5	1.25-2.25	1.50	Ward No.-7	1st Phase
SD-29	Secondary Drain	2.5-3.5	1.25-2.25	129.35	Ward No.-7	1st Phase
SD-3	Secondary Drain	2.5-3.5	1.25-2.25	572.10	Ward No.-1	1st Phase
SD-30	Secondary Drain	2.5-3.5	1.25-2.25	25.34	Ward No.-7	1st Phase
SD-31	Secondary Drain	2.5-3.5	1.25-2.25	19.98	Ward No.-7	1st Phase
SD-32	Secondary Drain	2.5-3.5	1.25-2.25	180.63	Ward No.-9	1st Phase
SD-33	Secondary Drain	2.5-3.5	1.25-2.25	393.07	Ward No.-9	1st Phase
SD-34	Secondary Drain	2.5-3.5	1.25-2.25	234.55	Ward No.-9	1st Phase
SD-35	Secondary Drain	2.5-3.5	1.25-2.25	0.64	Ward No.-4	1st Phase
SD-36	Secondary Drain	2.5-3.5	1.25-2.25	0.13	Ward No.-4	1st Phase
SD-37	Secondary Drain	2.5-3.5	1.25-2.25	1.72	Ward No.-3	1st Phase
SD-38	Secondary Drain	2.5-3.5	1.25-2.25	137.72	Ward No.-3	1st Phase
SD-39	Secondary Drain	2.5-3.5	1.25-2.25	114.75	Ward No.-3	1st Phase
SD-4	Secondary Drain	2.5-3.5	1.25-2.25	305.30	Ward No.-3	1st Phase
SD-40	Secondary Drain	2.5-3.5	1.25-2.25	137.82	Ward No.-4	1st Phase
SD-40	Secondary Drain	2.5-3.5	1.25-2.25	83.32	Ward No.-3	1st Phase
SD-41	Secondary Drain	2.5-3.5	1.25-2.25	197.62	Ward No.-4	1st Phase
SD-42	Secondary Drain	2.5-3.5	1.25-2.25	0.09	Ward No.-6	2nd Phase
SD-43	Secondary Drain	2.5-3.5	1.25-2.25	97.16	Ward No.-6	2nd Phase
SD-44	Secondary Drain	2.5-3.5	1.25-2.25	43.11	Ward No.-6	2nd Phase
SD-45	Secondary Drain	2.5-3.5	1.25-2.25	175.44	Ward No.-6	2nd Phase
SD-46	Secondary Drain	2.5-3.5	1.25-2.25	2.77	Ward No.-8	2nd Phase
SD-46	Secondary Drain	2.5-3.5	1.25-2.25	119.26	Ward No.-7	2nd Phase
SD-46	Secondary Drain	2.5-3.5	1.25-2.25	0.07	Ward No.-8	2nd Phase
SD-46	Secondary Drain	2.5-3.5	1.25-2.25	0.07	Ward No.-6	2nd Phase
SD-47	Secondary Drain	2.5-3.5	1.25-2.25	143.31	Ward No.-8	2nd Phase
SD-48	Secondary Drain	2.5-3.5	1.25-2.25	222.88	Ward No.-8	2nd Phase
SD-48	Secondary Drain	2.5-3.5	1.25-2.25	3.95	Ward No.-6	2nd Phase
SD-49	Secondary Drain	2.5-3.5	1.25-2.25	176.41	Ward No.-9	2nd Phase
SD-49	Secondary Drain	2.5-3.5	1.25-2.25	123.72	Ward No.-8	2nd Phase
SD-5	Secondary Drain	2.5-3.5	1.25-2.25	50.96	Ward No.-9	1st Phase

Phase wise Drainage Network Development proposal of Kalapara Paurashava

Proposed Drain ID	Proposed Hierarchy	Proposed Width (ft)	Proposed Depth(m)	Proposed Length(m)	Ward No	Phasing
SD-5	Secondary Drain	2.5-3.5	1.25-2.25	39.25	Ward No.-7	1st Phase
SD-50	Secondary Drain	2.5-3.5	1.25-2.25	208.42	Ward No.-4	2nd Phase
SD-51	Secondary Drain	2.5-3.5	1.25-2.25	0.07	Ward No.-7	2nd Phase
SD-51	Secondary Drain	2.5-3.5	1.25-2.25	181.73	Ward No.-4	2nd Phase
SD-52	Secondary Drain	2.5-3.5	1.25-2.25	82.05	Ward No.-4	2nd Phase
SD-52	Secondary Drain	2.5-3.5	1.25-2.25	32.56	Ward No.-3	2nd Phase
SD-53	Secondary Drain	2.5-3.5	1.25-2.25	353.55	Ward No.-4	2nd Phase
SD-53	Secondary Drain	2.5-3.5	1.25-2.25	104.55	Ward No.-3	2nd Phase
SD-54	Secondary Drain	2.5-3.5	1.25-2.25	456.38	Ward No.-9	2nd Phase
SD-55	Secondary Drain	2.5-3.5	1.25-2.25	20.94	Ward No.-2	2nd Phase
SD-56	Secondary Drain	2.5-3.5	1.25-2.25	260.87	Ward No.-2	2nd Phase
SD-56	Secondary Drain	2.5-3.5	1.25-2.25	356.16	Ward No.-1	2nd Phase
SD-57	Secondary Drain	2.5-3.5	1.25-2.25	298.84	Ward No.-2	2nd Phase
SD-58	Secondary Drain	2.5-3.5	1.25-2.25	161.40	Ward No.-9	2nd Phase
SD-6	Secondary Drain	2.5-3.5	1.25-2.25	335.72	Ward No.-1	1st Phase
SD-7	Secondary Drain	2.5-3.5	1.25-2.25	215.56	Ward No.-5	1st Phase
SD-7	Secondary Drain	2.5-3.5	1.25-2.25	188.80	Ward No.-3	1st Phase
SD-8	Secondary Drain	2.5-3.5	1.25-2.25	573.58	Ward No.-2	1st Phase
SD-8	Secondary Drain	2.5-3.5	1.25-2.25	362.86	Ward No.-1	1st Phase
SD-9	Secondary Drain	2.5-3.5	1.25-2.25	7.04	Ward No.-4	1st Phase
SD-9	Secondary Drain	2.5-3.5	1.25-2.25	816.25	Ward No.-5	1st Phase
TD-1	Tertiary Drain	2-2.5	.64-1.25	679.86	Ward No.-1	2nd Phase
TD-1	Tertiary Drain	2-2.5	.64-1.25	14.00	Ward No.-3	2nd Phase
TD-10	Tertiary Drain	2-2.5	.64-1.25	127.36	Ward No.-1	2nd Phase
TD-10	Tertiary Drain	2-2.5	.64-1.25	19.62	Ward No.-3	2nd Phase
TD-100	Tertiary Drain	2-2.5	.64-1.25	25.58	Ward No.-3	2nd Phase
TD-101	Tertiary Drain	2-2.5	.64-1.25	113.38	Ward No.-4	2nd Phase
TD-102	Tertiary Drain	2-2.5	.64-1.25	75.54	Ward No.-4	2nd Phase
TD-103	Tertiary Drain	2-2.5	.64-1.25	251.03	Ward No.-4	2nd Phase
TD-103	Tertiary Drain	2-2.5	.64-1.25	6.88	Ward No.-3	2nd Phase
TD-104	Tertiary Drain	2-2.5	.64-1.25	59.73	Ward No.-4	2nd Phase
TD-105	Tertiary Drain	2-2.5	.64-1.25	82.39	Ward No.-4	2nd Phase
TD-106	Tertiary Drain	2-2.5	.64-1.25	220.09	Ward No.-4	2nd Phase
TD-107	Tertiary Drain	2-2.5	.64-1.25	127.44	Ward No.-4	2nd Phase
TD-108	Tertiary Drain	2-2.5	.64-1.25	126.77	Ward No.-4	2nd Phase
TD-109	Tertiary Drain	2-2.5	.64-1.25	214.51	Ward No.-5	2nd Phase
TD-11	Tertiary Drain	2-2.5	.64-1.25	386.02	Ward No.-1	2nd Phase
TD-110	Tertiary Drain	2-2.5	.64-1.25	7.04	Ward No.-4	2nd Phase
TD-110	Tertiary Drain	2-2.5	.64-1.25	395.58	Ward No.-5	2nd Phase
TD-111	Tertiary Drain	2-2.5	.64-1.25	82.93	Ward No.-5	2nd Phase
TD-112	Tertiary Drain	2-2.5	.64-1.25	37.18	Ward No.-4	2nd Phase
TD-113	Tertiary Drain	2-2.5	.64-1.25	56.08	Ward No.-4	2nd Phase
TD-114	Tertiary Drain	2-2.5	.64-1.25	22.44	Ward No.-4	2nd Phase
TD-115	Tertiary Drain	2-2.5	.64-1.25	0.05	Ward No.-4	2nd Phase
TD-115	Tertiary Drain	2-2.5	.64-1.25	74.89	Ward No.-3	2nd Phase
TD-116	Tertiary Drain	2-2.5	.64-1.25	46.99	Ward No.-3	2nd Phase
TD-117	Tertiary Drain	2-2.5	.64-1.25	163.01	Ward No.-3	2nd Phase
TD-118	Tertiary Drain	2-2.5	.64-1.25	13.86	Ward No.-3	2nd Phase
TD-119	Tertiary Drain	2-2.5	.64-1.25	14.99	Ward No.-3	2nd Phase
TD-12	Tertiary Drain	2-2.5	.64-1.25	188.41	Ward No.-1	2nd Phase
TD-120	Tertiary Drain	2-2.5	.64-1.25	71.87	Ward No.-3	2nd Phase
TD-121	Tertiary Drain	2-2.5	.64-1.25	422.81	Ward No.-9	2nd Phase
TD-121	Tertiary Drain	2-2.5	.64-1.25	45.54	Ward No.-8	2nd Phase
TD-122	Tertiary Drain	2-2.5	.64-1.25	176.32	Ward No.-9	2nd Phase
TD-123	Tertiary Drain	2-2.5	.64-1.25	103.21	Ward No.-9	2nd Phase
TD-124	Tertiary Drain	2-2.5	.64-1.25	96.35	Ward No.-9	2nd Phase
TD-125	Tertiary Drain	2-2.5	.64-1.25	65.82	Ward No.-9	2nd Phase
TD-126	Tertiary Drain	2-2.5	.64-1.25	357.96	Ward No.-9	2nd Phase
TD-127	Tertiary Drain	2-2.5	.64-1.25	26.68	Ward No.-9	2nd Phase
TD-128	Tertiary Drain	2-2.5	.64-1.25	246.15	Ward No.-9	2nd Phase
TD-129	Tertiary Drain	2-2.5	.64-1.25	51.86	Ward No.-9	2nd Phase
TD-13	Tertiary Drain	2-2.5	.64-1.25	290.12	Ward No.-1	2nd Phase

Phase wise Drainage Network Development proposal of Kalapara Paurashava

Proposed Drain ID	Proposed Hierarchy	Proposed Width (ft)	Proposed Depth(m)	Proposed Length(m)	Ward No	Phasing
TD-130	Tertiary Drain	2-2.5	.64-1.25	77.72	Ward No.-9	2nd Phase
TD-131	Tertiary Drain	2-2.5	.64-1.25	71.20	Ward No.-9	2nd Phase
TD-132	Tertiary Drain	2-2.5	.64-1.25	36.14	Ward No.-9	2nd Phase
TD-133	Tertiary Drain	2-2.5	.64-1.25	250.26	Ward No.-9	2nd Phase
TD-134	Tertiary Drain	2-2.5	.64-1.25	187.12	Ward No.-9	2nd Phase
TD-135	Tertiary Drain	2-2.5	.64-1.25	54.51	Ward No.-9	2nd Phase
TD-136	Tertiary Drain	2-2.5	.64-1.25	75.47	Ward No.-9	2nd Phase
TD-137	Tertiary Drain	2-2.5	.64-1.25	135.75	Ward No.-9	2nd Phase
TD-138	Tertiary Drain	2-2.5	.64-1.25	149.68	Ward No.-9	2nd Phase
TD-139	Tertiary Drain	2-2.5	.64-1.25	92.74	Ward No.-9	2nd Phase
TD-14	Tertiary Drain	2-2.5	.64-1.25	157.21	Ward No.-1	2nd Phase
TD-140	Tertiary Drain	2-2.5	.64-1.25	25.04	Ward No.-9	2nd Phase
TD-141	Tertiary Drain	2-2.5	.64-1.25	170.04	Ward No.-9	2nd Phase
TD-142	Tertiary Drain	2-2.5	.64-1.25	17.42	Ward No.-9	2nd Phase
TD-143	Tertiary Drain	2-2.5	.64-1.25	342.35	Ward No.-9	2nd Phase
TD-144	Tertiary Drain	2-2.5	.64-1.25	29.76	Ward No.-9	2nd Phase
TD-145	Tertiary Drain	2-2.5	.64-1.25	47.43	Ward No.-9	2nd Phase
TD-146	Tertiary Drain	2-2.5	.64-1.25	201.55	Ward No.-9	2nd Phase
TD-147	Tertiary Drain	2-2.5	.64-1.25	140.27	Ward No.-9	2nd Phase
TD-148	Tertiary Drain	2-2.5	.64-1.25	128.16	Ward No.-9	2nd Phase
TD-149	Tertiary Drain	2-2.5	.64-1.25	211.46	Ward No.-9	2nd Phase
TD-15	Tertiary Drain	2-2.5	.64-1.25	173.18	Ward No.-1	2nd Phase
TD-150	Tertiary Drain	2-2.5	.64-1.25	64.15	Ward No.-9	2nd Phase
TD-151	Tertiary Drain	2-2.5	.64-1.25	18.17	Ward No.-9	3rd Phase
TD-152	Tertiary Drain	2-2.5	.64-1.25	65.49	Ward No.-9	3rd Phase
TD-153	Tertiary Drain	2-2.5	.64-1.25	142.80	Ward No.-9	3rd Phase
TD-154	Tertiary Drain	2-2.5	.64-1.25	49.11	Ward No.-9	3rd Phase
TD-155	Tertiary Drain	2-2.5	.64-1.25	35.31	Ward No.-9	3rd Phase
TD-156	Tertiary Drain	2-2.5	.64-1.25	77.71	Ward No.-9	3rd Phase
TD-157	Tertiary Drain	2-2.5	.64-1.25	257.97	Ward No.-9	3rd Phase
TD-157	Tertiary Drain	2-2.5	.64-1.25	2.44	Ward No.-8	3rd Phase
TD-157	Tertiary Drain	2-2.5	.64-1.25	122.79	Ward No.-7	3rd Phase
TD-158	Tertiary Drain	2-2.5	.64-1.25	54.57	Ward No.-9	3rd Phase
TD-158	Tertiary Drain	2-2.5	.64-1.25	282.86	Ward No.-8	3rd Phase
TD-159	Tertiary Drain	2-2.5	.64-1.25	142.88	Ward No.-8	3rd Phase
TD-16	Tertiary Drain	2-2.5	.64-1.25	104.94	Ward No.-1	2nd Phase
TD-160	Tertiary Drain	2-2.5	.64-1.25	143.04	Ward No.-8	3rd Phase
TD-161	Tertiary Drain	2-2.5	.64-1.25	76.76	Ward No.-8	3rd Phase
TD-162	Tertiary Drain	2-2.5	.64-1.25	6.00	Ward No.-8	3rd Phase
TD-162	Tertiary Drain	2-2.5	.64-1.25	35.26	Ward No.-7	3rd Phase
TD-163	Tertiary Drain	2-2.5	.64-1.25	246.10	Ward No.-8	3rd Phase
TD-164	Tertiary Drain	2-2.5	.64-1.25	72.04	Ward No.-8	3rd Phase
TD-165	Tertiary Drain	2-2.5	.64-1.25	328.23	Ward No.-8	3rd Phase
TD-166	Tertiary Drain	2-2.5	.64-1.25	61.20	Ward No.-9	3rd Phase
TD-167	Tertiary Drain	2-2.5	.64-1.25	38.62	Ward No.-8	3rd Phase
TD-168	Tertiary Drain	2-2.5	.64-1.25	92.80	Ward No.-8	3rd Phase
TD-169	Tertiary Drain	2-2.5	.64-1.25	248.38	Ward No.-8	3rd Phase
TD-17	Tertiary Drain	2-2.5	.64-1.25	365.26	Ward No.-1	2nd Phase
TD-170	Tertiary Drain	2-2.5	.64-1.25	109.23	Ward No.-8	3rd Phase
TD-171	Tertiary Drain	2-2.5	.64-1.25	48.23	Ward No.-8	3rd Phase
TD-172	Tertiary Drain	2-2.5	.64-1.25	136.58	Ward No.-8	3rd Phase
TD-173	Tertiary Drain	2-2.5	.64-1.25	6.20	Ward No.-8	3rd Phase
TD-173	Tertiary Drain	2-2.5	.64-1.25	321.30	Ward No.-7	3rd Phase
TD-174	Tertiary Drain	2-2.5	.64-1.25	107.95	Ward No.-7	3rd Phase
TD-175	Tertiary Drain	2-2.5	.64-1.25	52.80	Ward No.-9	3rd Phase
TD-175	Tertiary Drain	2-2.5	.64-1.25	41.38	Ward No.-8	3rd Phase
TD-176	Tertiary Drain	2-2.5	.64-1.25	5.97	Ward No.-8	3rd Phase
TD-176	Tertiary Drain	2-2.5	.64-1.25	42.57	Ward No.-7	3rd Phase
TD-177	Tertiary Drain	2-2.5	.64-1.25	46.55	Ward No.-1	3rd Phase
TD-178	Tertiary Drain	2-2.5	.64-1.25	227.58	Ward No.-9	3rd Phase
TD-179	Tertiary Drain	2-2.5	.64-1.25	231.09	Ward No.-3	3rd Phase
TD-18	Tertiary Drain	2-2.5	.64-1.25	113.40	Ward No.-3	2nd Phase

Phase wise Drainage Network Development proposal of Kalapara Paurashava

Proposed Drain ID	Proposed Hierarchy	Proposed Width (ft)	Proposed Depth(m)	Proposed Length(m)	Ward No	Phasing
TD-180	Tertiary Drain	2-2.5	.64-1.25	177.92	Ward No.-3	3rd Phase
TD-181	Tertiary Drain	2-2.5	.64-1.25	32.56	Ward No.-2	3rd Phase
TD-182	Tertiary Drain	2-2.5	.64-1.25	30.21	Ward No.-8	3rd Phase
TD-183	Tertiary Drain	2-2.5	.64-1.25	62.16	Ward No.-5	3rd Phase
TD-184	Tertiary Drain	2-2.5	.64-1.25	31.01	Ward No.-8	3rd Phase
TD-185	Tertiary Drain	2-2.5	.64-1.25	52.65	Ward No.-1	3rd Phase
TD-186	Tertiary Drain	2-2.5	.64-1.25	299.51	Ward No.-1	3rd Phase
TD-187	Tertiary Drain	2-2.5	.64-1.25	18.48	Ward No.-3	3rd Phase
TD-188	Tertiary Drain	2-2.5	.64-1.25	20.56	Ward No.-1	3rd Phase
TD-188	Tertiary Drain	2-2.5	.64-1.25	8.33	Ward No.-3	3rd Phase
TD-189	Tertiary Drain	2-2.5	.64-1.25	95.35	Ward No.-4	3rd Phase
TD-19	Tertiary Drain	2-2.5	.64-1.25	146.77	Ward No.-3	2nd Phase
TD-190	Tertiary Drain	2-2.5	.64-1.25	35.78	Ward No.-4	3rd Phase
TD-191	Tertiary Drain	2-2.5	.64-1.25	72.04	Ward No.-1	3rd Phase
TD-192	Tertiary Drain	2-2.5	.64-1.25	71.66	Ward No.-2	3rd Phase
TD-193	Tertiary Drain	2-2.5	.64-1.25	54.85	Ward No.-9	3rd Phase
TD-194	Tertiary Drain	2-2.5	.64-1.25	1.51	Ward No.-8	3rd Phase
TD-194	Tertiary Drain	2-2.5	.64-1.25	41.88	Ward No.-7	3rd Phase
TD-195	Tertiary Drain	2-2.5	.64-1.25	132.21	Ward No.-1	3rd Phase
TD-196	Tertiary Drain	2-2.5	.64-1.25	30.80	Ward No.-3	3rd Phase
TD-197	Tertiary Drain	2-2.5	.64-1.25	169.93	Ward No.-6	3rd Phase
TD-197	Tertiary Drain	2-2.5	.64-1.25	0.01	Ward No.-2	3rd Phase
TD-197	Tertiary Drain	2-2.5	.64-1.25	147.70	Ward No.-1	3rd Phase
TD-198	Tertiary Drain	2-2.5	.64-1.25	146.21	Ward No.-9	3rd Phase
TD-199	Tertiary Drain	2-2.5	.64-1.25	53.59	Ward No.-9	3rd Phase
TD-2	Tertiary Drain	2-2.5	.64-1.25	117.01	Ward No.-1	2nd Phase
TD-20	Tertiary Drain	2-2.5	.64-1.25	52.16	Ward No.-3	2nd Phase
TD-200	Tertiary Drain	2-2.5	.64-1.25	244.29	Ward No.-9	3rd Phase
TD-201	Tertiary Drain	2-2.5	.64-1.25	531.51	Ward No.-9	3rd Phase
TD-202	Tertiary Drain	2-2.5	.64-1.25	19.93	Ward No.-7	3rd Phase
TD-202	Tertiary Drain	2-2.5	.64-1.25	29.89	Ward No.-5	3rd Phase
TD-203	Tertiary Drain	2-2.5	.64-1.25	163.01	Ward No.-7	3rd Phase
TD-204	Tertiary Drain	2-2.5	.64-1.25	36.80	Ward No.-5	3rd Phase
TD-205	Tertiary Drain	2-2.5	.64-1.25	159.45	Ward No.-9	3rd Phase
TD-206	Tertiary Drain	2-2.5	.64-1.25	36.01	Ward No.-7	3rd Phase
TD-207	Tertiary Drain	2-2.5	.64-1.25	17.50	Ward No.-2	3rd Phase
TD-208	Tertiary Drain	2-2.5	.64-1.25	73.58	Ward No.-9	3rd Phase
TD-209	Tertiary Drain	2-2.5	.64-1.25	64.47	Ward No.-7	3rd Phase
TD-21	Tertiary Drain	2-2.5	.64-1.25	33.89	Ward No.-3	2nd Phase
TD-210	Tertiary Drain	2-2.5	.64-1.25	225.40	Ward No.-7	3rd Phase
TD-211	Tertiary Drain	2-2.5	.64-1.25	293.54	Ward No.-1	3rd Phase
TD-212	Tertiary Drain	2-2.5	.64-1.25	432.91	Ward No.-1	3rd Phase
TD-213	Tertiary Drain	2-2.5	.64-1.25	0.38	Ward No.-1	3rd Phase
TD-214	Tertiary Drain	2-2.5	.64-1.25	119.76	Ward No.-1	3rd Phase
TD-215	Tertiary Drain	2-2.5	.64-1.25	168.12	Ward No.-8	3rd Phase
TD-216	Tertiary Drain	2-2.5	.64-1.25	95.00	Ward No.-3	3rd Phase
TD-217	Tertiary Drain	2-2.5	.64-1.25	151.13	Ward No.-2	3rd Phase
TD-218	Tertiary Drain	2-2.5	.64-1.25	152.81	Ward No.-2	3rd Phase
TD-219	Tertiary Drain	2-2.5	.64-1.25	17.24	Ward No.-2	3rd Phase
TD-22	Tertiary Drain	2-2.5	.64-1.25	73.58	Ward No.-3	2nd Phase
TD-220	Tertiary Drain	2-2.5	.64-1.25	120.54	Ward No.-2	3rd Phase
TD-221	Tertiary Drain	2-2.5	.64-1.25	146.35	Ward No.-1	3rd Phase
TD-222	Tertiary Drain	2-2.5	.64-1.25	239.68	Ward No.-1	3rd Phase
TD-223	Tertiary Drain	2-2.5	.64-1.25	197.29	Ward No.-5	3rd Phase
TD-224	Tertiary Drain	2-2.5	.64-1.25	216.81	Ward No.-6	3rd Phase
TD-224	Tertiary Drain	2-2.5	.64-1.25	505.59	Ward No.-7	3rd Phase
TD-225	Tertiary Drain	2-2.5	.64-1.25	142.94	Ward No.-1	3rd Phase
TD-226	Tertiary Drain	2-2.5	.64-1.25	467.64	Ward No.-1	3rd Phase
TD-227	Tertiary Drain	2-2.5	.64-1.25	314.13	Ward No.-1	3rd Phase
TD-228	Tertiary Drain	2-2.5	.64-1.25	304.17	Ward No.-9	3rd Phase
TD-229	Tertiary Drain	2-2.5	.64-1.25	52.35	Ward No.-9	3rd Phase
TD-23	Tertiary Drain	2-2.5	.64-1.25	105.61	Ward No.-3	2nd Phase

Phase wise Drainage Network Development proposal of Kalapara Paurashava

Proposed Drain ID	Proposed Hierarchy	Proposed Width (ft)	Proposed Depth(m)	Proposed Length(m)	Ward No	Phasing
TD-230	Tertiary Drain	2-2.5	.64-1.25	205.09	Ward No.-4	3rd Phase
TD-231	Tertiary Drain	2-2.5	.64-1.25	461.80	Ward No.-5	3rd Phase
TD-232	Tertiary Drain	2-2.5	.64-1.25	319.74	Ward No.-3	3rd Phase
TD-233	Tertiary Drain	2-2.5	.64-1.25	7.70	Ward No.-6	3rd Phase
TD-233	Tertiary Drain	2-2.5	.64-1.25	84.04	Ward No.-7	3rd Phase
TD-234	Tertiary Drain	2-2.5	.64-1.25	238.23	Ward No.-3	3rd Phase
TD-235	Tertiary Drain	2-2.5	.64-1.25	166.42	Ward No.-3	3rd Phase
TD-236	Tertiary Drain	2-2.5	.64-1.25	250.53	Ward No.-1	3rd Phase
TD-237	Tertiary Drain	2-2.5	.64-1.25	372.52	Ward No.-1	3rd Phase
TD-238	Tertiary Drain	2-2.5	.64-1.25	6.63	Ward No.-6	3rd Phase
TD-238	Tertiary Drain	2-2.5	.64-1.25	101.11	Ward No.-2	3rd Phase
TD-239	Tertiary Drain	2-2.5	.64-1.25	22.09	Ward No.-7	3rd Phase
TD-24	Tertiary Drain	2-2.5	.64-1.25	17.29	Ward No.-3	2nd Phase
TD-240	Tertiary Drain	2-2.5	.64-1.25	114.29	Ward No.-7	3rd Phase
TD-241	Tertiary Drain	2-2.5	.64-1.25	112.17	Ward No.-1	3rd Phase
TD-242	Tertiary Drain	2-2.5	.64-1.25	57.86	Ward No.-1	3rd Phase
TD-243	Tertiary Drain	2-2.5	.64-1.25	88.21	Ward No.-1	3rd Phase
TD-244	Tertiary Drain	2-2.5	.64-1.25	152.48	Ward No.-1	3rd Phase
TD-245	Tertiary Drain	2-2.5	.64-1.25	237.06	Ward No.-1	3rd Phase
TD-246	Tertiary Drain	2-2.5	.64-1.25	181.47	Ward No.-1	3rd Phase
TD-247	Tertiary Drain	2-2.5	.64-1.25	2.65	Ward No.-8	3rd Phase
TD-247	Tertiary Drain	2-2.5	.64-1.25	239.03	Ward No.-7	3rd Phase
TD-248	Tertiary Drain	2-2.5	.64-1.25	226.33	Ward No.-8	3rd Phase
TD-249	Tertiary Drain	2-2.5	.64-1.25	62.55	Ward No.-6	3rd Phase
TD-25	Tertiary Drain	2-2.5	.64-1.25	133.34	Ward No.-1	2nd Phase
TD-25	Tertiary Drain	2-2.5	.64-1.25	70.22	Ward No.-3	2nd Phase
TD-250	Tertiary Drain	2-2.5	.64-1.25	0.59	Ward No.-4	3rd Phase
TD-251	Tertiary Drain	2-2.5	.64-1.25	1.53	Ward No.-4	3rd Phase
TD-252	Tertiary Drain	2-2.5	.64-1.25	74.79	Ward No.-6	3rd Phase
TD-253	Tertiary Drain	2-2.5	.64-1.25	0.06	Ward No.-9	3rd Phase
TD-254	Tertiary Drain	2-2.5	.64-1.25	0.67	Ward No.-9	3rd Phase
TD-255	Tertiary Drain	2-2.5	.64-1.25	378.93	Ward No.-9	3rd Phase
TD-256	Tertiary Drain	2-2.5	.64-1.25	116.35	Ward No.-9	3rd Phase
TD-257	Tertiary Drain	2-2.5	.64-1.25	343.69	Ward No.-9	3rd Phase
TD-258	Tertiary Drain	2-2.5	.64-1.25	263.77	Ward No.-9	3rd Phase
TD-259	Tertiary Drain	2-2.5	.64-1.25	423.61	Ward No.-9	3rd Phase
TD-26	Tertiary Drain	2-2.5	.64-1.25	244.02	Ward No.-1	2nd Phase
TD-260	Tertiary Drain	2-2.5	.64-1.25	554.74	Ward No.-9	3rd Phase
TD-261	Tertiary Drain	2-2.5	.64-1.25	0.74	Ward No.-5	3rd Phase
TD-262	Tertiary Drain	2-2.5	.64-1.25	22.71	Ward No.-7	3rd Phase
TD-263	Tertiary Drain	2-2.5	.64-1.25	37.72	Ward No.-7	3rd Phase
TD-264	Tertiary Drain	2-2.5	.64-1.25	217.45	Ward No.-5	3rd Phase
TD-265	Tertiary Drain	2-2.5	.64-1.25	0.16	Ward No.-5	3rd Phase
TD-266	Tertiary Drain	2-2.5	.64-1.25	0.53	Ward No.-5	3rd Phase
TD-267	Tertiary Drain	2-2.5	.64-1.25	7.27	Ward No.-5	3rd Phase
TD-268	Tertiary Drain	2-2.5	.64-1.25	73.01	Ward No.-5	3rd Phase
TD-269	Tertiary Drain	2-2.5	.64-1.25	88.63	Ward No.-5	3rd Phase
TD-27	Tertiary Drain	2-2.5	.64-1.25	3.64	Ward No.-2	2nd Phase
TD-27	Tertiary Drain	2-2.5	.64-1.25	368.52	Ward No.-1	2nd Phase
TD-270	Tertiary Drain	2-2.5	.64-1.25	134.70	Ward No.-5	3rd Phase
TD-271	Tertiary Drain	2-2.5	.64-1.25	52.89	Ward No.-5	3rd Phase
TD-272	Tertiary Drain	2-2.5	.64-1.25	44.63	Ward No.-5	3rd Phase
TD-273	Tertiary Drain	2-2.5	.64-1.25	212.58	Ward No.-5	3rd Phase
TD-274	Tertiary Drain	2-2.5	.64-1.25	114.07	Ward No.-5	3rd Phase
TD-275	Tertiary Drain	2-2.5	.64-1.25	54.82	Ward No.-1	3rd Phase
TD-276	Tertiary Drain	2-2.5	.64-1.25	41.37	Ward No.-3	3rd Phase
TD-277	Tertiary Drain	2-2.5	.64-1.25	203.69	Ward No.-3	3rd Phase
TD-278	Tertiary Drain	2-2.5	.64-1.25	56.86	Ward No.-1	3rd Phase
TD-279	Tertiary Drain	2-2.5	.64-1.25	56.60	Ward No.-3	3rd Phase
TD-28	Tertiary Drain	2-2.5	.64-1.25	29.72	Ward No.-2	2nd Phase
TD-280	Tertiary Drain	2-2.5	.64-1.25	89.17	Ward No.-8	3rd Phase
TD-281	Tertiary Drain	2-2.5	.64-1.25	0.23	Ward No.-8	3rd Phase

Phase wise Drainage Network Development proposal of Kalapara Paurashava

Proposed Drain ID	Proposed Hierarchy	Proposed Width (ft)	Proposed Depth(m)	Proposed Length(m)	Ward No	Phasing
TD-282	Tertiary Drain	2-2.5	.64-1.25	160.40	Ward No.-8	3rd Phase
TD-282	Tertiary Drain	2-2.5	.64-1.25	4.12	Ward No.-6	3rd Phase
TD-283	Tertiary Drain	2-2.5	.64-1.25	248.01	Ward No.-8	3rd Phase
TD-284	Tertiary Drain	2-2.5	.64-1.25	89.58	Ward No.-9	3rd Phase
TD-285	Tertiary Drain	2-2.5	.64-1.25	35.19	Ward No.-9	3rd Phase
TD-286	Tertiary Drain	2-2.5	.64-1.25	101.77	Ward No.-9	3rd Phase
TD-287	Tertiary Drain	2-2.5	.64-1.25	133.98	Ward No.-9	3rd Phase
TD-287	Tertiary Drain	2-2.5	.64-1.25	46.27	Ward No.-8	3rd Phase
TD-288	Tertiary Drain	2-2.5	.64-1.25	3.10	Ward No.-9	3rd Phase
TD-289	Tertiary Drain	2-2.5	.64-1.25	27.42	Ward No.-9	3rd Phase
TD-29	Tertiary Drain	2-2.5	.64-1.25	1.43	Ward No.-2	2nd Phase
TD-29	Tertiary Drain	2-2.5	.64-1.25	43.60	Ward No.-4	2nd Phase
TD-290	Tertiary Drain	2-2.5	.64-1.25	58.86	Ward No.-9	3rd Phase
TD-291	Tertiary Drain	2-2.5	.64-1.25	78.82	Ward No.-9	3rd Phase
TD-292	Tertiary Drain	2-2.5	.64-1.25	173.26	Ward No.-9	3rd Phase
TD-293	Tertiary Drain	2-2.5	.64-1.25	81.06	Ward No.-9	3rd Phase
TD-294	Tertiary Drain	2-2.5	.64-1.25	230.15	Ward No.-9	3rd Phase
TD-295	Tertiary Drain	2-2.5	.64-1.25	144.68	Ward No.-9	3rd Phase
TD-296	Tertiary Drain	2-2.5	.64-1.25	5.99	Ward No.-9	3rd Phase
TD-297	Tertiary Drain	2-2.5	.64-1.25	0.18	Ward No.-9	3rd Phase
TD-298	Tertiary Drain	2-2.5	.64-1.25	418.38	Ward No.-9	3rd Phase
TD-299	Tertiary Drain	2-2.5	.64-1.25	200.85	Ward No.-9	3rd Phase
TD-3	Tertiary Drain	2-2.5	.64-1.25	35.04	Ward No.-1	2nd Phase
TD-30	Tertiary Drain	2-2.5	.64-1.25	91.39	Ward No.-1	2nd Phase
TD-300	Tertiary Drain	2-2.5	.64-1.25	397.20	Ward No.-9	3rd Phase
TD-31	Tertiary Drain	2-2.5	.64-1.25	40.72	Ward No.-1	2nd Phase
TD-32	Tertiary Drain	2-2.5	.64-1.25	114.98	Ward No.-1	2nd Phase
TD-33	Tertiary Drain	2-2.5	.64-1.25	152.65	Ward No.-1	2nd Phase
TD-34	Tertiary Drain	2-2.5	.64-1.25	6.54	Ward No.-6	2nd Phase
TD-34	Tertiary Drain	2-2.5	.64-1.25	505.10	Ward No.-2	2nd Phase
TD-34	Tertiary Drain	2-2.5	.64-1.25	8.88	Ward No.-1	2nd Phase
TD-35	Tertiary Drain	2-2.5	.64-1.25	8.83	Ward No.-2	2nd Phase
TD-36	Tertiary Drain	2-2.5	.64-1.25	47.27	Ward No.-2	2nd Phase
TD-37	Tertiary Drain	2-2.5	.64-1.25	112.31	Ward No.-2	2nd Phase
TD-38	Tertiary Drain	2-2.5	.64-1.25	73.53	Ward No.-2	2nd Phase
TD-39	Tertiary Drain	2-2.5	.64-1.25	57.17	Ward No.-2	2nd Phase
TD-4	Tertiary Drain	2-2.5	.64-1.25	441.21	Ward No.-1	2nd Phase
TD-4	Tertiary Drain	2-2.5	.64-1.25	21.69	Ward No.-3	2nd Phase
TD-40	Tertiary Drain	2-2.5	.64-1.25	55.74	Ward No.-2	2nd Phase
TD-41	Tertiary Drain	2-2.5	.64-1.25	11.46	Ward No.-2	2nd Phase
TD-42	Tertiary Drain	2-2.5	.64-1.25	11.36	Ward No.-2	2nd Phase
TD-43	Tertiary Drain	2-2.5	.64-1.25	23.59	Ward No.-2	2nd Phase
TD-44	Tertiary Drain	2-2.5	.64-1.25	83.49	Ward No.-2	2nd Phase
TD-45	Tertiary Drain	2-2.5	.64-1.25	176.08	Ward No.-2	2nd Phase
TD-46	Tertiary Drain	2-2.5	.64-1.25	13.75	Ward No.-2	2nd Phase
TD-47	Tertiary Drain	2-2.5	.64-1.25	96.98	Ward No.-2	2nd Phase
TD-48	Tertiary Drain	2-2.5	.64-1.25	62.53	Ward No.-2	2nd Phase
TD-49	Tertiary Drain	2-2.5	.64-1.25	69.08	Ward No.-2	2nd Phase
TD-5	Tertiary Drain	2-2.5	.64-1.25	49.55	Ward No.-1	2nd Phase
TD-50	Tertiary Drain	2-2.5	.64-1.25	83.20	Ward No.-2	2nd Phase
TD-51	Tertiary Drain	2-2.5	.64-1.25	35.22	Ward No.-2	2nd Phase
TD-52	Tertiary Drain	2-2.5	.64-1.25	26.38	Ward No.-2	2nd Phase
TD-53	Tertiary Drain	2-2.5	.64-1.25	60.47	Ward No.-2	2nd Phase
TD-54	Tertiary Drain	2-2.5	.64-1.25	98.52	Ward No.-2	2nd Phase
TD-55	Tertiary Drain	2-2.5	.64-1.25	131.39	Ward No.-2	2nd Phase
TD-56	Tertiary Drain	2-2.5	.64-1.25	12.95	Ward No.-2	2nd Phase
TD-57	Tertiary Drain	2-2.5	.64-1.25	270.44	Ward No.-3	2nd Phase
TD-58	Tertiary Drain	2-2.5	.64-1.25	35.06	Ward No.-2	2nd Phase
TD-59	Tertiary Drain	2-2.5	.64-1.25	29.98	Ward No.-2	2nd Phase
TD-6	Tertiary Drain	2-2.5	.64-1.25	156.47	Ward No.-1	2nd Phase
TD-60	Tertiary Drain	2-2.5	.64-1.25	38.18	Ward No.-2	2nd Phase
TD-61	Tertiary Drain	2-2.5	.64-1.25	37.26	Ward No.-2	2nd Phase

Phase wise Drainage Network Development proposal of Kalapara Paurashava

Proposed Drain ID	Proposed Hierarchy	Proposed Width (ft)	Proposed Depth(m)	Proposed Length(m)	Ward No	Phasing
TD-62	Tertiary Drain	2-2.5	.64-1.25	55.21	Ward No.-6	2nd Phase
TD-63	Tertiary Drain	2-2.5	.64-1.25	86.80	Ward No.-8	2nd Phase
TD-64	Tertiary Drain	2-2.5	.64-1.25	203.07	Ward No.-8	2nd Phase
TD-65	Tertiary Drain	2-2.5	.64-1.25	152.21	Ward No.-8	2nd Phase
TD-66	Tertiary Drain	2-2.5	.64-1.25	7.93	Ward No.-8	2nd Phase
TD-66	Tertiary Drain	2-2.5	.64-1.25	88.88	Ward No.-7	2nd Phase
TD-67	Tertiary Drain	2-2.5	.64-1.25	45.55	Ward No.-7	2nd Phase
TD-68	Tertiary Drain	2-2.5	.64-1.25	263.83	Ward No.-7	2nd Phase
TD-69	Tertiary Drain	2-2.5	.64-1.25	467.16	Ward No.-7	2nd Phase
TD-7	Tertiary Drain	2-2.5	.64-1.25	106.81	Ward No.-1	2nd Phase
TD-70	Tertiary Drain	2-2.5	.64-1.25	55.42	Ward No.-7	2nd Phase
TD-71	Tertiary Drain	2-2.5	.64-1.25	79.14	Ward No.-7	2nd Phase
TD-72	Tertiary Drain	2-2.5	.64-1.25	126.07	Ward No.-8	2nd Phase
TD-73	Tertiary Drain	2-2.5	.64-1.25	50.19	Ward No.-8	2nd Phase
TD-73	Tertiary Drain	2-2.5	.64-1.25	4.10	Ward No.-6	2nd Phase
TD-74	Tertiary Drain	2-2.5	.64-1.25	152.77	Ward No.-8	2nd Phase
TD-75	Tertiary Drain	2-2.5	.64-1.25	51.54	Ward No.-8	2nd Phase
TD-76	Tertiary Drain	2-2.5	.64-1.25	268.40	Ward No.-6	2nd Phase
TD-77	Tertiary Drain	2-2.5	.64-1.25	169.65	Ward No.-6	2nd Phase
TD-78	Tertiary Drain	2-2.5	.64-1.25	170.59	Ward No.-6	2nd Phase
TD-79	Tertiary Drain	2-2.5	.64-1.25	92.35	Ward No.-7	2nd Phase
TD-8	Tertiary Drain	2-2.5	.64-1.25	9.25	Ward No.-1	2nd Phase
TD-80	Tertiary Drain	2-2.5	.64-1.25	216.68	Ward No.-7	2nd Phase
TD-81	Tertiary Drain	2-2.5	.64-1.25	39.75	Ward No.-7	2nd Phase
TD-82	Tertiary Drain	2-2.5	.64-1.25	776.10	Ward No.-7	2nd Phase
TD-83	Tertiary Drain	2-2.5	.64-1.25	27.41	Ward No.-7	2nd Phase
TD-84	Tertiary Drain	2-2.5	.64-1.25	61.16	Ward No.-7	2nd Phase
TD-85	Tertiary Drain	2-2.5	.64-1.25	67.92	Ward No.-7	2nd Phase
TD-86	Tertiary Drain	2-2.5	.64-1.25	90.52	Ward No.-6	2nd Phase
TD-87	Tertiary Drain	2-2.5	.64-1.25	52.80	Ward No.-2	2nd Phase
TD-88	Tertiary Drain	2-2.5	.64-1.25	48.72	Ward No.-2	2nd Phase
TD-89	Tertiary Drain	2-2.5	.64-1.25	248.29	Ward No.-6	2nd Phase
TD-9	Tertiary Drain	2-2.5	.64-1.25	55.14	Ward No.-1	2nd Phase
TD-9	Tertiary Drain	2-2.5	.64-1.25	19.80	Ward No.-3	2nd Phase
TD-90	Tertiary Drain	2-2.5	.64-1.25	60.44	Ward No.-6	2nd Phase
TD-91	Tertiary Drain	2-2.5	.64-1.25	98.86	Ward No.-2	2nd Phase
TD-92	Tertiary Drain	2-2.5	.64-1.25	136.02	Ward No.-6	2nd Phase
TD-93	Tertiary Drain	2-2.5	.64-1.25	77.07	Ward No.-6	2nd Phase
TD-94	Tertiary Drain	2-2.5	.64-1.25	0.13	Ward No.-7	2nd Phase
TD-94	Tertiary Drain	2-2.5	.64-1.25	92.05	Ward No.-5	2nd Phase
TD-95	Tertiary Drain	2-2.5	.64-1.25	48.26	Ward No.-5	2nd Phase
TD-96	Tertiary Drain	2-2.5	.64-1.25	50.86	Ward No.-5	2nd Phase
TD-97	Tertiary Drain	2-2.5	.64-1.25	172.57	Ward No.-4	2nd Phase
TD-97	Tertiary Drain	2-2.5	.64-1.25	20.82	Ward No.-3	2nd Phase
TD-98	Tertiary Drain	2-2.5	.64-1.25	319.39	Ward No.-3	2nd Phase
TD-99	Tertiary Drain	2-2.5	.64-1.25	122.07	Ward No.-4	2nd Phase
TD-99	Tertiary Drain	2-2.5	.64-1.25	42.86	Ward No.-3	2nd Phase

Table G1: Planning Schedule of Waterbodies in Kalapara Paurashava

Landuse	Ward No.	Mouza	JL	Sheet	Plot No.	Area (Acre)
Waterbody	1	Khepupara	6	1	164	0.166
Waterbody	1	Khepupara	6	1	163	0.133
Waterbody	1	Khepupara	6	1	177	0.063
Waterbody	1	Khepupara	6	1	163	0.063
Waterbody	1	Khepupara	6	1	177	0.027
Waterbody	1	Khepupara	6	1	163	0.027
Waterbody	1	Khepupara	6	1	160	0.104
Waterbody	1	Khepupara	6	1	162	0.096
Waterbody	1	Khepupara	6	1	177	0.096
Waterbody	1	Khepupara	6	1	161	0.096
Waterbody	1	Khepupara	6	1	160	0.096
Waterbody	1	Khepupara	6	1	159	0.038
Waterbody	1	Khepupara	6	1	160	0.038
Waterbody	1	Khepupara	6	1	145	0.046
Waterbody	1	Khepupara	6	1	145	0.051
Waterbody	1	Khepupara	6	1	219	0.142
Waterbody	1	Khepupara	6	1	219	0.209
Waterbody	1	Khepupara	6	1	235	0.107
Waterbody	1	Khepupara	6	1	236	0.110
Waterbody	1	Khepupara	6	1	236	0.058
Waterbody	1	Khepupara	6	1	236	0.192
Waterbody	1	Khepupara	6	1	236	0.053
Waterbody	1	Khepupara	6	1	240	0.199
Waterbody	1	Khepupara	6	1	240	0.563
Waterbody	1	Khepupara	6	1	240	0.423
Waterbody	1	Khepupara	6	1	251	0.385
Waterbody	1	Khepupara	6	1	245	0.331
Waterbody	1	Khepupara	6	1	243	0.331
Waterbody	1	Khepupara	6	1	245	0.575
Waterbody	1	Khepupara	6	1	244	0.476
Waterbody	1	Khepupara	6	1	185	0.476
Waterbody	1	Khepupara	6	1	219	0.052
Waterbody	1	Khepupara	6	1	213	0.052
Waterbody	1	Khepupara	6	1	219	0.060
Waterbody	1	Khepupara	6	1	213	0.060
Waterbody	1	Khepupara	6	1	217	1.212
Waterbody	1	Khepupara	6	1	216	1.212
Waterbody	1	Khepupara	6	1	213	1.212
Waterbody	1	Khepupara	6	1	216	1.155
Waterbody	1	Khepupara	6	1	215	1.155
Waterbody	1	Khepupara	6	1	214	1.155
Waterbody	1	Khepupara	6	1	213	1.155
Waterbody	1	Khepupara	6	1	235	0.064
Waterbody	1	Khepupara	6	1	164	0.055
Waterbody	1	Khepupara	6	1	177	0.095
Waterbody	1	Khepupara	6	1	164	0.095
Waterbody	1	Khepupara	6	1	192	0.031
Waterbody	1	Khepupara	6	1	208	0.054
Waterbody	1	Khepupara	6	1	192	2.933
Waterbody	1	Khepupara	6	1	146	0.074
Waterbody	1	Khepupara	6	1	146	0.075
Waterbody	1	Khepupara	6	1	146	0.046
Waterbody	1	Khepupara	6	1	146	0.086
Waterbody	1	Khepupara	6	1	146	0.049
Waterbody	1	Khepupara	6	1	146	0.051
Waterbody	1	Khepupara	6	1	146	0.066
Waterbody	1	Khepupara	6	3	602	0.061
Waterbody	1	Khepupara	6	1	254	0.061
Waterbody	1	Khepupara	6	3	612	0.809
Waterbody	1	Khepupara	6	3	617	1.246
Waterbody	1	Khepupara	6	3	618	1.246
Waterbody	1	Khepupara	6	3	612	1.246
Waterbody	1	Khepupara	6	2	339	0.153
Waterbody	1	Khepupara	6	2	1153	0.153
Waterbody	1	Khepupara	6	1	146	0.153
Waterbody	1	Khepupara	6	2	1153	0.052

Landuse	Ward No.	Mouza	JL	Sheet	Plot No.	Area (Acre)
Waterbody	1	Khepupara	6	1	146	0.052
Waterbody	1	Khepupara	6	1	146	0.063
Waterbody	1	Khepupara	6	1	280	0.041
Waterbody	1	Khepupara	6	1	279	0.041
Waterbody	1	Khepupara	6	1	269	0.042
Waterbody	1	Khepupara	6	1	279	0.042
Waterbody	1	Khepupara	6	1	146	0.042
Waterbody	1	Khepupara	6	1	270	0.047
Waterbody	1	Khepupara	6	1	146	0.047
Waterbody	1	Khepupara	6	1	279	0.082
Waterbody	1	Khepupara	6	1	146	0.082
Waterbody	1	Khepupara	6	1	267	0.128
Waterbody	1	Khepupara	6	1	178	0.128
Waterbody	1	Khepupara	6	1	146	0.128
Waterbody	1	Khepupara	6	1	178	0.227
Waterbody	1	Khepupara	6	1	278	0.227
Waterbody	1	Khepupara	6	1	159	0.227
Waterbody	1	Khepupara	6	1	277	0.227
Waterbody	1	Khepupara	6	1	146	0.227
Waterbody	1	Khepupara	6	2	1153	0.049
Waterbody	1	Khepupara	6	1	146	0.049
Waterbody	1	Khepupara	6	3	715	7.291
Waterbody	1	Khepupara	6	3	721	7.291
Waterbody	1	Khepupara	6	3	764	7.291
Waterbody	1	Khepupara	6	3	894	7.291
Waterbody	1	Khepupara	6	3	892	7.291
Waterbody	1	Khepupara	6	3	746	7.291
Waterbody	1	Khepupara	6	3	747	7.291
Waterbody	1	Khepupara	6	3	1081	7.291
Waterbody	1	Khepupara	6	3	728	7.291
Waterbody	1	Khepupara	6	3	800	7.291
Waterbody	1	Khepupara	6	3	643	7.291
Waterbody	1	Khepupara	6	3	611	7.291
Waterbody	1	Khepupara	6	3	812	7.291
Waterbody	1	Khepupara	6	3	606	7.291
Waterbody	1	Khepupara	6	3	1078	7.291
Waterbody	1	Khepupara	6	3	888	7.291
Waterbody	1	Khepupara	6	3	866	7.291
Waterbody	1	Khepupara	6	2	487	7.291
Waterbody	1	Khepupara	6	3	607	7.291
Waterbody	1	Khepupara	6	3	609	7.291
Waterbody	1	Khepupara	6	3	852	7.291
Waterbody	1	Khepupara	6	3	850	7.291
Waterbody	1	Khepupara	6	3	851	7.291
Waterbody	1	Khepupara	6	3	849	7.291
Waterbody	1	Khepupara	6	3	608	7.291
Waterbody	1	Khepupara	6	3	1059	7.291
Waterbody	1	Khepupara	6	2	474	7.291
Waterbody	1	Khepupara	6	2	465	7.291
Waterbody	1	Khepupara	6	2	371	7.291
Waterbody	1	Khepupara	6	2	370	7.291
Waterbody	1	Khepupara	6	2	472	7.291
Waterbody	1	Khepupara	6	3	1012	7.291
Waterbody	1	Khepupara	6	3	1013	7.291
Waterbody	1	Khepupara	6	2	467	7.291
Waterbody	1	Khepupara	6	2	599	7.291
Waterbody	1	Khepupara	6	2	488	7.291
Waterbody	1	Khepupara	6	3	602	7.291
Waterbody	1	Khepupara	6	2	446	7.291
Waterbody	1	Khepupara	6	2	423	7.291
Waterbody	1	Khepupara	6	2	593	7.291
Waterbody	1	Khepupara	6	2	424	7.291
Waterbody	1	Khepupara	6	3	842	7.291
Waterbody	1	Khepupara	6	2	443	7.291
Waterbody	1	Khepupara	6	2	366	7.291
Waterbody	1	Khepupara	6	2	427	7.291
Waterbody	1	Khepupara	6	2	346	7.291
Waterbody	1	Khepupara	6	2	425	7.291
Waterbody	1	Khepupara	6	2	365	7.291

Landuse	Ward No.	Mouza	JL	Sheet	Plot No.	Area (Acre)
Waterbody	1	Khepupara	6	2	421	7.291
Waterbody	1	Khepupara	6	2	351	7.291
Waterbody	1	Khepupara	6	1	254	7.291
Waterbody	1	Khepupara	6	2	430	7.291
Waterbody	1	Khepupara	6	2	352	7.291
Waterbody	1	Khepupara	6	2	418	7.291
Waterbody	1	Khepupara	6	2	353	7.291
Waterbody	1	Khepupara	6	2	354	7.291
Waterbody	1	Khepupara	6	2	355	7.291
Waterbody	1	Khepupara	6	2	364	7.291
Waterbody	1	Khepupara	6	2	357	7.291
Waterbody	1	Khepupara	6	2	360	7.291
Waterbody	1	Khepupara	6	1	208	0.298
Waterbody	1	Khepupara	6	1	191	0.920
Waterbody	1	Khepupara	6	1	174	0.920
Waterbody	1	Khepupara	6	1	175	0.920
Waterbody	1	Khepupara	6	1	192	0.920
Waterbody	1	Khepupara	6	1	173	0.920
Waterbody	1	Khepupara	6	1	176	0.920
Waterbody	1	Khepupara	6	1	185	0.920
Waterbody	1	Khepupara	6	1	181	0.920
Waterbody	1	Khepupara	6	1	182	0.920
Waterbody	1	Khepupara	6	1	180	0.920
Waterbody	1	Khepupara	6	1	285	0.920
Waterbody	1	Khepupara	6	1	179	0.920
Waterbody	1	Khepupara	6	1	177	0.920
Waterbody	1	Khepupara	6	1	172	0.920
Waterbody	1	Khepupara	6	1	168	0.920
Waterbody	1	Khepupara	6	1	179	0.473
Waterbody	1	Khepupara	6	1	177	0.473
Waterbody	1	Khepupara	6	1	167	0.473
Waterbody	1	Khepupara	6	1	304	0.473
Waterbody	1	Khepupara	6	1	168	0.473
Waterbody	1	Khepupara	6	1	171	3.048
Waterbody	1	Khepupara	6	1	160	3.048
Waterbody	1	Khepupara	6	1	172	3.048
Waterbody	1	Khepupara	6	1	170	3.048
Waterbody	1	Khepupara	6	1	169	3.048
Waterbody	1	Khepupara	6	1	163	3.048
Waterbody	1	Khepupara	6	1	276	3.048
Waterbody	1	Khepupara	6	1	164	3.048
Waterbody	1	Khepupara	6	1	156	3.048
Waterbody	1	Khepupara	6	1	157	3.048
Waterbody	1	Khepupara	6	1	155	3.048
Waterbody	1	Khepupara	6	1	146	3.048
Waterbody	1	Khepupara	6	1	154	3.048
Waterbody	1	Khepupara	6	1	282	3.048
Waterbody	1	Khepupara	6	1	240	0.080
Waterbody	1	Khepupara	6	1	236	0.094
Waterbody	1	Khepupara	6	1	240	0.046
Waterbody	1	Khepupara	6	1	235	0.052
Waterbody	1	Khepupara	6	1	236	0.046
Waterbody	1	Khepupara	6	1	192	0.042
Waterbody	1	Khepupara	6	1	236	0.071
Waterbody	1	Khepupara	6	1	189	0.071
Waterbody	1	Khepupara	6	1	292	0.071
Waterbody	1	Khepupara	6	1	192	0.069
Waterbody	1	Khepupara	6	1	177	0.061
Waterbody	1	Khepupara	6	1	164	0.061
Waterbody	1	Khepupara	6	1	172	0.054
Waterbody	1	Khepupara	6	1	172	0.436
Waterbody	1	Khepupara	6	2	338	0.011
Waterbody	1	Khepupara	6	2	337	0.011
Waterbody	1	Khepupara	6	1	146	0.011
Waterbody	1	Khepupara	6	1	164	0.051
Waterbody	1	Khepupara	6	2	338	0.207
Waterbody	1	Khepupara	6	2	337	0.207
Waterbody	1	Khepupara	6	1	146	0.207
Waterbody	1	Khepupara	6	1	164	0.030

Landuse	Ward No.	Mouza	JL	Sheet	Plot No.	Area (Acre)
Waterbody	1	Khepupara	6	2	338	0.058
Waterbody	1	Khepupara	6	2	337	0.058
Waterbody	1	Khepupara	6	2	337	0.049
Waterbody	1	Khepupara	6	2	337	0.020
Waterbody	1	Khepupara	6	2	338	0.061
Waterbody	1	Khepupara	6	2	337	0.061
Waterbody	1	Khepupara	6	2	336	0.063
Waterbody	1	Khepupara	6	2	337	0.063
Waterbody	1	Khepupara	6	2	335	0.063
Waterbody	1	Khepupara	6	1	143	0.063
Waterbody	1	Khepupara	6	1	110	0.063
Waterbody	1	Khepupara	6	1	145	0.103
Waterbody	1	Khepupara	6	1	143	0.103
Waterbody	1	Khepupara	6	1	110	0.103
Waterbody	1	Khepupara	6	1	145	0.040
Waterbody	1	Khepupara	6	1	145	0.049
Waterbody	1	Khepupara	6	1	136	0.137
Waterbody	1	Khepupara	6	1	136	0.112
Waterbody	1	Khepupara	6	1	136	0.112
Waterbody	1	Khepupara	6	1	255	0.068
Waterbody	1	Khepupara	6	1	138	0.068
Waterbody	1	Khepupara	6	1	137	0.085
Waterbody	1	Khepupara	6	1	143	0.218
Waterbody	1	Khepupara	6	1	185	2.913
Waterbody	1	Khepupara	6	1	185	0.069
Waterbody	1	Khepupara	6	3	603	0.395
Waterbody	1	Khepupara	6	3	604	0.395
Waterbody	1	Khepupara	6	3	602	0.395
Waterbody	1	Khepupara	6	1	210	0.002
Waterbody	1	Khepupara	6	1	213	0.002
Waterbody	1	Khepupara	6	1	208	0.002
Waterbody	1	Khepupara	6	1	238	0.058
Waterbody	1	Khepupara	6	1	238	0.063
Waterbody	1	Khepupara	6	1	238	0.027
Waterbody	1	Khepupara	6	1	238	0.057
Waterbody	1	Khepupara	6	1	243	0.016
Waterbody	1	Khepupara	6	1	251	0.002
Waterbody	1	Khepupara	6	1	244	0.000
Waterbody	1	Khepupara	6	1	185	0.000
Waterbody	1	Khepupara	6	1	219	0.000
Waterbody	1	Khepupara	6	1	192	0.001
Waterbody	1	Khepupara	6	1	172	0.047
Waterbody	1	Khepupara	6	2	337	0.000
Waterbody	1	Khepupara	6	1	169	0.032
Waterbody	1	Khepupara	6	1	169	0.032
Waterbody	1	Khepupara	6	1	143	0.049
Waterbody	1	Khepupara	6	1	157	1.491
Waterbody	1	Khepupara	6	1	148	1.491
Waterbody	1	Khepupara	6	1	155	1.491
Waterbody	1	Khepupara	6	1	146	1.491
Waterbody	1	Khepupara	6	1	282	1.491
Waterbody	1	Khepupara	6	1	147	1.491
Waterbody	1	Khepupara	6	1	149	1.491
Waterbody	1	Khepupara	6	1	137	1.491
Waterbody	1	Khepupara	6	1	155	0.357
Waterbody	1	Khepupara	6	1	154	0.357
Waterbody	1	Khepupara	6	1	153	0.357
Waterbody	1	Khepupara	6	1	282	0.357
Waterbody	1	Khepupara	6	1	149	0.357
Waterbody	1	Khepupara	6	1	282	0.025
Waterbody	1	Khepupara	6	1	149	0.025
Waterbody	1	Khepupara	6	1	155	0.092
Waterbody	1	Khepupara	6	1	282	0.092
Waterbody	2	Khepupara	6	3	652	0.655
Waterbody	2	Khepupara	6	3	650	0.655
Waterbody	2	Khepupara	6	3	651	0.655
Waterbody	2	Khepupara	6	3	648	0.655
Waterbody	2	Khepupara	6	3	649	0.655
Waterbody	2	Khepupara	6	3	647	0.655

Landuse	Ward No.	Mouza	JL	Sheet	Plot No.	Area (Acre)
Waterbody	2	Khepupara	6	3	1051	0.655
Waterbody	2	Khepupara	6	3	644	0.655
Waterbody	2	Khepupara	6	3	655	0.414
Waterbody	2	Khepupara	6	3	633	0.414
Waterbody	2	Khepupara	6	3	632	0.414
Waterbody	2	Khepupara	6	3	645	0.063
Waterbody	2	Khepupara	6	3	646	0.063
Waterbody	2	Khepupara	6	3	640	0.263
Waterbody	2	Khepupara	6	3	641	0.263
Waterbody	2	Khepupara	6	3	639	0.263
Waterbody	2	Khepupara	6	3	612	0.263
Waterbody	2	Khepupara	6	3	612	0.419
Waterbody	2	Khepupara	6	3	610	0.051
Waterbody	2	Khepupara	6	3	609	0.051
Waterbody	2	Khepupara	6	3	610	0.209
Waterbody	2	Khepupara	6	3	609	0.209
Waterbody	2	Khepupara	6	3	644	1.151
Waterbody	2	Khepupara	6	3	654	0.211
Waterbody	2	Khepupara	6	3	612	0.066
Waterbody	2	Khepupara	6	3	711	0.000
Waterbody	2	Khepupara	6	3	712	0.000
Waterbody	2	Khepupara	6	3	713	0.000
Waterbody	2	Khepupara	6	3	721	0.000
Waterbody	2	Khepupara	6	3	640	0.290
Waterbody	2	Khepupara	6	3	639	0.290
Waterbody	2	Khepupara	6	3	638	0.290
Waterbody	3	Khepupara	6	2	362	0.114
Waterbody	3	Khepupara	6	2	364	0.019
Waterbody	3	Khepupara	6	2	421	0.063
Waterbody	3	Khepupara	6	2	421	0.018
Waterbody	3	Khepupara	6	2	421	0.049
Waterbody	3	Khepupara	6	2	421	0.043
Waterbody	3	Khepupara	6	2	421	0.032
Waterbody	3	Khepupara	6	2	421	0.055
Waterbody	3	Khepupara	6	2	421	0.013
Waterbody	3	Khepupara	6	2	378	0.042
Waterbody	3	Khepupara	6	2	390	0.097
Waterbody	3	Khepupara	6	2	390	0.060
Waterbody	3	Khepupara	6	2	396	0.108
Waterbody	3	Khepupara	6	2	397	0.162
Waterbody	3	Khepupara	6	2	396	0.162
Waterbody	3	Khepupara	6	2	409	0.162
Waterbody	3	Khepupara	6	2	410	0.042
Waterbody	3	Khepupara	6	2	410	0.004
Waterbody	3	Khepupara	6	2	409	0.004
Waterbody	3	Khepupara	6	2	408	0.036
Waterbody	3	Khepupara	6	2	421	0.034
Waterbody	3	Khepupara	6	2	421	0.138
Waterbody	3	Khepupara	6	2	421	0.041
Waterbody	3	Khepupara	6	2	420	0.473
Waterbody	3	Khepupara	6	2	412	0.473
Waterbody	3	Khepupara	6	2	414	0.006
Waterbody	3	Khepupara	6	2	414	0.019
Waterbody	3	Khepupara	6	2	401	0.157
Waterbody	3	Khepupara	6	2	401	0.254
Waterbody	3	Khepupara	6	2	401	0.202
Waterbody	3	Khepupara	6	2	401	0.086
Waterbody	3	Khepupara	6	2	364	0.032
Waterbody	3	Khepupara	6	2	407	0.180
Waterbody	3	Khepupara	6	2	401	0.180
Waterbody	3	Khepupara	6	2	408	0.135
Waterbody	3	Khepupara	6	2	401	0.056
Waterbody	3	Khepupara	6	2	364	0.061
Waterbody	3	Khepupara	6	2	364	0.032
Waterbody	3	Khepupara	6	2	364	0.096
Waterbody	3	Khepupara	6	2	395	0.082
Waterbody	3	Khepupara	6	2	395	0.053
Waterbody	3	Khepupara	6	2	395	0.033
Waterbody	3	Khepupara	6	2	392	0.070

Landuse	Ward No.	Mouza	JL	Sheet	Plot No.	Area (Acre)
Waterbody	3	Khepupara	6	2	391	0.045
Waterbody	3	Khepupara	6	2	392	0.045
Waterbody	3	Khepupara	6	2	392	0.050
Waterbody	3	Khepupara	6	2	384	0.061
Waterbody	3	Khepupara	6	2	345	0.033
Waterbody	3	Khepupara	6	2	344	0.004
Waterbody	3	Khepupara	6	2	344	0.039
Waterbody	3	Khepupara	6	2	383	0.029
Waterbody	3	Khepupara	6	2	380	0.130
Waterbody	3	Khepupara	6	2	379	0.043
Waterbody	3	Khepupara	6	2	425	0.471
Waterbody	3	Khepupara	6	2	421	0.471
Waterbody	3	Khepupara	6	2	420	0.471
Waterbody	3	Khepupara	6	2	413	0.471
Waterbody	3	Khepupara	6	2	419	0.471
Waterbody	3	Khepupara	6	2	357	0.064
Waterbody	3	Khepupara	6	2	357	0.120
Waterbody	3	Khepupara	6	2	357	0.080
Waterbody	3	Khepupara	6	2	358	0.087
Waterbody	3	Khepupara	6	2	358	0.090
Waterbody	3	Khepupara	6	2	358	0.087
Waterbody	3	Khepupara	6	2	354	0.055
Waterbody	3	Khepupara	6	2	355	0.055
Waterbody	3	Khepupara	6	2	351	0.033
Waterbody	3	Khepupara	6	2	351	0.047
Waterbody	3	Khepupara	6	2	347	0.072
Waterbody	3	Khepupara	6	2	358	0.173
Waterbody	3	Khepupara	6	2	360	0.173
Waterbody	3	Khepupara	6	2	362	0.173
Waterbody	3	Khepupara	6	2	419	0.456
Waterbody	3	Khepupara	6	2	402	0.456
Waterbody	3	Khepupara	6	2	403	0.456
Waterbody	3	Khepupara	6	2	404	0.456
Waterbody	3	Khepupara	6	2	405	0.456
Waterbody	3	Khepupara	6	2	395	0.043
Waterbody	3	Khepupara	6	2	413	0.092
Waterbody	3	Khepupara	6	2	419	0.092
Waterbody	3	Khepupara	6	2	346	0.001
Waterbody	3	Khepupara	6	2	360	0.001
Waterbody	3	Khepupara	6	2	346	0.001
Waterbody	3	Khepupara	6	2	351	0.001
Waterbody	4	Khepupara	6	3	852	0.312
Waterbody	4	Khepupara	6	3	850	0.312
Waterbody	4	Khepupara	6	3	818	0.144
Waterbody	4	Khepupara	6	3	817	0.144
Waterbody	4	Khepupara	6	3	818	0.109
Waterbody	4	Khepupara	6	3	833	0.508
Waterbody	4	Khepupara	6	3	831	0.165
Waterbody	4	Khepupara	6	3	845	0.165
Waterbody	4	Khepupara	6	3	831	0.080
Waterbody	4	Khepupara	6	3	848	0.080
Waterbody	4	Khepupara	6	3	845	0.080
Waterbody	4	Khepupara	6	3	842	0.124
Waterbody	4	Khepupara	6	3	842	0.019
Waterbody	4	Khepupara	6	3	838	0.123
Waterbody	4	Khepupara	6	3	817	0.063
Waterbody	4	Khepupara	6	3	817	0.113
Waterbody	4	Khepupara	6	3	817	0.080
Waterbody	4	Khepupara	6	2	378	0.246
Waterbody	4	Khepupara	6	3	815	0.246
Waterbody	4	Khepupara	6	3	815	0.048
Waterbody	4	Khepupara	6	3	816	0.048
Waterbody	4	Khepupara	6	3	817	0.048
Waterbody	4	Khepupara	6	3	834	0.048
Waterbody	4	Khepupara	6	3	842	0.048
Waterbody	4	Khepupara	6	3	837	0.122
Waterbody	4	Khepupara	6	3	842	0.122
Waterbody	4	Khepupara	6	3	836	0.065
Waterbody	4	Khepupara	6	3	837	0.065

Landuse	Ward No.	Mouza	JL	Sheet	Plot No.	Area (Acre)
Waterbody	4	Khepupara	6	3	842	0.000
Waterbody	4	Khepupara	6	3	842	0.057
Waterbody	4	Khepupara	6	2	389	0.541
Waterbody	4	Khepupara	6	2	396	0.541
Waterbody	4	Khepupara	6	3	842	0.541
Waterbody	5	Khepupara	6	2	592	0.404
Waterbody	5	Khepupara	6	2	592	0.140
Waterbody	5	Khepupara	6	2	592	0.091
Waterbody	5	Khepupara	6	2	592	0.045
Waterbody	5	Khepupara	6	2	503	0.028
Waterbody	5	Khepupara	6	2	477	0.171
Waterbody	5	Khepupara	6	2	475	0.171
Waterbody	5	Khepupara	6	2	461	0.171
Waterbody	5	Khepupara	6	2	506	0.171
Waterbody	5	Khepupara	6	2	461	0.053
Waterbody	5	Khepupara	6	2	506	0.053
Waterbody	5	Khepupara	6	2	503	0.031
Waterbody	5	Khepupara	6	2	482	0.203
Waterbody	5	Khepupara	6	2	481	0.203
Waterbody	5	Khepupara	6	2	483	0.203
Waterbody	5	Khepupara	6	2	484	0.034
Waterbody	5	Khepupara	6	2	484	0.051
Waterbody	5	Khepupara	6	2	484	0.030
Waterbody	5	Khepupara	6	2	442	0.082
Waterbody	5	Khepupara	6	2	447	0.129
Waterbody	5	Khepupara	6	2	442	0.129
Waterbody	5	Khepupara	6	2	452	0.221
Waterbody	5	Khepupara	6	2	440	0.221
Waterbody	5	Khepupara	6	2	467	0.046
Waterbody	5	Khepupara	6	2	460	0.158
Waterbody	5	Khepupara	6	2	459	0.271
Waterbody	5	Khepupara	6	2	458	0.271
Waterbody	5	Khepupara	6	2	457	0.044
Waterbody	5	Khepupara	6	2	454	0.031
Waterbody	5	Khepupara	6	2	456	0.079
Waterbody	5	Khepupara	6	2	457	0.079
Waterbody	5	Khepupara	6	2	455	0.039
Waterbody	5	Khepupara	6	2	455	0.026
Waterbody	5	Khepupara	6	2	520	0.026
Waterbody	5	Khepupara	6	2	440	0.085
Waterbody	5	Khepupara	6	2	442	0.041
Waterbody	5	Khepupara	6	2	442	0.034
Waterbody	5	Khepupara	6	2	442	0.119
Waterbody	5	Khepupara	6	2	442	0.275
Waterbody	5	Khepupara	6	2	444	0.237
Waterbody	5	Khepupara	6	2	429	0.033
Waterbody	5	Khepupara	6	2	430	0.036
Waterbody	5	Khepupara	6	2	418	0.036
Waterbody	5	Khepupara	6	2	432	0.036
Waterbody	5	Khepupara	6	2	512	0.683
Waterbody	5	Khepupara	6	2	508	0.683
Waterbody	5	Khepupara	6	2	448	0.094
Waterbody	5	Khepupara	6	2	442	0.094
Waterbody	5	Khepupara	6	2	442	0.051
Waterbody	5	Khepupara	6	2	442	0.036
Waterbody	5	Khepupara	6	2	483	0.220
Waterbody	5	Khepupara	6	2	461	0.220
Waterbody	5	Khepupara	6	2	473	0.039
Waterbody	5	Khepupara	6	2	503	0.028
Waterbody	5	Khepupara	6	2	463	0.075
Waterbody	5	Khepupara	6	2	458	0.062
Waterbody	5	Khepupara	6	2	455	0.033
Waterbody	5	Khepupara	6	2	431	0.362
Waterbody	5	Khepupara	6	2	512	0.008
Waterbody	6	Khepupara	6	3	905	0.443
Waterbody	6	Khepupara	6	3	1119	0.443
Waterbody	6	Khepupara	6	3	958	0.140
Waterbody	6	Khepupara	6	3	958	0.106
Waterbody	6	Khepupara	6	3	955	0.106

Landuse	Ward No.	Mouza	JL	Sheet	Plot No.	Area (Acre)
Waterbody	6	Khepupara	6	3	955	0.077
Waterbody	6	Khepupara	6	3	955	0.231
Waterbody	6	Khepupara	6	3	961	0.184
Waterbody	6	Khepupara	6	3	961	0.528
Waterbody	6	Khepupara	6	3	955	0.036
Waterbody	6	Khepupara	6	3	961	0.036
Waterbody	6	Khepupara	6	3	962	0.036
Waterbody	6	Khepupara	6	3	955	0.058
Waterbody	6	Khepupara	6	3	966	0.058
Waterbody	6	Khepupara	6	3	965	0.058
Waterbody	6	Khepupara	6	3	962	0.130
Waterbody	6	Khepupara	6	3	964	0.130
Waterbody	6	Khepupara	6	3	966	0.187
Waterbody	6	Khepupara	6	3	967	0.187
Waterbody	6	Khepupara	6	3	965	0.187
Waterbody	6	Khepupara	6	3	892	0.343
Waterbody	6	Khepupara	6	3	890	0.343
Waterbody	6	Khepupara	6	3	889	0.343
Waterbody	6	Khepupara	6	3	1116	0.000
Waterbody	6	Khepupara	6	3	1115	0.000
Waterbody	6	Khepupara	6	3	926	0.000
Waterbody	6	Khepupara	6	3	923	0.000
Waterbody	6	Khepupara	6	3	958	0.128
Waterbody	7	Khepupara	6	3	983	0.206
Waterbody	7	Khepupara	6	3	985	0.206
Waterbody	7	Khepupara	6	3	986	0.206
Waterbody	7	Khepupara	6	3	986	0.072
Waterbody	7	Khepupara	6	3	998	0.072
Waterbody	7	Khepupara	6	3	999	0.072
Waterbody	7	Khepupara	6	3	998	0.052
Waterbody	7	Khepupara	6	3	981	0.194
Waterbody	7	Khepupara	6	3	1011	0.027
Waterbody	7	Khepupara	6	3	1011	0.114
Waterbody	7	Khepupara	6	3	1011	0.033
Waterbody	7	Khepupara	6	3	1011	0.059
Waterbody	7	Khepupara	6	3	1011	0.046
Waterbody	7	Khepupara	6	3	1006	0.097
Waterbody	7	Khepupara	6	3	1011	0.097
Waterbody	7	Khepupara	6	3	1011	0.091
Waterbody	7	Khepupara	6	3	1006	0.177
Waterbody	7	Khepupara	6	3	1011	0.127
Waterbody	7	Khepupara	6	3	1007	0.313
Waterbody	7	Khepupara	6	3	1008	0.313
Waterbody	7	Khepupara	6	3	1019	0.114
Waterbody	7	Khepupara	6	3	1019	0.085
Waterbody	7	Khepupara	6	3	1019	0.050
Waterbody	7	Khepupara	6	3	1019	0.035
Waterbody	7	Khepupara	6	3	991	0.126
Waterbody	7	Khepupara	6	3	991	0.054
Waterbody	7	Khepupara	6	3	1072	0.190
Waterbody	7	Khepupara	6	3	987	0.190
Waterbody	7	Khepupara	6	3	991	0.190
Waterbody	7	Khepupara	6	3	986	0.190
Waterbody	7	Khepupara	6	3	986	0.159
Waterbody	7	Khepupara	6	3	987	0.088
Waterbody	7	Khepupara	6	3	986	0.088
Waterbody	7	Khepupara	6	3	986	0.057
Waterbody	7	Khepupara	6	3	1072	0.131
Waterbody	7	Khepupara	6	3	991	0.131
Waterbody	7	Khepupara	6	3	988	0.131
Waterbody	7	Khepupara	6	3	986	0.131
Waterbody	7	Khepupara	6	3	983	0.153
Waterbody	7	Khepupara	6	3	985	0.153
Waterbody	7	Khepupara	6	3	986	0.153
Waterbody	7	Khepupara	6	3	983	0.265
Waterbody	7	Khepupara	6	3	985	0.265
Waterbody	7	Khepupara	6	3	986	0.265
Waterbody	7	Khepupara	6	3	991	0.149
Waterbody	7	Khepupara	6	3	986	1.593

Landuse	Ward No.	Mouza	JL	Sheet	Plot No.	Area (Acre)
Waterbody	7	Khepupara	6	3	997	1.593
Waterbody	7	Khepupara	6	3	986	0.348
Waterbody	7	Khepupara	6	3	999	0.348
Waterbody	7	Khepupara	6	3	986	0.096
Waterbody	7	Khepupara	6	3	1016	4.612
Waterbody	7	Khepupara	6	3	1000	4.612
Waterbody	7	Khepupara	6	3	1014	4.612
Waterbody	7	Khepupara	6	3	1009	4.612
Waterbody	7	Khepupara	6	3	992	4.612
Waterbody	7	Khepupara	6	3	888	4.612
Waterbody	7	Khepupara	6	3	993	4.612
Waterbody	7	Khepupara	6	2	476	4.612
Waterbody	7	Khepupara	6	2	482	4.612
Waterbody	7	Khepupara	6	3	998	4.612
Waterbody	7	Khepupara	6	2	478	4.612
Waterbody	7	Khepupara	6	3	995	4.612
Waterbody	7	Khepupara	6	2	484	4.612
Waterbody	7	Khepupara	6	2	475	4.612
Waterbody	7	Khepupara	6	3	1059	4.612
Waterbody	7	Khepupara	6	3	1010	4.612
Waterbody	7	Khepupara	6	2	464	4.612
Waterbody	7	Khepupara	6	2	474	4.612
Waterbody	7	Khepupara	6	2	473	4.612
Waterbody	7	Khepupara	6	2	465	4.612
Waterbody	7	Khepupara	6	3	1011	4.612
Waterbody	7	Khepupara	6	2	472	4.612
Waterbody	7	Khepupara	6	3	1012	4.612
Waterbody	7	Khepupara	6	3	1013	4.612
Waterbody	7	Khepupara	6	2	467	4.612
Waterbody	7	Khepupara	6	2	599	4.612
Waterbody	7	Khepupara	6	2	488	4.612
Waterbody	7	Khepupara	6	3	983	0.588
Waterbody	7	Khepupara	6	3	1019	0.135
Waterbody	7	Khepupara	6	3	1019	0.079
Waterbody	7	Khepupara	6	3	1019	0.077
Waterbody	7	Khepupara	6	3	986	0.077
Waterbody	7	Khepupara	6	3	1011	0.020
Waterbody	7	Khepupara	6	3	1011	0.048
Waterbody	7	Khepupara	6	3	1016	0.397
Waterbody	7	Khepupara	6	3	1019	0.397
Waterbody	7	Khepupara	6	3	1018	0.397
Waterbody	7	Khepupara	6	3	1015	0.397
Waterbody	7	Khepupara	6	3	1014	0.397
Waterbody	7	Khepupara	6	3	986	0.131
Waterbody	7	Khepupara	6	3	997	0.131
Waterbody	7	Khepupara	6	3	1011	0.001
Waterbody	8	Khepupara	6	3	967	0.097
Waterbody	8	Khepupara	6	3	970	0.106
Waterbody	8	Khepupara	6	3	969	0.106
Waterbody	8	Khepupara	6	3	968	0.106
Waterbody	8	Khepupara	6	3	968	0.123
Waterbody	8	Khepupara	6	3	967	0.123
Waterbody	8	Khepupara	6	3	970	0.097
Waterbody	8	Khepupara	6	3	969	0.097
Waterbody	8	Khepupara	6	3	969	0.120
Waterbody	8	Khepupara	6	3	968	0.120
Waterbody	8	Khepupara	6	3	967	0.120
Waterbody	8	Khepupara	6	3	965	0.120
Waterbody	8	Khepupara	6	3	970	0.222
Waterbody	8	Khepupara	6	3	971	0.461
Waterbody	8	Khepupara	6	3	970	0.461
Waterbody	8	Khepupara	6	3	972	0.093
Waterbody	8	Khepupara	6	3	951	0.195
Waterbody	8	Khepupara	6	3	1064	0.195
Waterbody	8	Khepupara	6	3	970	0.195
Waterbody	8	Khepupara	6	3	970	0.079
Waterbody	8	Khepupara	6	3	953	0.191
Waterbody	8	Khepupara	6	3	955	0.191
Waterbody	8	Khepupara	6	3	949	0.052

Landuse	Ward No.	Mouza	JL	Sheet	Plot No.	Area (Acre)
Waterbody	8	Khepupara	6	3	950	0.052
Waterbody	8	Khepupara	6	3	1064	0.052
Waterbody	8	Khepupara	6	3	950	0.072
Waterbody	8	Khepupara	6	3	1064	0.072
Waterbody	8	Khepupara	6	3	970	0.072
Waterbody	8	Khepupara	6	3	948	0.050
Waterbody	8	Khepupara	6	3	1069	0.050
Waterbody	8	Khepupara	6	3	1038	0.107
Waterbody	8	Khepupara	6	3	972	0.107
Waterbody	8	Khepupara	6	3	1094	0.084
Waterbody	8	Khepupara	6	3	972	0.084
Waterbody	8	Khepupara	6	3	1095	0.098
Waterbody	8	Khepupara	6	3	1098	0.108
Waterbody	8	Khepupara	6	3	1098	0.123
Waterbody	8	Khepupara	6	3	973	0.146
Waterbody	8	Khepupara	6	3	1094	0.069
Waterbody	8	Khepupara	6	3	972	0.046
Waterbody	8	Khepupara	6	3	948	0.036
Waterbody	8	Khepupara	6	3	946	0.072
Waterbody	8	Khepupara	6	3	1038	0.072
Waterbody	8	Khepupara	6	3	948	0.072
Waterbody	8	Khepupara	6	3	945	0.104
Waterbody	8	Khepupara	6	3	1099	0.237
Waterbody	8	Khepupara	6	3	1100	0.237
Waterbody	8	Khepupara	6	3	981	0.142
Waterbody	8	Khepupara	6	3	981	0.187
Waterbody	8	Khepupara	6	3	1021	0.150
Waterbody	8	Khepupara	6	3	1021	0.059
Waterbody	8	Khepupara	6	3	981	0.059
Waterbody	8	Khepupara	6	3	972	0.096
Waterbody	8	Khepupara	6	3	1094	0.102
Waterbody	8	Khepupara	6	3	980	0.098
Waterbody	8	Khepupara	6	3	1097	0.098
Waterbody	8	Khepupara	6	3	1095	0.098
Waterbody	8	Khepupara	6	3	1023	0.096
Waterbody	8	Khepupara	6	3	1022	0.096
Waterbody	8	Khepupara	6	3	977	0.125
Waterbody	8	Khepupara	6	3	978	0.125
Waterbody	8	Khepupara	6	3	1023	0.126
Waterbody	8	Khepupara	6	3	1098	0.210
Waterbody	8	Khepupara	6	3	973	0.210
Waterbody	8	Khepupara	6	3	1063	0.210
Waterbody	8	Khepupara	6	3	974	0.210
Waterbody	8	Khepupara	6	3	975	0.210
Waterbody	8	Khepupara	6	3	977	0.210
Waterbody	8	Khepupara	6	3	1025	0.064
Waterbody	8	Khepupara	6	3	1025	0.171
Waterbody	8	Khepupara	6	3	1025	0.049
Waterbody	8	Khepupara	6	3	1026	0.104
Waterbody	8	Khepupara	6	3	1026	0.158
Waterbody	8	Khepupara	6	3	1027	0.358
Waterbody	8	Khepupara	6	3	1026	0.121
Waterbody	8	Khepupara	6	3	1025	0.047
Waterbody	8	Khepupara	6	3	1021	0.153
Waterbody	8	Khepupara	6	3	1021	0.150
Waterbody	8	Khepupara	6	3	1019	0.126
Waterbody	8	Khepupara	6	3	1019	0.140
Waterbody	8	Khepupara	6	3	1019	0.126
Waterbody	8	Khepupara	6	3	1019	0.182
Waterbody	8	Khepupara	6	3	1019	0.058
Waterbody	8	Khepupara	6	3	1019	0.076
Waterbody	8	Khepupara	6	3	1022	0.718
Waterbody	8	Khepupara	6	3	1019	0.718
Waterbody	8	Khepupara	6	3	1073	0.097
Waterbody	8	Khepupara	6	3	1019	0.097
Waterbody	8	Khepupara	6	3	1028	0.497
Waterbody	8	Khepupara	6	3	1075	0.497
Waterbody	8	Khepupara	6	3	1074	0.497
Waterbody	8	Khepupara	6	3	1022	0.497

Landuse	Ward No.	Mouza	JL	Sheet	Plot No.	Area (Acre)
Waterbody	8	Khepupara	6	3	1076	0.497
Waterbody	8	Khepupara	6	3	1073	0.497
Waterbody	8	Khepupara	6	3	1019	0.497
Waterbody	8	Khepupara	6	3	1076	0.009
Waterbody	8	Khepupara	6	3	1075	0.053
Waterbody	8	Khepupara	6	3	1074	0.053
Waterbody	8	Khepupara	6	3	1076	0.053
Waterbody	8	Khepupara	6	3	1028	0.076
Waterbody	8	Khepupara	6	3	1074	0.076
Waterbody	8	Khepupara	6	3	1028	0.064
Waterbody	8	Khepupara	6	3	1028	0.030
Waterbody	8	Khepupara	6	3	1028	0.071
Waterbody	8	Khepupara	6	3	1028	0.134
Waterbody	8	Badurtali	7	3	22222	0.033
Waterbody	8	Khepupara	6	3	1028	0.033
Waterbody	8	Khepupara	6	3	1028	0.046
Waterbody	8	Badurtali	7	3	22222	0.090
Waterbody	8	Khepupara	6	3	1028	0.090
Waterbody	8	Khepupara	6	3	1028	0.131
Waterbody	8	Khepupara	6	3	1019	0.079
Waterbody	8	Khepupara	6	3	1023	0.114
Waterbody	8	Khepupara	6	3	1023	0.123
Waterbody	8	Khepupara	6	3	1060	0.077
Waterbody	8	Khepupara	6	3	1023	0.146
Waterbody	8	Khepupara	6	3	1023	0.091
Waterbody	8	Khepupara	6	3	1040	0.220
Waterbody	8	Khepupara	6	3	1041	0.031
Waterbody	8	Khepupara	6	3	1040	0.109
Waterbody	8	Khepupara	6	3	1037	0.109
Waterbody	8	Badurtali	7	3	22222	0.109
Waterbody	8	Khepupara	6	3	1038	0.109
Waterbody	8	Khepupara	6	3	1025	0.109
Waterbody	8	Khepupara	6	3	1041	0.092
Waterbody	8	Khepupara	6	3	1041	0.057
Waterbody	8	Khepupara	6	3	1035	0.057
Waterbody	8	Khepupara	6	3	1041	0.082
Waterbody	8	Khepupara	6	3	1036	0.119
Waterbody	8	Khepupara	6	3	1041	0.119
Waterbody	8	Khepupara	6	3	1035	0.119
Waterbody	8	Khepupara	6	3	1042	0.082
Waterbody	8	Khepupara	6	3	1028	0.081
Waterbody	8	Khepupara	6	3	1028	0.117
Waterbody	8	Khepupara	6	3	1027	0.164
Waterbody	8	Khepupara	6	3	1027	0.148
Waterbody	8	Khepupara	6	3	1027	0.208
Waterbody	8	Badurtali	7	3	22222	0.310
Waterbody	8	Khepupara	6	3	1026	0.310
Waterbody	8	Khepupara	6	3	1025	0.075
Waterbody	8	Khepupara	6	3	949	0.071
Waterbody	8	Khepupara	6	3	1042	0.040
Waterbody	8	Khepupara	6	3	1023	0.036
Waterbody	8	Badurtali	7	3	22222	0.022
Waterbody	8	Khepupara	6	3	1028	0.022
Waterbody	8	Khepupara	6	3	1075	0.016
Waterbody	8	Khepupara	6	3	1075	0.011
Waterbody	8	Khepupara	6	3	1076	0.011
Waterbody	8	Khepupara	6	3	1049	0.000
Waterbody	8	Khepupara	6	3	1047	0.000
Waterbody	8	Khepupara	6	3	1043	0.001
Waterbody	8	Khepupara	6	3	940	0.001
Waterbody	8	Khepupara	6	3	969	0.002
Waterbody	8	Khepupara	6	3	968	0.002
Waterbody	9	Badurtali	7	3	990	65.020
Waterbody	9	Badurtali	7	3	925	65.020
Waterbody	9	Badurtali	7	3	765	65.020
Waterbody	9	Badurtali	7	3	752	65.020
Waterbody	9	Badurtali	7	3	751	65.020
Waterbody	9	Badurtali	7	3	744	65.020
Waterbody	9	Badurtali	7	3	743	65.020

Landuse	Ward No.	Mouza	JL	Sheet	Plot No.	Area (Acre)
Waterbody	9	Badurtali	7	3	742	65.020
Waterbody	9	Badurtali	7	3	746	65.020
Waterbody	9	Badurtali	7	3	738	65.020
Waterbody	9	Badurtali	7	3	745	65.020
Waterbody	9	Badurtali	7	3	741	65.020
Waterbody	9	Badurtali	7	3	739	65.020
Waterbody	9	Badurtali	7	3	736	65.020
Waterbody	9	Badurtali	7	3	737	65.020
Waterbody	9	Badurtali	7	3	735	65.020
Waterbody	9	Badurtali	7	3	979	65.020
Waterbody	9	Badurtali	7	3	734	65.020
Waterbody	9	Badurtali	7	3	733	65.020
Waterbody	9	Badurtali	7	3	732	65.020
Waterbody	9	Badurtali	7	3	731	65.020
Waterbody	9	Badurtali	7	3	701	65.020
Waterbody	9	Badurtali	7	3	700	65.020
Waterbody	9	Badurtali	7	3	699	65.020
Waterbody	9	Badurtali	7	3	690	65.020
Waterbody	9	Badurtali	7	3	716	65.020
Waterbody	9	Badurtali	7	3	715	65.020
Waterbody	9	Badurtali	7	3	714	65.020
Waterbody	9	Badurtali	7	3	688	65.020
Waterbody	9	Badurtali	7	3	713	65.020
Waterbody	9	Badurtali	7	3	687	65.020
Waterbody	9	Badurtali	7	3	675	65.020
Waterbody	9	Badurtali	7	3	685	65.020
Waterbody	9	Badurtali	7	3	689	65.020
Waterbody	9	Badurtali	7	3	686	65.020
Waterbody	9	Badurtali	7	3	684	65.020
Waterbody	9	Khepupara	6	3	1068	65.020
Waterbody	9	Khepupara	6	3	1067	65.020
Waterbody	9	Khepupara	6	3	1049	65.020
Waterbody	9	Khepupara	6	3	1048	65.020
Waterbody	9	Badurtali	7	3	678	65.020
Waterbody	9	Khepupara	6	3	1066	65.020
Waterbody	9	Badurtali	7	3	677	65.020
Waterbody	9	Badurtali	7	3	680	65.020
Waterbody	9	Badurtali	7	3	670	65.020
Waterbody	9	Khepupara	6	3	1065	65.020
Waterbody	9	Badurtali	7	3	683	65.020
Waterbody	9	Khepupara	6	3	1045	65.020
Waterbody	9	Khepupara	6	3	1044	65.020
Waterbody	9	Khepupara	6	3	1047	65.020
Waterbody	9	Khepupara	6	3	1046	65.020
Waterbody	9	Khepupara	6	3	1108	65.020
Waterbody	9	Khepupara	6	3	1043	65.020
Waterbody	9	Khepupara	6	3	939	65.020
Waterbody	9	Khepupara	6	3	938	65.020
Waterbody	9	Khepupara	6	3	934	65.020
Waterbody	9	Khepupara	6	3	940	65.020
Waterbody	9	Khepupara	6	3	937	65.020
Waterbody	9	Khepupara	6	3	935	65.020
Waterbody	9	Khepupara	6	3	1107	65.020
Waterbody	9	Khepupara	6	3	932	65.020
Waterbody	9	Khepupara	6	3	1106	65.020
Waterbody	9	Khepupara	6	3	1105	65.020
Waterbody	9	Khepupara	6	3	936	65.020
Waterbody	9	Khepupara	6	3	933	65.020
Waterbody	9	Badurtali	7	3	676	65.020
Waterbody	9	Khepupara	6	3	931	65.020
Waterbody	9	Khepupara	6	3	929	65.020
Waterbody	9	Khepupara	6	3	930	65.020
Waterbody	9	Khepupara	6	3	1109	65.020
Waterbody	9	Khepupara	6	3	1136	65.020
Waterbody	9	Khepupara	6	3	928	65.020
Waterbody	9	Khepupara	6	3	925	65.020
Waterbody	9	Khepupara	6	3	927	65.020
Waterbody	9	Khepupara	6	3	1137	65.020
Waterbody	9	Khepupara	6	3	1135	65.020

Landuse	Ward No.	Mouza	JL	Sheet	Plot No.	Area (Acre)
Waterbody	9	Khepupara	6	3	703	65.020
Waterbody	9	Khepupara	6	3	1138	65.020
Waterbody	9	Khepupara	6	3	1116	65.020
Waterbody	9	Khepupara	6	3	1057	65.020
Waterbody	9	Khepupara	6	3	1139	65.020
Waterbody	9	Khepupara	6	3	924	65.020
Waterbody	9	Khepupara	6	3	1115	65.020
Waterbody	9	Khepupara	6	3	1090	65.020
Waterbody	9	Khepupara	6	3	701	65.020
Waterbody	9	Khepupara	6	3	1114	65.020
Waterbody	9	Khepupara	6	3	704	65.020
Waterbody	9	Khepupara	6	3	700	65.020
Waterbody	9	Khepupara	6	3	926	65.020
Waterbody	9	Khepupara	6	3	705	65.020
Waterbody	9	Khepupara	6	3	1113	65.020
Waterbody	9	Khepupara	6	3	702	65.020
Waterbody	9	Khepupara	6	3	699	65.020
Waterbody	9	Khepupara	6	3	698	65.020
Waterbody	9	Khepupara	6	3	706	65.020
Waterbody	9	Khepupara	6	3	672	65.020
Waterbody	9	Khepupara	6	3	1055	65.020
Waterbody	9	Khepupara	6	3	707	65.020
Waterbody	9	Khepupara	6	3	671	65.020
Waterbody	9	Khepupara	6	3	923	65.020
Waterbody	9	Khepupara	6	3	670	65.020
Waterbody	9	Khepupara	6	3	697	65.020
Waterbody	9	Khepupara	6	3	708	65.020
Waterbody	9	Khepupara	6	3	1080	65.020
Waterbody	9	Khepupara	6	3	709	65.020
Waterbody	9	Khepupara	6	3	696	65.020
Waterbody	9	Khepupara	6	3	710	65.020
Waterbody	9	Khepupara	6	3	695	65.020
Waterbody	9	Khepupara	6	3	711	65.020
Waterbody	9	Khepupara	6	3	712	65.020
Waterbody	9	Khepupara	6	3	694	65.020
Waterbody	9	Khepupara	6	3	673	65.020
Waterbody	9	Khepupara	6	3	693	65.020
Waterbody	9	Khepupara	6	3	692	65.020
Waterbody	9	Khepupara	6	3	713	65.020
Waterbody	9	Khepupara	6	3	669	65.020
Waterbody	9	Khepupara	6	3	668	65.020
Waterbody	9	Khepupara	6	3	674	65.020
Waterbody	9	Khepupara	6	3	666	65.020
Waterbody	9	Khepupara	6	3	667	65.020
Waterbody	9	Khepupara	6	3	1091	65.020
Waterbody	9	Khepupara	6	3	724	65.020
Waterbody	9	Khepupara	6	3	721	65.020
Waterbody	9	Khepupara	6	3	657	65.020
Waterbody	9	Khepupara	6	3	1092	65.020
Waterbody	9	Khepupara	6	3	658	65.020
Waterbody	9	Khepupara	6	3	656	65.020
Waterbody	9	Khepupara	6	3	630	65.020
Waterbody	9	Khepupara	6	3	629	65.020
Waterbody	9	Khepupara	6	3	631	65.020
Waterbody	9	Khepupara	6	3	662	65.020
Waterbody	9	Khepupara	6	3	655	65.020
Waterbody	9	Khepupara	6	3	1056	65.020
Waterbody	9	Khepupara	6	3	634	65.020
Waterbody	9	Khepupara	6	3	635	65.020
Waterbody	9	Khepupara	6	3	624	65.020
Waterbody	9	Khepupara	6	3	628	65.020
Waterbody	9	Khepupara	6	3	622	65.020
Waterbody	9	Khepupara	6	1	253	65.020
Waterbody	9	Khepupara	6	3	621	65.020
Waterbody	9	Khepupara	6	1	248	65.020
Waterbody	9	Khepupara	6	3	619	65.020
Waterbody	9	Khepupara	6	1	247	65.020
Waterbody	9	Khepupara	6	1	246	65.020
Waterbody	9	Khepupara	6	1	249	65.020

Landuse	Ward No.	Mouza	JL	Sheet	Plot No.	Area (Acre)
Waterbody	9	Khepupara	6	1	250	65.020
Waterbody	9	Khepupara	6	1	242	65.020
Waterbody	9	Khepupara	6	1	241	65.020
Waterbody	9	Khepupara	6	1	237	65.020
Waterbody	9	Khepupara	6	1	231	65.020
Waterbody	9	Khepupara	6	1	205	65.020
Waterbody	9	Khepupara	6	1	232	65.020
Waterbody	9	Khepupara	6	1	206	65.020
Waterbody	9	Khepupara	6	1	228	65.020
Waterbody	9	Khepupara	6	1	212	65.020
Waterbody	9	Khepupara	6	1	229	65.020
Waterbody	9	Khepupara	6	1	226	65.020
Waterbody	9	Khepupara	6	1	227	65.020
Waterbody	9	Khepupara	6	1	211	65.020
Waterbody	9	Khepupara	6	1	230	65.020
Waterbody	9	Khepupara	6	1	209	65.020
Waterbody	9	Khepupara	6	1	207	65.020
Waterbody	9	Khepupara	6	1	296	65.020
Waterbody	9	Khepupara	6	1	210	65.020
Waterbody	9	Khepupara	6	1	224	65.020
Waterbody	9	Khepupara	6	1	225	65.020
Waterbody	9	Khepupara	6	1	220	65.020
Waterbody	9	Khepupara	6	3	888	65.020
Waterbody	9	Khepupara	6	1	245	65.020
Waterbody	9	Khepupara	6	1	243	65.020
Waterbody	9	Khepupara	6	1	219	65.020
Waterbody	9	Khepupara	6	1	213	65.020
Waterbody	9	Khepupara	6	1	240	65.020
Waterbody	9	Khepupara	6	1	238	65.020
Waterbody	9	Khepupara	6	1	236	65.020
Waterbody	9	Khepupara	6	1	208	65.020
Waterbody	9	Khepupara	6	1	254	65.020
Waterbody	9	Badurtali	7	3	815	65.020
Waterbody	9	Badurtali	7	3	816	65.020
Waterbody	9	Khepupara	6	1	201	65.020
Waterbody	9	Badurtali	7	3	614	0.071
Waterbody	9	Badurtali	7	3	613	0.071
Waterbody	9	Badurtali	7	3	608	0.071
Waterbody	9	Badurtali	7	3	608	0.187
Waterbody	9	Badurtali	7	3	612	0.186
Waterbody	9	Badurtali	7	3	618	0.186
Waterbody	9	Badurtali	7	3	619	0.186
Waterbody	9	Badurtali	7	3	614	0.186
Waterbody	9	Badurtali	7	3	611	0.022
Waterbody	9	Badurtali	7	3	610	0.022
Waterbody	9	Badurtali	7	3	613	0.022
Waterbody	9	Badurtali	7	3	608	0.022
Waterbody	9	Badurtali	7	3	610	0.049
Waterbody	9	Badurtali	7	3	612	0.063
Waterbody	9	Badurtali	7	3	612	0.049
Waterbody	9	Badurtali	7	3	612	0.047
Waterbody	9	Badurtali	7	3	621	0.568
Waterbody	9	Badurtali	7	3	620	0.568
Waterbody	9	Badurtali	7	3	622	0.568
Waterbody	9	Badurtali	7	3	612	0.568
Waterbody	9	Badurtali	7	3	623	0.040
Waterbody	9	Badurtali	7	3	624	0.052
Waterbody	9	Badurtali	7	3	623	0.052
Waterbody	9	Badurtali	7	3	627	0.455
Waterbody	9	Badurtali	7	3	624	0.455
Waterbody	9	Badurtali	7	3	638	0.138
Waterbody	9	Badurtali	7	3	639	0.138
Waterbody	9	Badurtali	7	3	637	0.138
Waterbody	9	Badurtali	7	3	632	0.138
Waterbody	9	Badurtali	7	3	994	0.086
Waterbody	9	Badurtali	7	3	670	0.086
Waterbody	9	Badurtali	7	3	815	0.086
Waterbody	9	Badurtali	7	3	721	0.156
Waterbody	9	Badurtali	7	3	721	0.297

Landuse	Ward No.	Mouza	JL	Sheet	Plot No.	Area (Acre)
Waterbody	9	Badurtali	7	3	725	0.111
Waterbody	9	Badurtali	7	3	726	0.134
Waterbody	9	Badurtali	7	3	727	0.134
Waterbody	9	Badurtali	7	3	719	0.034
Waterbody	9	Badurtali	7	3	714	0.177
Waterbody	9	Badurtali	7	3	713	0.177
Waterbody	9	Badurtali	7	3	990	0.532
Waterbody	9	Badurtali	7	3	816	0.532
Waterbody	9	Badurtali	7	3	925	0.290
Waterbody	9	Badurtali	7	3	925	0.231
Waterbody	9	Badurtali	7	3	925	0.068
Waterbody	9	Badurtali	7	3	925	0.052
Waterbody	9	Badurtali	7	3	924	0.052
Waterbody	9	Badurtali	7	3	924	0.051
Waterbody	9	Badurtali	7	3	924	0.048
Waterbody	9	Badurtali	7	3	924	0.512
Waterbody	9	Badurtali	7	3	766	0.085
Waterbody	9	Badurtali	7	3	815	0.085
Waterbody	9	Badurtali	7	3	766	0.055
Waterbody	9	Badurtali	7	3	992	0.055
Waterbody	9	Badurtali	7	3	815	0.055
Waterbody	9	Badurtali	7	3	992	0.050
Waterbody	9	Badurtali	7	3	992	0.064
Waterbody	9	Badurtali	7	3	787	0.041
Waterbody	9	Badurtali	7	3	788	0.041
Waterbody	9	Badurtali	7	3	787	0.059
Waterbody	9	Badurtali	7	3	788	0.059
Waterbody	9	Badurtali	7	3	788	0.036
Waterbody	9	Badurtali	7	3	815	0.017
Waterbody	9	Badurtali	7	3	789	0.040
Waterbody	9	Badurtali	7	3	815	0.040
Waterbody	9	Badurtali	7	3	788	0.173
Waterbody	9	Badurtali	7	3	789	0.173
Waterbody	9	Badurtali	7	3	816	0.053
Waterbody	9	Badurtali	7	3	789	0.128
Waterbody	9	Badurtali	7	3	815	0.128
Waterbody	9	Badurtali	7	3	815	0.020
Waterbody	9	Badurtali	7	3	815	0.039
Waterbody	9	Badurtali	7	3	816	0.039
Waterbody	9	Badurtali	7	3	790	0.077
Waterbody	9	Badurtali	7	3	815	0.024
Waterbody	9	Badurtali	7	3	815	0.038
Waterbody	9	Badurtali	7	3	816	0.038
Waterbody	9	Badurtali	7	3	815	0.061
Waterbody	9	Badurtali	7	3	816	0.061
Waterbody	9	Badurtali	7	3	768	0.124
Waterbody	9	Badurtali	7	3	769	0.124
Waterbody	9	Badurtali	7	3	770	0.124
Waterbody	9	Badurtali	7	3	784	0.122
Waterbody	9	Badurtali	7	3	770	0.122
Waterbody	9	Badurtali	7	3	773	0.122
Waterbody	9	Badurtali	7	3	784	0.056
Waterbody	9	Badurtali	7	3	784	0.054
Waterbody	9	Badurtali	7	3	770	0.087
Waterbody	9	Badurtali	7	3	770	0.323
Waterbody	9	Badurtali	7	3	770	0.103
Waterbody	9	Badurtali	7	3	785	0.164
Waterbody	9	Badurtali	7	3	770	0.164
Waterbody	9	Badurtali	7	3	773	0.164
Waterbody	9	Badurtali	7	3	771	0.070
Waterbody	9	Badurtali	7	3	772	0.070
Waterbody	9	Badurtali	7	3	724	0.070
Waterbody	9	Badurtali	7	3	670	0.070
Waterbody	9	Badurtali	7	3	772	0.097
Waterbody	9	Badurtali	7	3	773	0.097
Waterbody	9	Badurtali	7	3	670	0.097
Waterbody	9	Badurtali	7	3	781	0.109
Waterbody	9	Badurtali	7	3	772	0.109
Waterbody	9	Badurtali	7	3	773	0.109

Landuse	Ward No.	Mouza	JL	Sheet	Plot No.	Area (Acre)
Waterbody	9	Badurtali	7	3	772	0.064
Waterbody	9	Badurtali	7	3	809	0.064
Waterbody	9	Badurtali	7	3	775	0.053
Waterbody	9	Badurtali	7	3	776	0.053
Waterbody	9	Badurtali	7	3	773	0.053
Waterbody	9	Badurtali	7	3	809	0.053
Waterbody	9	Badurtali	7	3	775	0.024
Waterbody	9	Badurtali	7	3	776	0.024
Waterbody	9	Badurtali	7	3	773	0.024
Waterbody	9	Badurtali	7	3	781	0.173
Waterbody	9	Badurtali	7	3	774	0.173
Waterbody	9	Badurtali	7	3	775	0.173
Waterbody	9	Badurtali	7	3	776	0.173
Waterbody	9	Badurtali	7	3	775	0.039
Waterbody	9	Badurtali	7	3	776	0.039
Waterbody	9	Badurtali	7	3	776	0.041
Waterbody	9	Badurtali	7	3	792	0.041
Waterbody	9	Badurtali	7	3	792	0.169
Waterbody	9	Badurtali	7	3	792	0.113
Waterbody	9	Badurtali	7	3	792	0.026
Waterbody	9	Badurtali	7	3	800	0.087
Waterbody	9	Badurtali	7	3	799	0.087
Waterbody	9	Badurtali	7	3	801	0.087
Waterbody	9	Badurtali	7	3	800	0.026
Waterbody	9	Badurtali	7	3	801	0.020
Waterbody	9	Badurtali	7	3	801	0.019
Waterbody	9	Badurtali	7	3	801	0.022
Waterbody	9	Badurtali	7	3	801	0.026
Waterbody	9	Badurtali	7	3	801	0.045
Waterbody	9	Badurtali	7	3	805	0.045
Waterbody	9	Badurtali	7	3	815	0.045
Waterbody	9	Badurtali	7	3	804	0.093
Waterbody	9	Badurtali	7	3	806	0.232
Waterbody	9	Badurtali	7	3	806	0.129
Waterbody	9	Badurtali	7	3	806	0.077
Waterbody	9	Badurtali	7	3	807	0.077
Waterbody	9	Badurtali	7	3	811	0.040
Waterbody	9	Badurtali	7	3	807	0.040
Waterbody	9	Badurtali	7	3	811	0.078
Waterbody	9	Badurtali	7	3	807	0.078
Waterbody	9	Badurtali	7	3	808	0.115
Waterbody	9	Badurtali	7	3	811	0.115
Waterbody	9	Badurtali	7	3	807	0.115
Waterbody	9	Badurtali	7	3	808	0.123
Waterbody	9	Badurtali	7	3	811	0.123
Waterbody	9	Badurtali	7	3	808	0.057
Waterbody	9	Badurtali	7	3	811	0.057
Waterbody	9	Badurtali	7	3	808	0.070
Waterbody	9	Badurtali	7	3	811	0.070
Waterbody	9	Badurtali	7	3	811	0.052
Waterbody	9	Badurtali	7	3	813	0.052
Waterbody	9	Badurtali	7	3	815	0.052
Waterbody	9	Badurtali	7	3	811	0.056
Waterbody	9	Badurtali	7	3	813	0.056
Waterbody	9	Badurtali	7	3	815	0.056
Waterbody	9	Badurtali	7	3	811	0.059
Waterbody	9	Badurtali	7	3	813	0.059
Waterbody	9	Badurtali	7	3	811	0.046
Waterbody	9	Badurtali	7	3	813	0.046
Waterbody	9	Badurtali	7	3	811	0.017
Waterbody	9	Badurtali	7	3	811	0.044
Waterbody	9	Badurtali	7	3	813	0.044
Waterbody	9	Badurtali	7	3	812	0.037
Waterbody	9	Badurtali	7	3	813	0.037
Waterbody	9	Badurtali	7	3	780	0.108
Waterbody	9	Badurtali	7	3	780	0.102
Waterbody	9	Badurtali	7	3	781	0.102
Waterbody	9	Badurtali	7	3	783	0.017
Waterbody	9	Badurtali	7	3	780	0.017

Landuse	Ward No.	Mouza	JL	Sheet	Plot No.	Area (Acre)
Waterbody	9	Badurtali	7	3	784	0.061
Waterbody	9	Badurtali	7	3	785	0.071
Waterbody	9	Badurtali	7	3	811	0.037
Waterbody	9	Badurtali	7	3	807	0.037
Waterbody	9	Badurtali	7	3	813	0.037
Waterbody	9	Badurtali	7	3	807	0.069
Waterbody	9	Badurtali	7	3	813	0.069
Waterbody	9	Badurtali	7	3	815	0.069
Waterbody	9	Badurtali	7	3	816	0.069
Waterbody	9	Badurtali	7	3	809	0.058
Waterbody	9	Badurtali	7	3	810	0.058
Waterbody	9	Badurtali	7	3	921	0.081
Waterbody	9	Badurtali	7	3	916	0.057
Waterbody	9	Badurtali	7	3	916	0.034
Waterbody	9	Badurtali	7	3	916	0.029
Waterbody	9	Badurtali	7	3	735	0.513
Waterbody	9	Badurtali	7	3	730	0.513
Waterbody	9	Badurtali	7	3	980	0.513
Waterbody	9	Badurtali	7	3	734	0.513
Waterbody	9	Badurtali	7	3	719	0.513
Waterbody	9	Badurtali	7	3	670	0.513
Waterbody	9	Badurtali	7	3	925	32.746
Waterbody	9	Badurtali	7	3	916	32.746
Waterbody	9	Badurtali	7	3	914	32.746
Waterbody	9	Badurtali	7	3	985	32.746
Waterbody	9	Badurtali	7	3	913	32.746
Waterbody	9	Badurtali	7	3	986	32.746
Waterbody	9	Badurtali	7	3	987	32.746
Waterbody	9	Badurtali	7	3	988	32.746
Waterbody	9	Badurtali	7	3	650	32.746
Waterbody	9	Badurtali	7	3	639	32.746
Waterbody	9	Badurtali	7	3	632	32.746
Waterbody	9	Badurtali	7	3	627	32.746
Waterbody	9	Badurtali	7	3	626	32.746
Waterbody	9	Badurtali	7	3	610	32.746
Waterbody	9	Badurtali	7	3	607	32.746
Waterbody	9	Badurtali	7	3	609	32.746
Waterbody	9	Badurtali	7	3	815	32.746
Waterbody	9	Badurtali	7	3	814	32.746
Waterbody	9	Badurtali	7	3	816	32.746
Waterbody	9	Badurtali	7	3	603	0.212
Waterbody	9	Badurtali	7	3	601	0.082
Waterbody	9	Badurtali	7	3	606	0.182
Waterbody	9	Badurtali	7	3	601	0.182
Waterbody	9	Badurtali	7	3	603	0.084
Waterbody	9	Badurtali	7	3	603	0.046
Waterbody	9	Khepupara	6	3	1029	0.000
Waterbody	9	Badurtali	7	3	676	2.425
Waterbody	9	Badurtali	7	3	682	2.425
Waterbody	9	Badurtali	7	3	674	0.023
Waterbody	9	Badurtali	7	3	22222	0.105
Waterbody	9	Khepupara	6	3	1028	0.105
Waterbody	9	Badurtali	7	3	674	1.015
Waterbody	9	Badurtali	7	3	653	1.015
Waterbody	9	Badurtali	7	3	676	1.015
Waterbody	9	Badurtali	7	3	22222	1.015
Waterbody	9	Khepupara	6	3	1028	1.015
Waterbody	9	Badurtali	7	3	671	0.141
Waterbody	9	Badurtali	7	3	671	0.353
Waterbody	9	Badurtali	7	3	671	0.060
Waterbody	9	Badurtali	7	3	671	0.040
Waterbody	9	Badurtali	7	3	666	0.050
Waterbody	9	Badurtali	7	3	671	0.050
Waterbody	9	Badurtali	7	3	666	0.161
Waterbody	9	Badurtali	7	3	671	0.161
Waterbody	9	Badurtali	7	3	666	0.028
Waterbody	9	Badurtali	7	3	671	0.028
Waterbody	9	Badurtali	7	3	671	0.063
Waterbody	9	Badurtali	7	3	665	0.063

Landuse	Ward No.	Mouza	JL	Sheet	Plot No.	Area (Acre)
Waterbody	9	Badurtali	7	3	664	0.090
Waterbody	9	Badurtali	7	3	658	0.038
Waterbody	9	Badurtali	7	3	658	0.191
Waterbody	9	Badurtali	7	3	657	0.191
Waterbody	9	Badurtali	7	3	656	0.191
Waterbody	9	Badurtali	7	3	653	0.131
Waterbody	9	Badurtali	7	3	653	0.098
Waterbody	9	Badurtali	7	3	653	0.044
Waterbody	9	Badurtali	7	3	653	0.056
Waterbody	9	Badurtali	7	3	653	0.053
Waterbody	9	Badurtali	7	3	653	0.188
Waterbody	9	Badurtali	7	3	652	0.188
Waterbody	9	Badurtali	7	3	654	0.070
Waterbody	9	Badurtali	7	3	653	0.070
Waterbody	9	Badurtali	7	3	651	0.052
Waterbody	9	Badurtali	7	3	652	0.052
Waterbody	9	Badurtali	7	3	651	0.053
Waterbody	9	Badurtali	7	3	996	0.042
Waterbody	9	Badurtali	7	3	648	0.037
Waterbody	9	Badurtali	7	3	641	0.118
Waterbody	9	Badurtali	7	3	641	0.124
Waterbody	9	Badurtali	7	3	641	0.248
Waterbody	9	Badurtali	7	3	641	0.099
Waterbody	9	Badurtali	7	3	641	0.072
Waterbody	9	Badurtali	7	3	641	0.037
Waterbody	9	Badurtali	7	3	641	0.083
Waterbody	9	Badurtali	7	3	644	0.083
Waterbody	9	Badurtali	7	3	642	0.083
Waterbody	9	Badurtali	7	3	622	0.083
Waterbody	9	Badurtali	7	3	617	0.083
Waterbody	9	Badurtali	7	3	622	0.034
Waterbody	9	Badurtali	7	3	642	0.032
Waterbody	9	Badurtali	7	3	622	0.032
Waterbody	9	Badurtali	7	3	622	0.105
Waterbody	9	Badurtali	7	3	622	0.131
Waterbody	9	Badurtali	7	3	622	0.122
Waterbody	9	Badurtali	7	3	617	0.122
Waterbody	9	Badurtali	7	3	617	0.105
Waterbody	9	Badurtali	7	3	617	0.106
Waterbody	9	Badurtali	7	3	617	0.168
Waterbody	9	Badurtali	7	3	604	0.080
Waterbody	9	Badurtali	7	3	617	0.135
Waterbody	9	Badurtali	7	3	604	0.135
Waterbody	9	Badurtali	7	3	604	0.164
Waterbody	9	Badurtali	7	3	603	0.093
Waterbody	9	Badurtali	7	3	604	0.057
Waterbody	9	Badurtali	7	3	603	0.057
Waterbody	9	Badurtali	7	3	617	0.135
Waterbody	9	Badurtali	7	3	604	0.135
Waterbody	9	Badurtali	7	3	603	0.135
Waterbody	9	Badurtali	7	3	617	0.519
Waterbody	9	Badurtali	7	3	604	0.519
Waterbody	9	Badurtali	7	3	682	0.072
Waterbody	9	Khepupara	6	3	1029	0.001
Waterbody	9	Badurtali	7	3	994	1.129
Waterbody	9	Badurtali	7	3	720	1.129
Waterbody	9	Badurtali	7	3	993	1.129
Waterbody	9	Badurtali	7	3	719	1.129
Waterbody	9	Badurtali	7	3	670	1.129
Waterbody	9	Badurtali	7	3	815	1.129
Waterbody	9	Badurtali	7	3	814	1.129
Waterbody	9	Badurtali	7	3	816	1.129
Waterbody	9	Badurtali	7	3	761	0.070
Waterbody	9	Badurtali	7	3	767	0.070
Waterbody	9	Badurtali	7	3	768	0.070
Waterbody	9	Badurtali	7	3	815	0.019
Waterbody	9	Badurtali	7	3	699	0.001
Waterbody	9	Badurtali	7	3	690	0.001
Waterbody	9	Badurtali	7	3	675	0.001

Landuse	Ward No.	Mouza	JL	Sheet	Plot No.	Area (Acre)
Waterbody	9	Badurtali	7	3	689	0.001
Waterbody	9	Badurtali	7	3	678	0.001
Waterbody	9	Badurtali	7	3	677	0.001
Waterbody	9	Badurtali	7	3	676	0.001
Waterbody	9	Badurtali	7	3	683	0.001
Waterbody	9	Badurtali	7	3	992	0.000
Waterbody	9	Badurtali	7	3	781	0.000
Waterbody	9	Badurtali	7	3	719	0.000
Waterbody	9	Badurtali	7	3	641	0.000
Waterbody	9	Badurtali	7	3	726	0.059
Waterbody	9	Badurtali	7	3	723	0.059
Waterbody	9	Badurtali	7	3	670	0.059
Waterbody	9	Badurtali	7	3	735	0.002
Waterbody	9	Badurtali	7	3	735	0.002