



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

CHANDANAISH PAURASHAVA
MASTER PLAN: 2011-2031

SEPTEMBER, 2014

Technical Assistance: Local Government Engineering Department (LGED)



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

CHANDANAISH PAURASHAVA MASTER PLAN: 2011-2031

STRUCTURE PLAN

URBAN AREA PLAN:

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

WARD ACTION PLAN

SEPTEMBER, 2014



CHANDANAISH PAURASHAVA
CHANDANAISH, CHITTAGONG

CHANDANAISH PAURASHAVA MASTER PLAN: 2011-2031

Published by:

CHANDANAISH PAURASHAVA

**Supported by Upazila Towns Infrastructure Development Project (UTIDP) of
Local Government Engineering Department (LGED) under
Local Government Division**

Consultant:

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Suite: 1201, Level: 12, Hasan Holdings

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Printed By:

TROYEE associates

Suite: 1201, Level: 12, Hasan Holdings

52/1, New Eskaton Road, Dhaka-1000, Bangladesh

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Local Government Division (LGD),

Ministry of Local Government, Rural Development & Cooperatives

First Edition: September, 2014

Price: BDT 1500.00

USD 20.00

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, Chandanaish 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 Chandanaish Paurashava.

Master Plan of Chandanaish Paurashava has been prepared following the pre-requisite of the Local Government (Paurashava) Act, 2009. To prepare the Master Plan, LGED engaged consulting firm named Development Design Consultant Ltd. and set up a Project Management Office (PMO) deploying a Project Director, Deputy Project Director, experienced Urban Planners as Individual Consultant and support staffs. Regular monitoring, evaluation and feedback from PMO had also accelerate the pace and quality of the master plan preparation tasks. During formulation of the Master Plan, the Paurashava authority along with the project & 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 Chandanaish 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 Chandanaish Paurashava will be necessary to implement this Master Plan successfully and make this Paurashava developed and livable. I hope Chandanaish Paurashava will be a model Paurashava in Bangladesh through building itself green and sustainable by successful implementation of this Master Plan.

(Mohammad Ayub)
Mayor
Chandanaish Paurashava

EXECUTIVE SUMMARY

The Plan package prepared under the Project titled “Upazila Town Infrastructure Development Project”. The aim of preparing Master Plans for the Pourashavas located at the Upazila Headquarters is to promote infrastructural facilities needed for overall socio-economic and physical development. Consequently, it is expected that the living conditions of the inhabitants in the respective Pourashava will improve.

The main purpose of preparing Master Plan of Chandanaish Pourashava is to prepare Land use plan as envisaged in the term of Reference (ToR). The Chandanaish Pourashava is located in the Southern-western region of Bangladesh. The Pourashava consists of 9 wards which comprise 18.92 sq.km (4676.46 acre). This is a ‘B’ Category Pourashava.

The Plan Package comprised of three components: Structure Plan, Urban Area Plan and Ward Action Plan. First Component-Structure Plan basically concerned with 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. The process includes studies on future growth potentials of the areas/regions. It also identifies the basic strategic options available to accommodate the anticipated growth and after making synthesis preferred strategic options are accepted.

This preferred strategy then identifies spatial and other structural issues relating to the overall development of the Pourashava. 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 of the plan package is the Urban Area Plan, provides an interim mid-term strategy for 10 years (2011-2021) for the development of the Pourashava following the broad guidelines set by the longer term structure plan. It portray preferred development pattern, showing location of roads, infrastructure, community facilities and land use zones. Considering the development growth trends, an estimated growth rate for Chandanaish Pourashava has been fixed at 1.5 % using Exponential formula. According to this growth rate, population of Chandanaish Pourashava would be about 101,498 by the year 2031. Urban Area Plan is comprised of four components that are 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 of Chandanaish Pourashava. Total 21 categories of landuse zones have been identified in Chandanaish. Relevant land development control regulations and necessary implementation guidelines have also been incorporated.

Transportation and Traffic Management Plan identifies the location for new major transport corridors within Pourashava area considering Regional and local need. Traffic Volume Projection up to 2031 is the main basis of all plan proposals. Four types of Road Hierarchy, Space allocation at ROW, Provision of Service lane, Pedestrian facilities and others relevant proposals are accommodated in this plan. Total 6.22% lands are proposed under road circulation.

Drainage and Environmental Management Plan is comprised of Drainage Network development and Environment Management of the Pourashava. Preservation of the natural drainage such as:

Chullo khal and Boromoti Khal is emphasized and total 83.74 km drainage network is proposed. Besides, Landfill System for Solid Waste Management System is proposed to be developed for ensuring environmental sensitivity. Total 6 Waste Transfer Stations and 1 Solid Waste Disposal Site is proposed to be developed.

The Third component is Ward Action Plan (WAP) where ward wise priority schemes, phasing of the schemes is made. Considering population, distance and suitable land, most of the urban social services will be available to citizens within 1-2 km range. Third Component of plan package is the Ward Action Plan that is prepared for 9 wards separately. Ward Action plan mainly comprised of no. of community facilities, educational facilities such as: Primary School, Secondary School, College, Commercial facilities such as: Super Market, Neighborhood Market, corner shops etc. In Ward no. 9 and 7 total 69.3 acres has been proposed for private housing and around 5 acre land has been proposed for super market in ward no. 2 and 9. A Central Park is proposed in Ward no. 4 of 27.7 acres. Besides, total 6.66 acre land area posses 6 ward office.

It is suggested to follow up the plan proposals and recommendations of different sectors by keeping balance with demand and supply of citizens' requirements. It should be kept in mind that master plan is a guideline for development and control of growth in a systematic manner. Without proper monitoring and supervision it would not be possible to execute the guide lines of Master Plan. However, appropriate authority must be obligatory for the execution of the Master Plan.

**Government of the People's Republic of Bangladesh
Local Government Engineering Department
Upazila Town Infrastructure Development Project (UTIDP)**

Master Plan of Chandanaish Paurashava

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LIST OF ABBREVIATIONS AND ACRONYMS

BADC	Bangladesh Agriculture Development Corporation
BM	Bench Mark
BRDB	Bangladesh Rural Development Board
BRTA	Bangladesh Road Transport Authority
BRTC	Bangladesh Road Transport Corporation
BTM	Bangladesh Transverse Mercator
CBD	Central Business District
CNG	Compressed Natural Gas
CP	Control Point
dBase	Data Base
DEM	Digital Elevation Model
DGPS	Differential Global Positioning System
DLRS	Directorate of Land Records and Survey
DPA	Demarcation of Planning Area
DPHE	Department of Public Health and Engineering
GCP	Ground Control Point
GIS	Geographic Information System
GPS	Global positioning system
HQ	Head Quarter
K.P.H	Kilometers Per Hour
K.M.	Kilometer
LGED	Local Government Engineering Department
mPWD	Meter PWD
MSL	Mean Sea Level
O-D	Origin and destination Survey
PCU	Passenger Car Unit
PRSP	Poverty Reduction Strategy Paper
PWD	Public Works Department
RCC	Reinforced Cement Concrete
RDMS	Relational Data Management System
REB	Rural Electrification Board
RHD	Roads and Highway Department
RS	Revenue Survey
RTK-GPS	Real Time Kinematics Global Positioning System
SOB	Survey of Bangladesh
SP	Structure Plan
SQL	Structural Query Language
TCP	Temporary Control Points
TIN	Triangular Irregular Network
TS	Total Station
TVS	Traffic Volume Survey
UAP	Urban Area Plan

UP	Union Parishad
UTIDP	Upazila Towns Infrastructure Development Project
WAP	Ward Action Plan

LIST OF LOCAL TERMS

Bazar	Market
Ghat	Boat Terminal
Hat	Weekly and Occasional Market
Katcha Bazar	Kitchen Market
Katcha	Non-permanent
Khal	Canal
Mondir	Temple
More	InterChapter
Mouza	Land Measurement Unit
Paurashava	Municipality
Pucca	Permanent Structure
Semi-pucca	Semi-permanent
Shahar	Town
Tempo	Human hawler

LIST OF TECHNICAL TERMS

Acre	1 ² km = 247.1044 acre
Katha	1 Katha = 720 sq. ft.
Lakh	1 Lakh = 100 Thousand

Introduction

Bangladesh shows rapid increase in its urban population. The average growth rate of population between 1961-1980 was 8 percent. This rate is reduced to 6 percent during the period 1981-1990. Although the growth rate of urban population is on the decline this rate may not go below 4 percent by the year 2010. According to the population census of 2001 at present about 23.39 percent of the total population of the country or about 29 million people live in the urban areas. As per demand of people the transformation of important urban areas into Pourashavas is continuing to ensure planned development of Pourashavas and the total number of Pourashavas now stands nearly 318. Out of these 318 pourashavas a total of 223 pourashavas and Kuakata Tourism Center development programme is undertaken in Upazila Towns Infrastructure Development Project.

The development scenery of the pourashava shows a very grave situation. The main and secondary drains and natural streams in the Upazila Towns do not function as an integrated drainage system due partly to silting up and unplanned and deficient construction and lack of maintenance. Encroachment on drainage reservations causes inundation to many areas, including houses and roads, during heavy storms. There is hardly any roadside drain. And if any, the roadside drains are inadequate due to insufficient capacities and incorrect gradients. Equally, the traffic and transportation problems in urban areas in Bangladesh have been continuously increasing as the development and management of road network has not been commensurate with the increasing demand for its usage. Traffic congestion, delay, accidents, pedestrian and parking difficulties, air and noise pollution are among the problems. Traffic congestion is one of the most important and critical problems now being identified in the urban areas. The situation has been steadily deteriorating over time, over large areas and for longer periods of the day. If this unplanned construction goes on unabated it will make the environment of Upazila level Pourashava unsuitable and inhabitable. At present there has no proper Master Plan for development of pourashava. In the absence of proper Master Plan, construction of all types of infrastructure like houses, roads, drains, markets are going on unabated in an unplanned pattern. This situation is creating an adverse milieu in the original landscape thereby creating environmental hazards. In view of this grave situation it has, therefore, been contemplated that preparation or updating of existing Master Plans of 223 Upazila town and Kuakata Tourism Center will be made with projection for a period of 20 years. Further, Further, in support of the Master Plan there will be separate plans for Structure Plan, Urban Area Plan (Landuse Plan, Drainage and Environmental Master Plan, Traffic Management Plan, Plan for Urban Services) and Ward Action Plan to ensure operation and maintenance of the existing infrastructure along with those facilities proposed to be built up under the future investment programme and above all, to suggest improvement of the management ability of the Chandanaish Pourashava so that their revenue earning capability is enhanced with a view to building up the Chandanaish Pourashava as self-sustaining local government institutions. Basically the Master Plan/ UAP will be an interpretation of the structure plan over the medium term (10 years). The coverage of the Master Plan/ Urban Area Plan will be 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 20 years. Delineation of the Master Plan Area should be based on the urban growth area as identified in the Structure Plan.

Structure Plan is basically concerned with formulation of broad policies for managing and promoting efficient urban development over the medium and long term and attempts to integrate economic, physical and environmental objectives. Thus a Structure Plan provides a broad

framework for development activities over a long period of time in and around the cities. A broad structure of the project area, places where growth is likely to take place and preferred areas of future expansion is indicated in the structure plan.

1.1 Objectives of the Master Plan

Broad objectives and vision for the preparation of Master Plan of Chandanaish Pourashava are to

- Determination of present and future functional structure of the Pourashava
- Determination of mechanism for improving and guiding development
- Review of existing problems and proposed initiatives
- Formulation of bankable projects and
- Increasing capacity of local authorities for management.

As prescribed in the ToR, objectives of the Pourashava Master Plan are as follows:

- Find out development issues and potential of the Pourashava and make a 20-year development vision for the Pourashava and prepared a Master Plan in line with the vision for the development.
- Plan for the people of the Chandanaish Pourashava to develop and update provisions for better transport network, housing, infrastructures for roads, markets, bus terminals, sanitation, water supply, drainage, solid waste management, electricity, education, leisure and such other infrastructure facilities for meeting the social and community needs of the people for better quality of life.
- Prepare a multi-sector short and long-term investment plan through participatory process for better living standards by identifying area-based priority like Drainage Plan, Transportation and Traffic Management Plan, other need specific plan as per requirement in accordance with the principle of sustainability.
- Provide controls for private sector development, clarity and security with regard to future development.
- Provide guidelines for development considering the opportunity and constraints of future development of the Pourashava.
- Prepare 20 years Master Plan to be used as a tool to ensure and promote growth of the Pourashava in line with the guiding principles of the Master Plan and control any unplanned growth by any private and public organization.
- One of the objectives of this project is to prepare a comprehensive set of Plans for development of Chandanaish Pourashava. Accordingly the Plan comprises a set of policies including a broad framework for development promotion, control and coordination.

For the plan preparation of Chandanaish Pourashava, following objectives have been considered:

Discouraging Migrated Settlements and Physical Growth of the Pourashava

Chandanaish Pourashava is a potential Pourashava in its national and regional context. Chandanaish Pourashava is important in the national context for some reasons. Chittagong-Cox's Bazar highway flows North to South at the east side of the pourashava that is the main road of Chandanaish Pourashava. Chandanaish Pourashava is a small urban centre in Chittagong Zila.

Due to its locational advantages through roads it has good potential for urban development. Most of the economic activities and establishment are developed on this Road. Chandanaish has good marketing and transportation network with Dhaka, Chittagong, Cox's Bazar, Bandarban Zila. It is also have good network with Anowara, Boalkhali, Patiya, Rangunia, Chandgaon & Kotwali, Double Mooring and Bandar Thanas of Chittagong Zila. Physical growth of the Pourashava is a common feature. Besides, population of the pourashava is increasing due to internal migration among upazilas of Chittagong district and particularly influx of Rohingya push-in from Myanmar through the greater Chittagong division. Development of Chandanaish Pourashava mainly depends on the future road pattern and urban services. The future urban growth of the pourashava might be developed further along with the Chittagong-Cox's Bazar highway.

Managing Economic Activity Expected in Future

Rise of the existing population combined with rapid development of Chittagong division and net immigration from Myanmar and other areas suggests a population growth rate of 1.50 per year. On an average about 582 populations per year will be added to the population of the planning area in next 20 years. If the economy flourishes at the same rate that can support this population, then additional employments will need to be created yearly for the same period. If policies geared to decentralizing urban development from Dhaka and other major cities are introduced and successfully implemented, then the pourashava is likely to experience even higher rates of growth. Land and infrastructure need to be made available to cater for these levels of growth. Availability of land for urban development is an opportunity but agriculture development will be reduced in greater context and that hamper food security. The critical issue is the rate at which land will be converted from improved agricultural state to build homes, work places and other buildings. Priority needs to be given to increase the rate at which serviced land is made available for physical development purposes.

Extending the provision of services and facilities

Services and facilities required in Chandanaish Pourashava are already far greater than the resources available with the pourashava. Expected future growth of population and economic activity will exacerbate this situation. Given the scarcity of financial resources, priority also needs to be given it identifying and introducing low cost methods of supplying services and facilities and identifying and introducing methods of provision which make less of a demand on the resources of Government.

Improve Decision-making related to funding of services and facilities

Due to the shortage of resources available with the pourashava, principal task faced by the authority is, to decide which services and facilities are to be given funding and which groups of the population will be benefited. This will require co-ordination and co-operation between different agencies providing services and facilities in the Pourashava. It will also require an informed picture of what the existing supply situation is, as well as the need. In relation to need, it will also be necessary to understand how this is likely to change in the future.

Environmental Considerations into account in making Decisions related to Physical Development

Certain activities, mainly those associated with manufacturing processes, have adverse environmental impacts. It is important that due consideration is given to environmental issues. An environmental problem, once established, is often expensive and difficult to rectify.

1.2 Approaches & Methodology

Different approaches and methodologies were followed for the preparation of Structure Plan, Urban Area Plan and Ward Action Plan. Different methods were followed in different steps from mobilization for the project to finalization of the plan. Collection of mouza maps and secondary documents, different surveys, preparation of base-map and GIS database, consultation with stakeholders, fixation of planning standard and proper documentation are the key methodologies. Draft Structure Plan as well as urban area plan and ward action plan were prepared based on the prepared planning standard and finalizing different proposition for the development proposal of Chandanaish Pourashava and formulating future strategies for the planning area of Chandanaish Pourashava. Detail discussion of approaches and methodologies related with the preparation of Structure Plan, Urban Area Plan including Land Use Plan, Transportation and Traffic Management Plan, Drainage and Environmental Plan and Ward Action Plan for Chandanaish Pourashava set-forth in the following paragraphs.

Phase 1: A reconnaissance survey and preliminary visit were made by the team of consultants to acquire basic idea about the Chandanaish Pourashava areas to be planned. The goal in this step was to conceptualize the planning process and the operational activities. In the next phasing of work, an Inception Seminar was organized at the Chandanaish Pourashava in which Pourashava authority with other stakeholders was informed about the scope and Terms of Reference for the preparation of Master Plan and the output in this step was the preparation of an Inception Report.

Phase 2: Planning area for the preparation of 20 years development plan in consultation with pourashava Mayor and Councilors were demarcated based on existing condition, demand of Chandanaish Pourashava and potential scope for future development. Methodologies involved in the process of establishment of Bench Marks (BM) and demarcation of existing pourashava boundary and proposed planning area for Chandanaish Pourashava are as follows:

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

Phase 3: Detailed Survey for Chandanaish Pourashava was administered following the advance technique according to ToR and a number of studies were conducted in order to prepare a database and get an insight into the existing conditions. The studies, however, have focused on three different but inter-related aspects; the physical condition of the town, the economic and social conditions of the people, and their perceptions about the problems and prospects of the

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

Total station based advanced technology for topographic, physical features; land use surveys done along with household sample survey for socio-economic information were used in the study. The Physical Feature Surveys were conducted covering the entire area under the jurisdiction of Chandanaish Pourashava. The stepwise works for survey and mapping are as follows.

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

All these information were collected using the modern survey equipments (i.e. Total Station, RTK-GPS, etc.). To collect the topographic information, RTK-GPS and Total Station (TS) were used as advanced survey techniques as per ToR. The following variables were measured in topographic survey:

Land level/spot level at an interval of 50m in general cases but for high undulated areas this regular interval were decreased as necessary. Alignment and crest levels (not exceeding 50m) of road, embankment and drainage divides were also considered during taking spot levels.

Contour map was prepared using 0.3m contour interval. Besides, alignment of rivers, lakes, canals drainage channels and outline of bazaars, water body, swamps etc. were also recorded in the physical feature survey. Land use survey covered different uses of land i.e. agricultural, residential, commercial, industrial, community services, educational, transport and communication, water body, vacant land and circulation network etc.

Land Use Surveys were conducted by recording the current use of the land within the project area. Physical feature survey data and maps were used as the basis for land use survey. The drainage information was primarily collected from the topographic and physical feature surveys. Some

additional information has also been collected through key Informant Survey of knowledgeable personal of the Pourashava using an unstructured questionnaire.

Socio-economic survey data on population, family size, distribution of age/sex, occupation, household structure, dwelling occupancy, migration pattern, education status, Income and expenditure level, land ownership pattern, land value, health facilities, recreational facilities etc. were collected. Detailed traffic and transportation survey was conducted through traffic volume survey, origin destination (O-D) survey and speed survey, Congestion point, inventory of road networks etc.

Phase 4: After conducting all sorts of survey, survey data of the planning area were processed and analyzed and base maps were prepared by the consultant incorporating all the natural features and man-made infrastructures along with their alignment and essential attribute. The final outcome of this phase is the preparation of survey report which illustrates the components of survey in order to understand the existing condition of the project area.

Phase 5: Preparation of Interim Report is an intermediary phase towards preparation of Master Plan for Chandanaish Pourashava which involves projection of population and land use and demand for housing, thorough review of existing policies relevant to different development sectors, assessment of institutional capacity of the Pourashava. An overview of recent past budget and the list of existing/recent past infrastructure related development schemes undertaken by the Pourashava have also been reviewed at this phase to get an idea of financial capacity of the Pourashava Authority.

Phase 6: This phase involves analysis and Projection of existing and future condition considering existing trend of growth, BBS data and other primary and secondary data relevant to the project area and projection of future requirement through assessing the growth direction, planning standards provided by LGED and the projected population for the planning period.

Phase 7: Public The eighth phase is to conduct 'Public Consultation Meeting' where discussion on existing facilities and services, future requirements, identification of proposals on maps and field verification have been conducted for the preparation of Draft Master Plan. The proposals have been finalized after conforming and incorporating the views and ideas of the stakeholders.

Phase 8: The ninth phase of the methodology is 'Preparation of Draft Master Plan Report'. This portion of the methodology is directly linked with three different issues, which are – Structure Plan, Urban Area Plan and Ward Action Plan.

Structure Plan

The Structure Plan is composed of a report and a map of **1:9000** scale (fit to scale) where the plan indicate the magnitude and direction of future growth of Chandanaish Pourashava with a aimed to provide a long term strategy upto the year 2031. The Structure Plan draws strategic options for future development of Chandanaish Pourashva considering 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 of 20 years. The Structure Plan of Chandanaish Pourashva covers an area of about 18.92 sq.km.

Urban Area Plan

The Urban Area Plan (UAP) is prepared for managing and promoting development over medium term (10 years) and is formulated to serve the area as a guide for development together with the

control of land use of the planning area. The UAP is an elaborated report than the structure plan along with sectoral development proposals and a land use zoning map with a mouza map in the background. Urban Area Plan of Chandanaish Pourashava is comprised of Land Use Plan, Transportation and Traffic Management Plan, Drainage and Environmental Management Plan and Plan for Urban Services covering an area of about 18.92 sq.km.

Ward Action Plan

Ward Action Plan (WAP) are a series of detailed spatial development plan and also termed as short-term plan of 5 years. Individual Ward of the Pourashava is deserved scope of this plan. In the Pourashava, 9 Ward Action Plan is being prepared. The WAP have been formulated for execution in a period of 5 years with a review of the existing situation of the Ward in respect to land use, community facilities, public services, utilities, infrastructures, etc.

1.3 Scope of Work

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

- Visit the Pourashava included under the package work and list the passive name of Pourashava that will undertake preparation of Master Plan. In case if any Pourashava has already prepared Master Plan it has no need for Pourashava of Master Plan then it will be excluded from the package, written opinion of the concerned Chairman of the Pourashava whether or not Master plan Preparation will be included. A copy of list of Pourashavas feasible for preparation of Master Plan will be submitted to the office of the PD, UTIDP.
- Organize an inception Seminar at the Pourashava level and inform of the Pourashava about the scope and terms of reference for the preparation of Master Plan. Make a thorough investigation and based on potential scope and opportunities available in the Pourashava develop a 20 years development vision for the Pourashava liking the ideas and view of the Pourashava.
- Determine the study area based on existing condition, demand of the Pourashava and potential scope for future development. Carry out detailed socio-economic, demographic and topographic survey of the Pourashava area following approved format of PMO, UTIDP and associated data were collected from primary and secondary sources. Analyze such data and information, find out possible area of intervention to forecast future population of Chandanaish Pourashava (20 years), vis-a-vis assess their requirement for different services, physical and social infrastructure facilities, employment generation, housing right of way and land requirement for the existing and proposed roads, drains, play grounds, recreation centers and other environmental and social infrastructure.
- Identify and investigate the existing natural and manmade drains, natural river system, assess the extent and frequency of flood, determine area of intervention. Study the contour and topographic map produced by the relevant agencies and also review any previous Drainage Master plan available for the Pourashava.
- Prepare a comprehensive (storm water) Drainage master plan for a plan period of 20 years. In such exercise, consider all relevant issues including discharge calculation, catchment area, design of main and secondary drains along with their sizes, types and

gradients and retention areas with primary cost estimates for the proposed drainage system.

- Recommend Planning, institution and legal mechanism to ensure provision of adequate land for the establishment of proper right of way of (storm water) drainage system in the Pourashava.
- Collect and assess the essential data relating to existing transport, land use Plan, relevant regional and natural highway development plan, accident statistics, number and type of vehicle registered of each Pourashava.
- Assess requirements of critical data and collect data through reconnaissance and traffic survey, which should estimate present traffic volume, forecast the future traffic growth, identification travel pattern, areas of traffic conflict and their underlying cause.
- Study the viability of different solution for traffic management and develop a practical short term traffic management plan, including one way systems, restricted access for large vehicles, improved signal system traffic islands, roundabouts, pedestrians crossing, deceleration lanes for turning traffic, suitable turning radius, parking policies and separation of pedestrians and rickshaws etc.
- Assess the non-pedestrian traffic movements that are dominated by cycle rickshaw. Special recommendations should be made of as to how best to utilize this form to transport without causing unnecessary to other vehicles. Proposal should also consider pedestrians and their safety, with special children.
- Assess the current land use with regard to road transportation, bus & truck station, railway station etc, and recommend action to optimize this land use.
- Prepare a road network plan based on topographic and base map prepared under the project. Recommend road development standards, which will serve as a guide for the long and short term implementation of road. Also suggest Traffic and transportation management plan and also suggest a traffic enforcement measure to be taken.
- Prepare the Master Plan with all the suitable intervention, supported by appropriate strategic policy, outline framework, institutional arrangement and possible source of fund for effective implementation of the plan.
- Prepare a plan to set out proposed Master Plan at 3-levels namely Structure Plan, Urban Area plan and Ward Action Plan.
- Work out and framing strategies and policies for the preparation of a structure plan for each Pourashavas under the package. as a follow up of Structure Plan to prepare a Urban Area Plan consisting a Land use Plan. Transportation and Traffic Management Plan, Drainage and Environment Management Plan and Ward Action plan.
- Make a total list of primary and secondary roads, drains, and other social infrastructures for each Pourashava for a plan period of 20 years. Examine and classify according to the existing condition, propose long, medium and short-term plan and estimate cost for improvement of the drain and alignment and other infrastructures.
- In line with the proposed Master plan propose a Word Action Plan with list of Priority schemes for the development of roads, drain, traffic management and other social infrastructures for implementation during the first five years of the plan period.

- Organize at least 2 public consultation meeting/ seminar with the help of concerned Pourashava of which one for discussion on interim report and the other on draft final Report on the proposed Master plan. Integrate beneficiary's point of view in the plan with utmost careful consideration.
- Prepare and submit Master plan and Report with required standards as required by the TOR.

1.4 Content and Organization of the Master Plan Report

Introduction describes the ToR of the concerned project and background, objectives of the Master Plan, approaches and methodologies, scope and organization of the report are described in the introductory chapter. The Master Plan is organized in three major parts which are as underneath.

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

PART– B: Urban Area Plan includes

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

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

Chapter 1 to Chapter 9 of Part A discusses the different component of the structure plan, which are further illustrated in the content and form of structure plan under the Chapter one of Part A.

Chapter 1 of Landuse Plan under Part B mainly focuses on the existing and projected landuse and Landuse proposals including master plan implementation strategy.

Chapter 2 of Traffic Management Plan under Part B illustrated about Transportation and Traffic Management Plan covering the scope of improvement of the existing network and system and plan proposals for new development. The proposals on improvement and new development are made for the project area up to 2031. The Chapter also provides the purpose and the role of Transportation and Traffic Management Plan and its relation with Structure Plan and Land Use Plan.

Chapter 3 of Drainage and Environment Management Plan under Part B states about the inventory of the existing drainage system of Teknaf Pourashava has been made as a part of the comprehensive topographical survey to be taken-up under this project. Also describe the drainage and environmental management plan, and its implementation strategies. In addition, Chapter 4 under Part B describes the Plan for Urban Services.

Chapter 1 to Chapter 5, particularly 3.1 to 3.9 of Chapter 3 of Ward Action Plan under Part C reveals the detailed plan of ward wise proposed development proposals.



PART-A
STRUCTURE PLAN

Part A: Structure Plan

Chapter 1: Introduction

Chandanaish Pourashava established on June 26, 2002. The Pourashava consists of 9 wards, 9 mahallas and 6 mouza containing total 12 sheets fully and partially. Chandanaish Pourashava at Chandanaish Upazila in the Chittagong Zila includes an area of 18.92 sq km is bounded on the north by Patiya and Rangunia upazilas, on the east by Bandarban sadar upazila of Bandarban district, on the south by Satkania upazila and on the west by Anowara upazila (*Map 1.1*).

The development scenery of the pourashava shows a very grave situation. Growth direction indicates that substantial development is taking place in the central area on Chandanaish Upazila Mor and College mor at Dhaka-Chittagong-Cox's Bazar highway. Development pressure is also high at the surrounding areas of Bazar Area. The main and secondary drains and natural streams in the Upazila Towns do not function as an integrated drainage system due partly to silting up and unplanned and deficient construction and lack of maintenance. Encroachment on drainage reservations causes inundation to many areas, including houses and roads, during heavy storms. There is hardly any roadside drain. And if any, the roadside drains are inadequate due to insufficient capacities and incorrect gradients.

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

1.1 Background of the Pourashava

Chandanaish Pourashava established on June 26, 2002 with an area of 18.92 sq km, bounded on the north by Patiya and Rangunia upazilas, on the east by Bandarban sadar upazila of Bandarban district, on the south by Satkania upazila and on the west by Anowara upazila. There is no river within the Pourashava or its adjacent area. Most notable khals are Boromoti khal and Chullo khal within the Pourashava. It comprises of wards, 9 mahallas and 6 mouza containing total 12 sheets fully and partially.

The Pourashava is located between 22°08' and 22°02' north latitude and between 91°49' and 92°09' east longitudes. It is situated to the south-east of Chittagong district and about 40 km away from the district town of Chittagong. The Arakan road (Chittagong - Cox's Bazar road) passing through the east side of the Pourashava acts as a major road.

1.2 Philosophy of the Master Plan

The word “Master Plan” is by default used to a local or regional Plan which defines plot-by-plot land according to its use. This type of plan has a time limitation, i.e. for long term development decisions. Such Plans are found not very practical now a days. For last five to six decades the world economy and politics is undergoing through a process of changes which is very fast and unpredictable. By recognizing this changed phenomenon, theories in the realm of Urban Planning also went through a fundamental shift. Long term plans for urban area shifted its strategy from producing typical land use based “Master Plan” towards a set of Plans: namely Structure Plan, Urban Area Plan and Detailed Area Plan/ Ward Action Plan.

1.3 Vision & Objectives of the Structure Plan

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

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

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

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

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

indication of important physical infrastructure; and b) setting out policy recommendations for future development. According to the Terms of Reference, the objectives of Chandanaish Pourashava Structure Plan are:

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

1.4 Methodology

Different approaches and methodologies were followed for the preparation of Structure Plan, Urban Area Plan and Ward Action Plan. Different methods were followed in different steps from mobilization for the project to finalization of the plan. Collection of mouza maps and secondary documents, different surveys, preparation of base-map and GIS database, consultation with stakeholders, fixation of planning standard and proper documentation are the key methodologies. Draft Structure Plan as well as urban area plan and ward action plan were prepared based on the prepared planning standard and finalizing different proposition for the development proposal of Chandanaish Pourashava and formulating future strategies for the planning area of Chandanaish Pourashava. Detail discussion of approaches and methodologies set-forth in the following paragraphs.

Structure Plan

The Structure Plan is composed of a report and a map of **1:9000** scale (fit to scale) where the plan indicate the magnitude and direction of future growth of Chandanaish Pourashava with a aimed to provide a long term strategy upto the year 2031 (*ANNEX-10A*). The Structure Plan draws strategic options for future development of Chandanaish Pourashava considering 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 of 20 years. The Structure Plan of Chandanaish Pourashava covers an area of about 18.92 sq.km.

Table-1.1: Basic Information of the Structure Plan area (as planning area also)

Year	Demographic Characteristics				
	Area (sq km)	Area (Acre)	Population	Gross density/ sq.km	Gross density/ Acre
2011	18.92	4676.46	75,359	3983	16
2031	18.92	4676.46	101,498	5365	22

Source: Bangladesh Population Census, 2001 and estimated by the Consultant.

1.5 Surveys Performed

The Master Plan is prepared based on the survey data. Most of the information provided in the Survey Report is the outcome of the surveys namely Topographical Survey, Physical feature survey, Landuse survey, Socio-economic survey, Transport survey and Drainage and Environment survey.

Landuse Survey

Landuse survey basically records the use of land by its functional activity such as residential, industrial, commercial, health, cultural, etc. During the TS and DGPS based physical feature survey each feature was recorded with individual ID or code representing their use. At the same time, uses of lands without structures were coded on mouza plots. Later on landuse features was identified and classified using the recorded code and separated in different layers during data processing stage, from where the category-wise landuse map has prepared using the identification layers of each landuse features. The landuse map has prepared indicating the broad categories of landuse described in the ToR. The landuse map has prepared on RS Mouza map at scale 1"=165' (RF 1:1980).

Physical Features Survey

Physical Features were surveyed using both Total Station (TS) and Differential Global Positioning System (DGPS) survey technique. All structures and installations were surveyed by TS and alignment and closed boundaries like Road, River, Khal, Marshland, Homestead, Large Water bodies etc. have surveyed by DGPS. Where DGPS survey was not possible for weak satellite signal due to obstruction, TS survey technique was applied for those particular areas.

Location and dimension of the physical feature has surveyed and stored using Real Time Kinematic Global Positioning System (RTK-GPS) supported TS and DGPS survey technique. Data was recorded in the TS and DGPS memory with separate ID or code number for each feature (as Line, Point and Polygon). Later on the TS and DGPS data was transferred directly to the Geographic Information System (GIS) database where the feature was kept in separate layer wise as per specified code or ID. Names of settlements, village, rivers, khals, lakes, roads, markets, etc. were recorded during physical feature survey. For supporting the TS Survey, huge numbers of Temporary Control Points (TCP) have established using RTK fast static survey technique and GEOID Model of the project. These TCPs were used by the TS groups as reference points (Station and Back Points) for physical feature, topographic and landuse survey.

Topographic Survey

Topographic survey has performed using TS and DGPS. The TS survey groups/teams were responsible for measurement of spot levels (Northing, Easting, Elevation or RL) for contour generation. In general the spot levels on the land have taken at an interval that represents the topography of the land surface. The utility poles and alignment of utility lines have surveyed using DGPS. The established TCPs with RTK-GPS were used by the TS groups as reference (Station

and Back Point). Contour map has prepared at scale suggested by LGED incorporating all physical features and infrastructures.

The Total Station (TS) survey groups were responsible for conducting topographic survey where Total Station (TS) is used for measurement of Land levels/spot levels (Northing, Easting, and Elevation in respect to mPWD datum) for contour generation at 0.3m intervals. In general the spot levels on the land were taken at not exceeding 50m intervals, closer spots were taken in case of rapid undulation. In addition to the Primary Bench Marks (BM) established by RTK-GPS Static survey, 120 nos. of Secondary Bench Marks/Control, Point (BM/SCP) were established using RTK fast static and 1st order BM carry survey for supporting the TS survey. These SCPs as well as the primary BMs were used for Total Station survey as reference points (Station and Back Points) both for topographic and physical feature surveys. The spot levels/land levels were transferred to GIS database and later by processing Digital Elevation Model (DEM) as well as contour map at 0.3m interval contours were generated using TIN (Triangular Irregular Network) Method of GIS.

Transport Survey

To perform transport survey, the team was mobilized on 6th April, 2009. An introduction meeting on 7th April, 2009 was held in Chandanaish Pourashava in presence of the Mayor, Councilors, Engineers, Local Elites, Stakeholders and other professional to identify the problems as well as to set the date and time of survey as well as to identify the survey stations.

The Pourashava authority recommended as local Hat day and as regular day to conduct transport survey. With reference to their observations, survey time was set from 7:30 AM to 8:30 PM for those two days when traffic movements were frequent.

In order to get an accurate scenario about the study roads / links, detailed frequency of traffic movement was analyzed. This work was considered overall traffic volumes and the proportion of different traffic. Frequency analysis of traffic was performed using the collected data from traffic volume survey. This survey was included mode-wise travel frequency on the specific road. So, that information helps to explain the variation in using of different vehicles for different time and day of that road.

Drainage Survey

Drainage channels were surveyed by Optical Level machine from the head of the channels to the outfall. 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 blockage or refuse was observed to accumulate in the bottom of the channel, the reason of such blockage was identified.

Environmental Survey

Environmental survey was conducted following the standard methods and procedures to determine environmental pollutions. Elements of pollutions of environment are air, water, land and noise for the development of urban areas. The Consultants have taken necessary assistance and information from the Pourashava Mayor, Councilors, Engineers and other concerned officials as well as the general inhabitants to determine pollution in air, water, land and noise. Based on the information and data collected from the field, detailed report has been prepared. Data collection format and questionnaire was approved by the PD of UTIDP, LGED.

Socio-Economic Survey

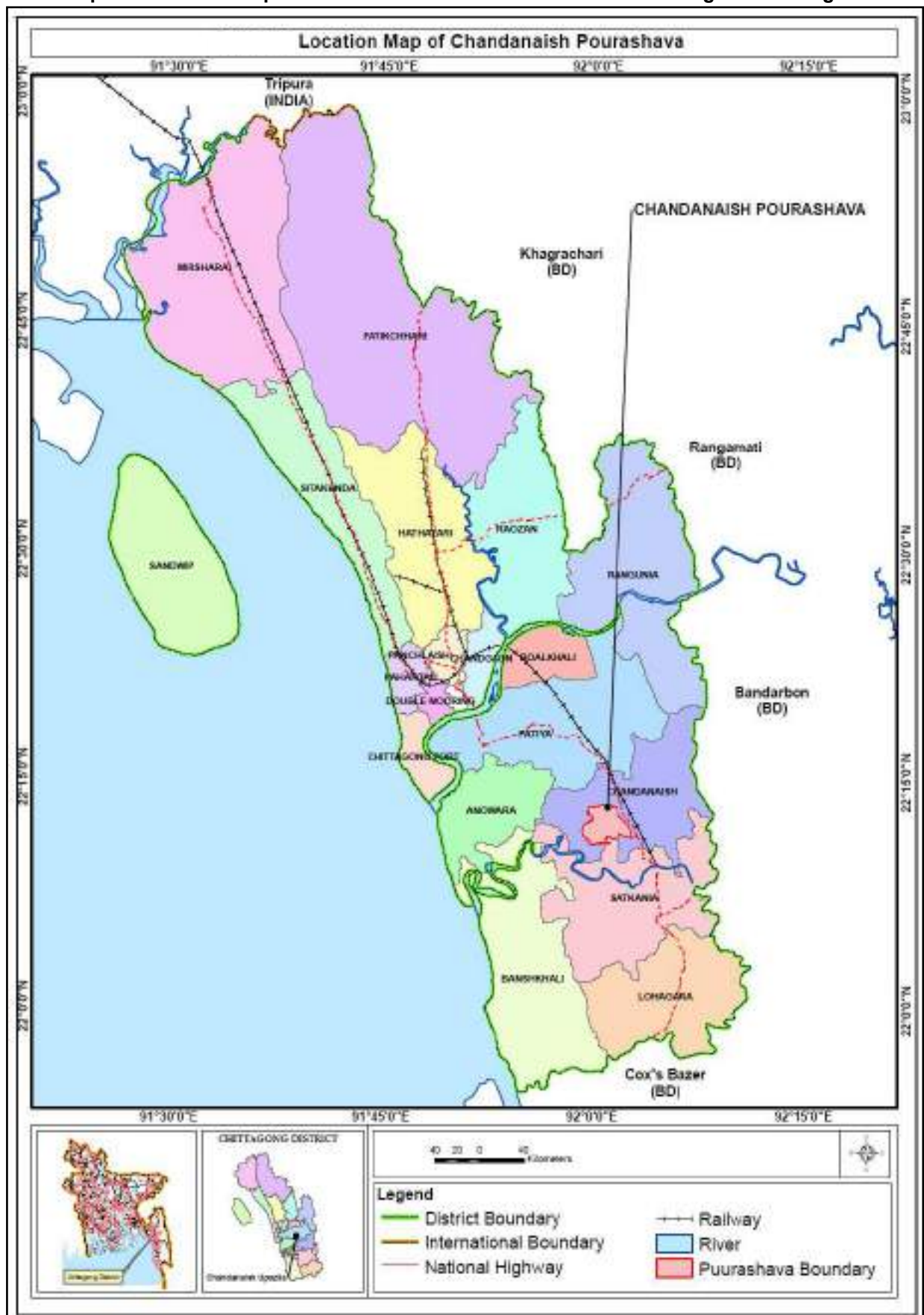
The Socio-economic survey has been conducted with the proposed methodology beginning from October '08 and ending in November '08. The Survey Team was composed with 5 field investigators assisted by Field Supervisor. The Supervisor has been seconded from Consultant's office. The survey took approximately three weeks to complete with a pre-determined set of questionnaire. The Pourashava is consisted with 9 Wards. The Socio-economic survey covers all the Wards. Those Wards are identified and distributed as the Core and Potential Core areas. In total, 5% sample households are considered from above each category of area and then again distributed into Pucca, Semi-Pucca, Katcha/ Thatched (Jhupri) households according to the respective Wards.

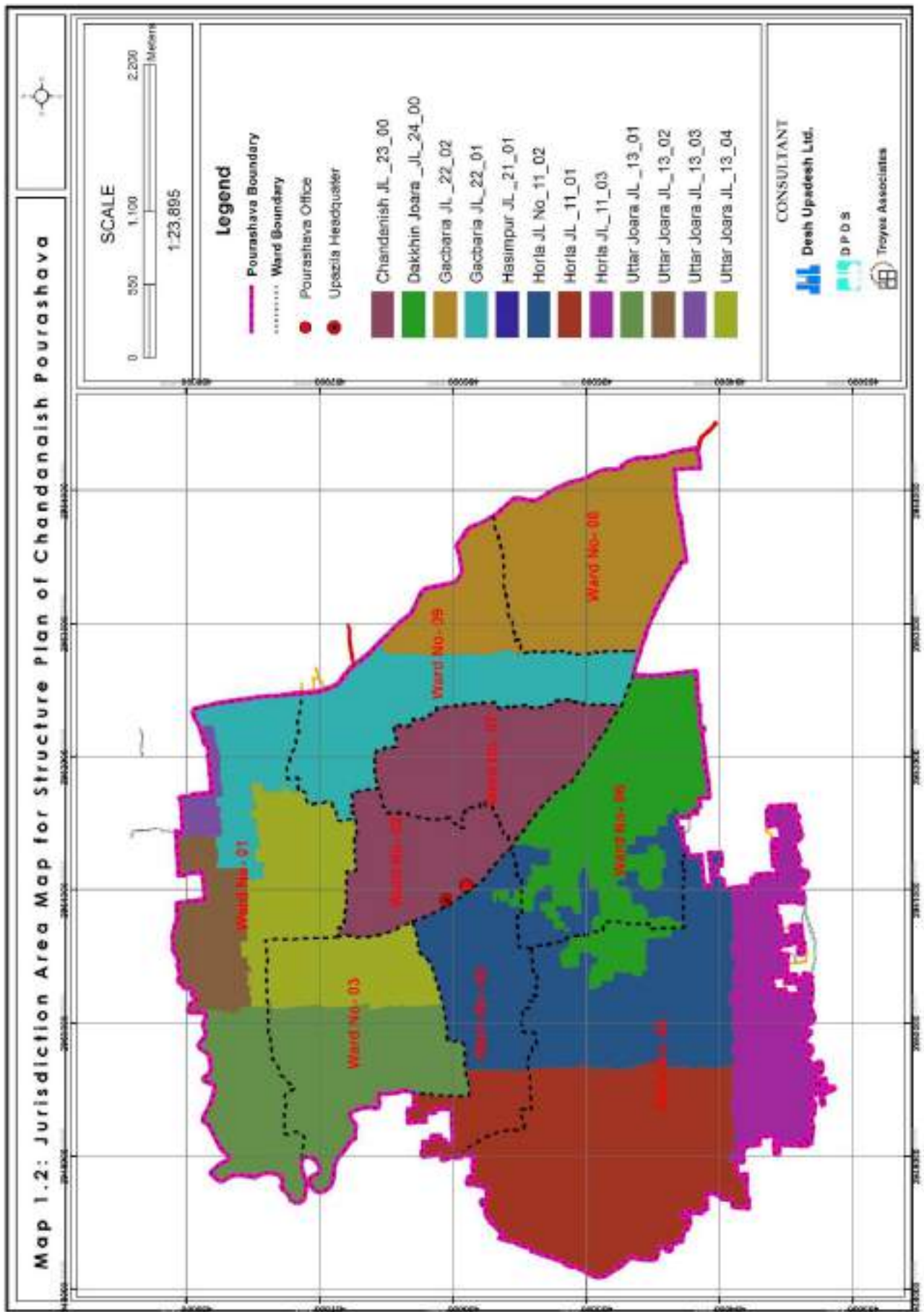
1.6 Content and Form of the Structure Plan

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

Structure Plan is basically concerned with development of broad strategies for managing and promoting efficient urban development over the long term and attempts to integrate economic, physical and environmental objectives. Thus Structure Plan provides a broad frame work for development activities over a long period of time in and around the Chandanaish Pourashava. The process includes studies on future growth potentials of the area/regions. It then identifies basic strategic options available to accommodate the anticipated growth. After evaluation the preferred strategic option is accepted. The preferred strategy then identifies spatial and other structural issues relating to the overall development of Chandanaish Pourashava Town. It also provides area-wise strategies for expansion of different urban activities in space. The Structure Plan also outlines major sectoral policies to guide development in the desired manner over a longer period of time. However, Chandanaish Structure Plan is focused primarily on the physical form and development pattern of the Pourashava Urban Center on the Maps and Reports that sets forth a basic framework, showing how Chandanaish Pourashava should grow and evolve over the next 20 years. It will serve as a blueprint towards the desired future described in the Vision & Goals.

Map 1.1: Location Map of Chandanaish Pourashava in context of Regional Settings





Chapter 2: Pourashava's Existing Trend of Growth

2.1 Social development

Chandanaish Pourashava exhibits very high potential of socio-economic development due to existence of high commercial activities. Chittagong-Cox's Bazar national highway passes through east side of the Pourashava. Due to the influence of proximity to Chittagong Sea Port and tourism city Cox's Bazar, new investment will be attracted around this pourashava which will create new job markets. This will enhance income of the local people and raise their standard of living.

Age-Sex Structure

Age-Sex composition of Chandanaish Pourashava revealed that 48.19% people are male and 51.81% people are female. It was also observed that a large number families comprise almost 29.09 percent of the sample population of the project area belong to 16-25 and 26-57 age group. The latter 6 to 25 age group covers 27.81 percent, while below 6 age groups cover 11.34 percent. On the other hand the percentage of people in the 26-57 age groups (economically active group) indicates that in the project area supply of labor force is quite substantial. The percentage of people in the 06-25 age groups indicates the requirement of academic institutions as well as future need of jobs for them.

Education

The Pourashava has good education facilities. There are 15 primary schools, 5 high schools, 3 degree colleges and 2 public libraries provide the education in the Pourashava.

In the project area it is found that 74.7 percent household head have attained education level ranging from primary level to higher education. Out of the total sample 25.3 percent never attended school. Majority of the household head of the area have attained primary and secondary level education accounts 17.7 percent and 43.1 percent respectively. Only 4.9 percent household head are completed above degree concentrated all ward except ward no 5 and 7.

Migration Status

Majority of the migrant came from same Upazila which recorded as 75 percent, where as the second highest migration took place from other Upazila which recorded to 16.7 percent. About 8.3 percent of people other districts due to transfer for job purpose mainly. About 20 percent of the inhabitants came in the Pourashava after 2000. Remaining 52 percent people came during 1980 to 2000.

Business and commerce related jobs are the major causes of migration to this Pourashava which reported to 28.6 percent. Permanent home town recorded to 4.1 percent since by birth. Next migrations are taking place for service or transfer purpose recorded to 14.3 percent. Education and attraction on urban life also the cause for migration to this Pourashava reported to 14.3 percent.

Some Urban Facilities

Drinking Water Facilities

There are various sources of water supply available in the study area. Household owned tube wells are predominant. There is no piped water supply system in the Chandanaish Pourashava. Most of the families have their own tube well for drinking. A significant number of households depend on Pourashava or Govt. tube well for safe drinking water.

Toilet Facilities

Sanitation facilities are not adequate. Waste collection bins and waste transport & disposal facilities are available in the Pourashava. In Chandanaish Pourashava, about 89.6 percent households have been used sanitary toilet. There are 10.9 percent respondents reported to use insanitary latrines and the remaining 2.2 percent has no toilets particularly in the Ward 1.

Electricity

According to the pourashava authority, all the pourashava area has been brought under rural electrification programme. However, a small portion of the inhabitants of the pourashava are not satisfied with the service of electricity connection.

2.2 Economic Development

There are two basic elements of economic development i.e. employment generation and incremental development of the urban livelihood. Employment opportunities act as a strong pull factor for influx of job seekers in the urban areas.

Economic activities are majorly grown along with the road side of Chittagong-Cox's Bazar Highway. Most of the pourashava area is occupied by huge tracts of agricultural land and sporadic homesteads, at places showing the signs of development along with the huts, bazaars indicating the dominant role of rural agricultural economy. This indicates that the general features of the project area are a mixture of rural and semi-urban nature.

The economy of the project area is predominantly agricultural in nature which includes farming and social forestry as well. In the formal sector economic activities includes service and trading activities carried out in and around Chandanaish pourashava and other areas scattered over the various Wards. These establishments of the formal sector play an important role in local as well as regional economy. Contribution of the informal sector in providing employment to the unemployed or under-employed agricultural Labors of the project area is also remarkable.

Occupation and Main Source of Income

The occupational patterns somehow reflect the semi-urban nature of the area. From the occupational pattern it is found that a maximum percentage of people are engaged in the profession of small business (31.6%). Land owning peasant and agricultural labor together constituted of 30.9 percent of total work force followed by large business 8 percent. Private Service is constituted of 6.3 percent. Service in government organizations are engaged about 2.1 percent. It is also seen that in Chandanaish Pourashava there is 8.3 percent household head are employed or retired. So it can be said that 8.3 percent household are above 57 years old or they are not fit to do any work or some of the household head are seasonally unemployed and looking for job.

Income

In Chandanaish Pourashava, business is the main source of income of the family of the Chandanaish Pourashava is recorded 44.4 percent of the respondent. About 12.8 percent of the respondent said service is the main source of income and 33.3 percent of the people are engaged with Agricultural activities as main source of income. About 9.4 present respondents said others activities (all activities except service, business and agriculture activities) are the main source of income in Chandanaish Pourashava.

In the Chandanaish Pourashava, most of the families have two earning member recorded to 59.1 percent. 35.7 percent household have single earning member. These families are seems to be nuclear families rather than joint family. There are 3.5 percent families who have 3 earning

members. About 1.7 percent families have 4 earning members who are leading the joint families obviously.

Majority head of the families' income ranges 9000BDT – 12000BDT constitutes 39.6 percentage of the total household of the Pourashava. About 36.6 percent of the household heads income ranges of BDT 6000-9000 per month representing second highest income band. Among others, 17 percent have earned within the range of BDT 12000 to 15000. Only 2.8 percent household head earn more than 15000 BDT per month. Only 0.7 percent household head earn below 3000 BDT per month.

Expenditure

In Chandanaish Pourashava it is found that average expenditure of Chandanaish Pourashava is 9452 BDT per family for every month. The inhabitants of Chandanaish Pourashava maximum portion (67.48 percent) of income spends in food followed by Transportation cost (6.61 %) and fuel cost (6.28 %). The entire respondent in Chandanaish Pourashava said that they had not spent any money for water, recreational and others purposes.

Household and Tenancy of Dwellings and Land

In the Chandanaish Pourashava, 97.76 percent people are the permanent residence and the remaining 2.24 percent are temporary residences who are usually migrants from the other Pourashava or surrounding areas.

Ownership of the House

Status of residence or ownership of dwelling places is a key socio-economic indicator for forecasting the housing demand in the Pourashava. From the survey it is found that most of the dwellers are living in their owned houses to 97.9 percent. Only 0.3 percent families are in rental accommodations.

Land Value

Land value of all categories of land types in Chandanaish Pourashava are expensive compared to surrounding Pourashava. Land value per decimal in the Pourashava varies from BDT 13375 to BDT 156666. Land value per decimal in the Pourashava varies from BDT 10733 to BDT 207692.

2.3 Physical Infrastructure Development

Chandanaish Pourashava is a small but dominant urban centre in Chittagong Zila. Due to its locational advantages through roads, it has good potential for urban development. The Pourashava have good marketing channel, as there is good transportation network with Chittagong and Cox's Bazar. Goods can easily transport in the other regional cities of the country. Since new offices of the government for different departments, allied institutions and agencies have sprung up in the pourashava centre to achieve development activities.

Uncontrolled and scattered developments are taking place in and around the Pourashava area. Most of the offices are located in the ward No. 2. Major growth are developed around the Pourashava are upazila mor and college mor at Chittagong-Cox's Bazar Highway.

2.3.1 Road access to Household

Most of the roads in the Pourashava are pucca reported to 35.18 percent. About 32.42 percent reported to semi-pucca road and 32.42 percent are Katcha respectively.

2.3.2 Transport Problems

Road transport is the main available transportation system in the Pourashava. Regular bus services are available in the Chittagong-Chandanaish-Cox's Bazar highway. Most of the transports are available from Biddini Pukur Stand, College Goli Stand, Baghicha Hat Stand. Internal movement can meet up by rickshaw, auto-rickshaw and rickshaw van.

About 22.7 percent of the households are reported that they have faced traffic congestion due to narrow width of the roads. Roads are flooded and damaged time to time during rainy seasons reported to 70.27 percent.

Majority of the respondents (95.4 percent) have opinioned to have more roads in the Pourashava. 97.8 percent respondents of the study area also reported to widening the existing roads. Remaining 2.2 percent respondents are negative opinion for widening the existing road.

2.3.3 Drainage

Provisions of drainage facilities are the most concern to human settlements to create better living environment. Failure to provide the adequate drainage facilities results in flooding and water logging. Water logging occurs for the short period of times. The problem of water logging is acute during rainy season. Water logging and drainage system is the interrelated component, as water logging results from the absence of proper drainage system.

Natural and manmade drainage system in the Chandanaish Pourashava at a glance:

- Length of constructed drainage system
 - Pucca drain: 3.24 km
 - Katcha drain: 0.25 km
- Number of ponds/ditches : 1706
- Natural drainage system (Khals/rivers): 1 river, length of khals: 17 km

Most of the drainages are not in good condition. Majority of the respondent (91.8 percent) said that drainage facility is not available except ward no 1 and 7 of the Pourashava. Among the other areas, 7.4 percent have pucca drain and only 0.4 percent said availability of katcha drain. Majority of the households (98.9 percent) are desired to have more drains in the study area. Remaining 1.1 percent households thinks that the existing drains are enough, so no need to construct more drain.

2.3.4 Sewerage

Sewerage system is very important component from the environmental point of view but in this pourashava there is no sewerage system.

2.3.5 Sanitation and Solid Waste

The area is partially covered by solid waste collection and disposal network. Pourashava has set up 10 open waste collection bins and waste transportation trucks are used for waste management in this area. All of the bins are relatively good condition. A garbage truck and trolleys are used for transporting waste and found to be dumped in the open air. About 89.6 percent households have been used sanitary toilet. There are 10.9 percent respondents reported to use insanitary latrines and the remaining 2.2 percent has no toilets particularly in the Ward 1.

2.3.6 Katcha Bazaar

There are 4 markets, 4 weakly hats and 2 fish and meat market available in the Chandanish Pourashava.

2.3.7 Shopping Centre

There is no shopping centre in the Chandanaish Pourashava. Four shopping markets including departmental store, grocery shops and restaurant are provided services to the community of the Pourashava.

2.3.8 Bus Stand

Bus service is available in Chandanaish Pourashava. Most of the transports are available from Biddini Pukur Stand, College Goli Stand, Baghicha Hat Stand.

2.3.9 Railway Station

There is no rail station in the Pourashava.

2.3.10 Waterway Terminals/ Ghats

Chandanaish Pourashava has no communication in waterway.

2.4 Environmental Growth

The major environmental problems in the project area are related to solid waste management, water pollution and social environment. Tropical cyclones, thunderstorms, tropical depressions are the common types of storms that occur in and the Pourashava at different times of the year.

2.5 Population

Chandanaish Pourashava consists of 9 wards occupies 19 sq.km. The sex ratio in the Pourashava is found 93 in 2011.

Socio-economic survey revealed that a large number families comprise .18 percent of the sample population of the project area belong to 16-57 age group. The latter 6-15 age group covers only 27.81 percent while 57+ and below 6 age groups cover 2.67 percent and 11.34 percent respectively.

On the other hand the percentage of people in the 26-57 age groups (economically active group) indicates that in the project area supply of labor force is 29.09. The percentage of people in the 06-25 age groups indicates the requirement of academic institutions as well as future need of jobs for them.

2.6 Institutional Capacity

Local Government (Pourashava) Act, 2009 covered the constitutional or legal provision for governance issues of Pourashava management. Financial aspects of revenue and tax collection, expenditure and financial management are done accordingly with the consistence of the government rules and regulation. Spatial development system and development control have been exercised through the power of the ordinance.

Elected Pourashava Mayor is the executive authority for development and controlling the Chandanaish Pourashava. Nine elected ward councilors assist him as development partner to the ward wise development. Appointed engineers and other supporting staffs are worked as per the rules of the ordinance and with the direction Mayor.

2.6.1 Manpower

Chandanaish Pourashava established as a class “B” Pourashava declared through a government notification dated on June 26, 2002. Chandanaish pourashva is suffering from lack of manpower to conduct the municipal activities efficiently.

Government sanctioned manpower of “B” class Pourashava is shown in the *Figure 2.2* but the actual organogram shown in *Figure 2.1. Table 2.1* shows the existing manpower compare to the government sanctioned manpower.

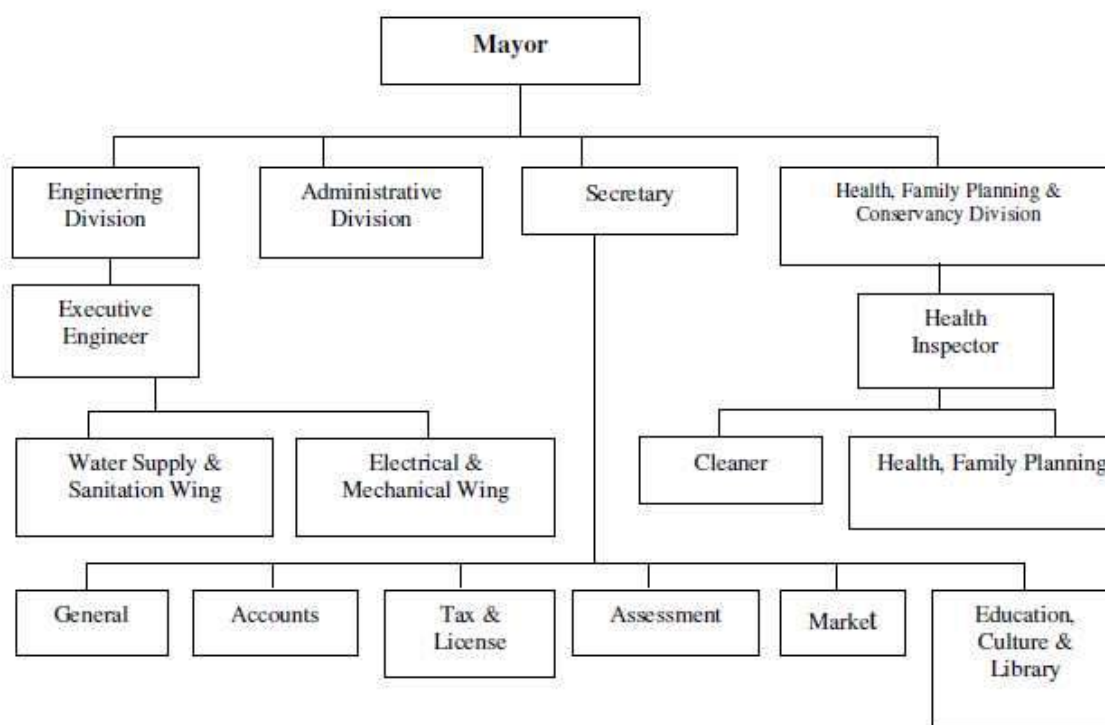


Figure 2.1: Existing Organizational Structure of Chandanaish Pourashava

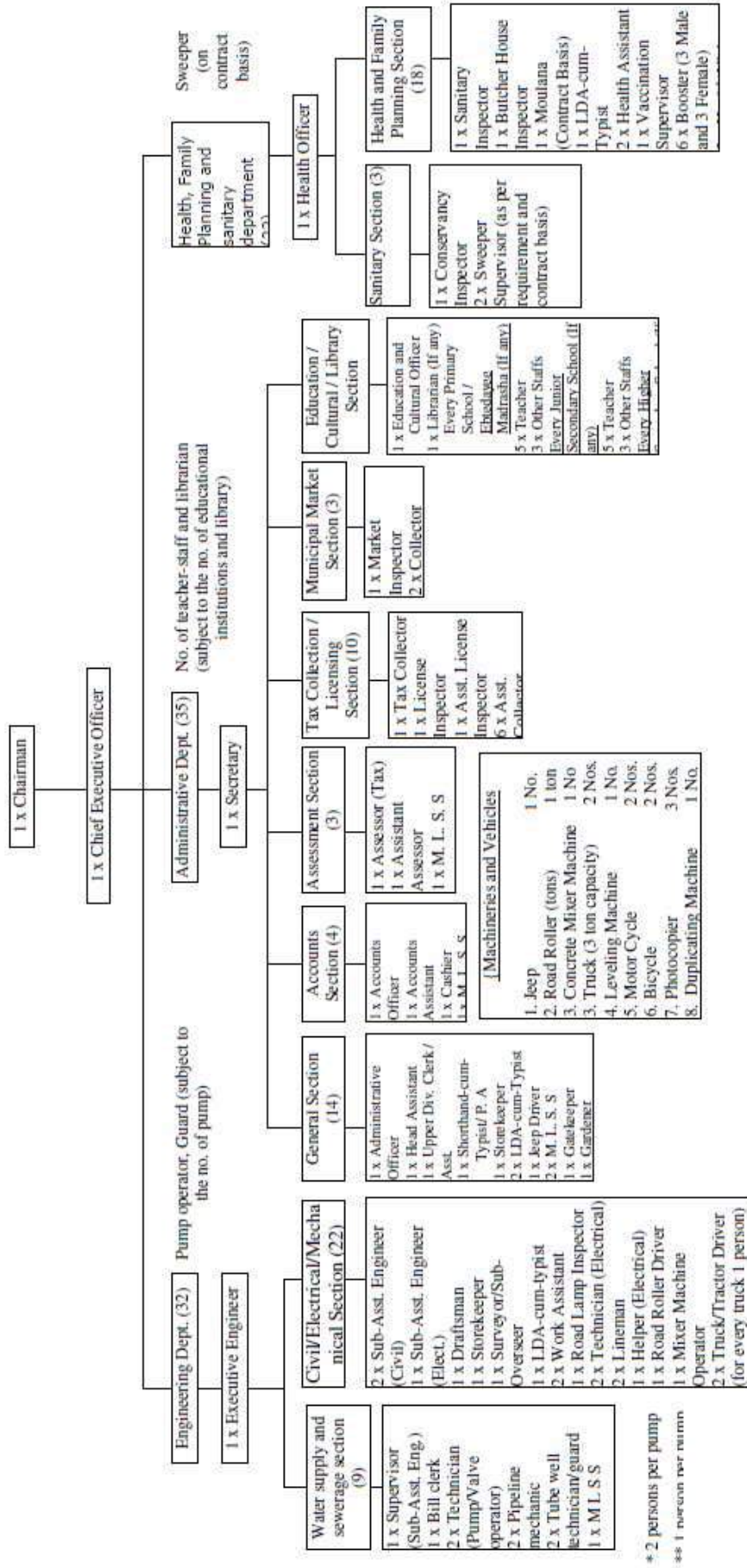


Figure 2.2 Organizational of Structure for B Category Paurashva

Table 2.1: Existing manpower compare to the government allocated manpower

No.	Department/ Section/ Designation	Proposed for B class Pourashava	Exists in the Pourashava
Engineering Department		32	6
1	Executive Engineer	1	0
2	Asst. Engineer	1	1
3	Sub- Asst. Engineer	2	1
4	Surveyor	1	0
5	Electrician	6	1
6	Driver (Truck)	1	0
7	Driver (Road Roller)	1	0
8	MLSS	2	1
9	Night Guard	1	0
10	Other Staffs	16	2
Administrative Department		35	12
11	Secretary	1	1
12	Administrative Officer	1	1
14	Accountant	1	0
15	Cashier	1	1
16	Other Staffs	1	0
	Assessment Section	3	0
17	Assessor (Tax)	1	1
18	Assistant Assessor	1	0
19	M.L.S.S	1	1
20	Tax Collector	1	1
20	License Inspector	1	1
22	Asst Collector	6	0
23	Market Inspector	1	1
24	Other Staffs	15	4
Education/ Cultural/ Library Section		9	0
26	Librarian	* ..	0
27	Teacher	* ..	0
28	Other Staffs	* ..	0
Health, Family Planning and Sanitary Department		22	4
29	Health Officer	1	0
30	Conservancy Inspector	1	1
31	Sanitary Inspector	1	0
32	Health Assistant	2	0
33	Vaccination Supervisor	1	1
34	Health Visitor	1	0
35	Sweeper supervisor	1	0
36	Booster	6	0
37	Other Staffs	8	2

Note: (*) depends on educational institution and library

2.1.6.2: Financial aspects/capacity

- 1) For every Pourashava there shall be a fund which shall be known as the Pourashava Fund.
- 2) To the credit of a Pourashava Fund formed under subsection (1) shall be placed as follows:
 - (a) The balance of such fund as on the coming into force of this Ordinance is at the disposal of the Pourashava of which it is the successor;
 - (b) The proceeds of all taxes, rates, tolls, fees and other charges levied by the Pourashava under this ordinance ;
 - (c) All rents and profits payable or accruing to the Pourashava from the property vested in or managed by the Pourashava;
 - (d) All sums received by the Pourashava in the performance of its functions under this ordinance or under any other law for the time being in force;
 - (e) All sums contributed by individual or institutions or by any local authority;
 - (f) All receipts accruing from the trusts placed under the management of the Pourashava;
 - (g) All grants made by the Government and other authorities; (h) all profits accruing from investment; and

Such proceeds from such sources of income as the Government may direct to be placed at the disposal of the Pourashava.

Revenue Receipts

Hat-Bazaar Lease, Holding tax, Trade license, Rickshaw license, Construction fees, verities application fees, nationality and all certificate fees, Tender schedule sell etc are sources of revenue receipts by the Pourashava.

Municipal Taxation

A Pourashava may, with the previous sanction of the Government, levy, in the prescribed manner, all or any of the taxes, rates, tools and fees mentioned in the First Schedule.

Notification and enforcement of taxes

- (1) All taxes. Rates, tolls and fees levied by a Pourashava shall be notified in the official Gazette, and unless otherwise directed by the Government, shall be subject to previous publication.
- (2) Where a proposal for the levy of a tax, rate, toll or fee or for a modification of tax, rate, toll or fee which is in force, is sanctioned, the sanctioning authority shall specify the date for the enforcement thereof, an such tax, rate, toll or fee or the modification shall come into force on such date.

Model Tax Schedules

The Government may frame model tax schedules, and where such schedules have been framed, the Pourashava shall be guided by them in levying a tax, toll or fee.

Directions with regard to levy of taxes

- 1) The Government may direct any Pourashava
 - (a) To levy any tax, rate, toll or fee which the Pourashava in competent to levy under section 54; or

- (b) To increase or reduce any such tax, rate, or fee, or the assessment thereof, to such extent as may be specified; or
- (c) To exempt any person or class of persons or property or class or property from the levy of any such tax, rate, toll or fee or suspend or abolish the levy of any such tax, rate, toll or fee.

If a direction issued under sub-section (1) is not complied with within the specified time, if any, the Government may make an order giving effect to the direction.

Liability on account of Taxes

- 1) A Pourashava may by notice call upon any person to furnish such information, produce such record or accounts, or present such goods or animals liable to any tax, rate, toll or fee, as may be necessary for the purpose of determining the liability of such person, goods or animals to a tax, toll or fee, or the assessment thereof.
- 2) Any official of a Pourashava authorized in this behalf may, after due notice, enter upon any building or premises for the purpose of assessing the liability of such building or premises to any tax, or inspection any goods or animal therein liable to any tax.
- 3) Any officer of a Pourashava authorized in this behalf may, after in the prescribed manner, seize and dispose of any goods or toll is due and is not paid.

Collection and Recovery of Taxes

- 1) All taxes, rates, tolls and fees levied under this Ordinance shall be collected in the prescribed manner.
- 2) All arrears of taxes, rates, tolls and fees and other moneys claimable by a Pourashava under this Ordinance shall be recoverable as a public demand.
- 3) Notwithstanding the provisions of sub-section (2), the Government may empower any Pourashava to recover arrears of taxes, rates, tolls, fees and other moneys claimable by the Pourashava under this ordinance by distress and sale of movable property belonging to the person concerned, or by attachment and sale of the immovable property belonging to him.
- 4) The Government may by rules specify the officials or classes of officials by whom the power under sub-section (3) shall be exercised, and prescribe the manner in which it shall be exercised.

Petitions against Valuation, Assessment, etc

No assessment of a tax, rate, toll or fee under this Ordinance, or valuation, thereof, or the liability of a person to be so taxed, shall be called in question except by a petition presented to such authority, in such manner and within such period as may be prescribed.

Deduction of Taxes from Salaries

If a Pourashava levies a tax on professions, trades or callings, it may require the employer of the person liable to such tax to deduct the tax from the salary or wages payable to such person, and on such requisition the amount of the tax due shall be deducted from the salary or wages of the person concerned and credited to the Municipal Fund, provided that the amount so deducted shall in no case exceed twenty-five per cent of the salary or wages.

Taxation Rules

- 1) All taxes, rates, tolls, fees and other charges levied by a Pourashava shall be imposed, assessed, leased, compounded, administered and regulated in such manner as may be provided by rules.
- 2) Rules made under this section may, among other matters, provide for the obligations of the tax-payer and the duties and powers of the officials and other agencies responsible for the assessment and collection of taxes.

2.1.6.3 Educational (Primary School, High School, College, Library)

There are 15 primary schools provides the primary education in the Pourashava. Most of respondents reported that the distance of Primary schools within walking distance. Only 1.7 percent respondents said they are away from the primary schools by more than 1km.

According to Pourashava records and physical feature survey there are 5 high schools located in the ward no. 1, 4 and 9. 94.4 percent of the respondents reported that the distance of high schools within the range 1 km. among the others 5.2 percent respondents said that they travel one to two and 0.3 percent of the households is traveling more than 2 km kilometers to reach high school.

There are 3 degree colleges in the ward no. 2 and 9 found in the Pourashava area. For getting college education, 2.1 percent respondents reported to travel half kilometer. Majority of the respondents (65.6 percent) are traveled 0.5 km to 1.00 km. Only 19.4 percent of the households are away from the college by 1 km to 2 km, remaining 12.8 percent students travel more than 2 km for this service.

In the Chandanaish Pourashava, there is no public library. High schools and college also provides library facility to their premises.

2.1.6.4 Health (Hospital, Private Clinic)

The Pourashava has a Nagor Health complex at Kyuk Khali Para in ward 3. There is a hospital named Aman Hospital in ward 4.

Three private clinics and three family centers are provided health facilities in this Pourashava located in the Ward no. 2, Chandanish Sadar and Khan Hat.

2.1.6.5 Religious (Mosque/ Temple)

The inhabitants of the Pourashava are mixed religion dominated by Muslim. Main religions of this area are Muslims and Hindu. There are 51 mosques, 25 temples, 25 graveyards, and 1 eidgah are found in this Pourashava for performing the religious activities.

In Chandanaish Pourashava, It was observed that Muslims are the dominant community in the Pourashava area recorded to 92 percent of the total Pourashava followed by Hindu community is 8 percent respectively. There is no Christian, Buddhist, other religion or tribal in this Pourashava.

2.1.6.6 Civic Services

Provision of cinema hall, playground, park, and stadium are the important aspect in city planning. Normally open spaces/parks and recreational areas are always under demand by city dwellers. The existing land use survey shows that there have no special recreational facilities in the Pourashava.

Community services include club, sahid minar, mosque, astana and mazar encompass 23.44 acres of land in the Chandanaish Pourashava. About 0.50 percent of the total Pourashava lands are occupied by civic services.

2.1.6.7 Public Places

There is no recognized place identified in the Chandanaish Pourashava. Most of the public gathering is taking place in Chandanaish bazar area and in the college ground. During planning stage this aspect will be taken care of.

2.1.7 Urban Growth Area

The growth structure shows that development has taken place in elongated form along the road network with very little depth. Some of the settlements are old and katcha roads provide access to them. In the process development are taking place around them. Development pressure is also found in important transportation node.

The Chandanaish Pourashava center and its surrounding areas couldn't attain the true urban character but it is fast transforming into an urban area. Uncontrolled and scattered developments are taking place in and around the Pourashava area. Most of the offices are located in the ward No. 2. Major growth is developed around the Upazila mor and College mor at Chittagong-Cox's Bazar Highway. Population concentrations are taking place in the ward no. 1, 6, 8 and 9.

Growth direction indicates that substantial development is taking place in the central area on Chandanaish Upazila mor, College mor Pourashava mor.

2.1.8 Catchment Area

Chandanaish Pourashava jurisdiction covered an area of 4676.46 acres i.e. about 18.92 square kilometers, which was considered as the planning area in consultation with the Mayor and Councilors of the Pourashava at the time of survey period consultation. After the interim report submission and at the time of draft plan preparation, consultants made several consultations with Pourashava Mayor and Councilors even with local Parliament Member and others adjacent union Parishad member and decided not to extend the Pourashava for the preparation of 20 years development plan of Chandanaish Pourashava.

2.1.9 Land Use and Urban Services

The Pourashava centre and its surrounding areas are still predominately rural. It has not attained its true urban character and it is fast transforming into an urban area.

Existing land uses in the study area is showing that agricultural land is the highest as 63.95 percent and land use for transport and communication is the lowest as less than 0.01 percent in this Pourashava. Land use for urban green space is also remarkably low i.e. only 0.72 percent.

Commercial land use occupies only 41.03 acres of land that constitutes only 0.88 percent of the total land. There are few processing and manufacturing industries which occupy 0.36 acres of land that constitute only 0.01 percent of total land use. It is also observed that about 31.21 acres is used as educational facility and 0.72 acres is used as recreational area, which constitutes respectively only 0.67 percent and 0.02 percent of the project area. Residential land use within the study area is 877.97 acres, which constitute 18.77 percent of the Pourashava area. The broad land use description is summarized in *Table 2.2*.

Table 2.2 Description of Existing Land Use Categories

Sl. No	Landuse	Area (in Acre)	Percent of total area (%)
1	Residential	877.97	18.77
2	Commercial Use	41.03	0.88
3	Industrial Use	0.36	0.01
4	Educational Facility	31.21	0.67
5	Community Services	23.34	0.50
6	Service Activity	5.44	0.12
7	Recreational Facility	0.72	0.02
8	Governmental Services	6.98	0.15
9	Non-Government Services	1.05	0.02
10	Urban Green Space	33.57	0.72
11	Transport and Communication	0.21	0.00
12	Agricultural Use	2990.7	63.95
13	Mixed Use	0.25	0.01
14	Circulation Network	77.94	1.67
15	Water body	585.3	12.52
16	Miscellaneous	0.39	0.01
17	Restricted Area	-	-
18	Vacant Land	-	-
19	Forest/ Hilly Area	-	-
Total Area		4676.46	100

Source: Field Survey, 2009

2.1.10 Pourashava Functional Linkage with the Regional and National network

Chandanaish Pourashava is an important urban centre in Chittagong Zila. Due to its locational advantages through roads it has good potential for urban development. The Pourashava have good marketing channel, as there is good transportation network with both Chittagong and Cox's Bazar. Goods can easily transport in the other regional cities of the country from the Chandanaish Pourashava. Since new offices of the government for different departments, allied institutions and agencies have sprung up in the Pourashava centre to achieve development activities.

2.1.11 Role of Agencies for Different Sectoral Activities

As an Upazila headquarter the Pourashava have Upazila Nirbahi Office, major Government offices, NGOs. Moreover some educational institutes like college, high school, primary school etc. are situated in the core area of the Pourashava. Forest Research Institute is available in the core area. Besides, Non Government Organizations (NGOs), as social organization have become part of the socio-economic activities over the last few decades. The NGOs render services in the fields of poverty alleviation programs, awareness building, health care, education, water supply, sanitation, micro-credit and training on Income Generating Activities (IGAs) including skill development. NGOs provide services in the field of micro-credit; encourage social services, advance loan for poultry, fisheries, livestock, agriculture, house building, land purchase and capital loan for running business. NGOs also take part in various social activities like awareness building on environment, poverty alleviation, natural calamities, health and many other fields. A good number of people especially women and poverty-stricken has been getting various types of services from the NGOs for quite a long period.

Chapter 3: Projection of Future Growth by 2031

3.1 Introduction

Projected population was estimated with the help of past trend of population. The population census year of 1981, 1991 and 2001 are used for calculating the population growth rate. All mouza of the Chandanaish Pourashava is exhibited the consistent of population growth rate.

3.2 Projection of Population

Population projection was done with the growth trend analysis of inter-censal period of 1974-1980, 1981-1991 and 1991-2001. Following exponential formula was used for the estimation of future population.

$$POP_{PROJ} = POP_{LAST} (1 + GROWTH.RATE)^{(PROJ.YEAR - LAST.YEAR)}$$

Over the decade 1991-2001 population growth rate was found in 11.4% and annual compound growth rate being 1.09% in Chandanaish upazila. Urban area population growth rate of Chandanaish Upazila during 2001 census year was 1.50 percent. Socio-economic activities have also been increased proportionately with the growth of urban population. Present level of service in many areas is so low that there is a threat to the public health in particular and the environmental quality in general. As such, most of the urban local bodies are finding it difficult to keep pace with the demand for adequate civic facilities, health services and urban management.

Table 3.1: Growth Rate in Chandanaish Pourashava in comparison with Chittagong District and Chandanaish Upazila

Name of the Location	Growth Rate (Decade)	
	1981-1991	1991-2001
Chittagong District	Not Available	63.48
Chandanaish Upazila	10.9	11.4
Chandanaish Pourashava	Not Available	16.07

Source: BBS 1991, and BBS 2001

Projected population was estimated with the help of past trend of population. The population of census year 1991, 2001 and 2011 are used for calculating the population growth rate. All mouza of the Chandanaish Pourashava is exhibited the consistent of population growth rate. Table 3.2 shows the mouza wise population distribution and population growth rate in different Census of Chandanaish Pourashava.

Table 3.2: Mouza wise population distribution and population Growth Rate in different Census of Chandanaish Pourashava

Mouza name	Population			Growth Rate	
	Population 1991	Population 2001	Population 2011	1991-2001	2001-2011
Harala	4,963	5,760	3,055	1.50	-3.08
Uttar Joara	7,731	8,972	512	1.50	-3.08
Hashimpur	14,753	17,122	19,926	1.50	-3.08
Gachhbaria	8,250	9,574	4,305	1.50	-3.08
Chandanaish	5,867	6,809	3,712	1.50	-3.08
Dakshin Joara	3,812	4,424	4,927	1.50	-3.08
Total	45,376	52,661	36,437	1.50	-3.08

Source: BBS and Calculation by the Consultant

Note: The growth rate of 2001-2011 decade has become negative due to the propensity of out-migration.

Annual population growth rate of whole upazila is found higher during the census year 2011 and lower in the year of 2001. As, the overall national population growth rate has decreased in the

upcoming year, urban area population growth rate during the census year 2001 (1.50 Percent) is considered here to project the future 20 years population in the Chandanaish Pourashava.

The projection shows that the population of the Chandanaish Pourashava will be 81,183 thousands in 2016, 87,457 thousands in 2021, 94,216 thousands in 2026, and 101,498 thousands in 2031. The projected population data on mouza level is presented in Table 3.3.

Table 3.3: Population Projection of Chandanaish Pourashava

Ward No.	Area (in acre)	Population 2011	Projected Population			
			2016	2021	2026	2031
Ward No-01	711.66	8,925	9,615	10,358	11,158	12,021
Ward No-02	217.45	7,892	8,502	9,159	9,867	10,629
Ward No-03	452.20	7,163	7,717	8,313	8,955	9,648
Ward No-04	318.76	6,259	6,743	7,264	7,825	8,430
Ward No-05	1314.59	6,426	6,923	7,458	8,034	8,655
Ward No-06	484.32	8,355	9,001	9,696	10,446	11,253
Ward No-07	303.94	7,452	8,028	8,648	9,317	10,037
Ward No-08	407.72	12,002	12,930	13,929	15,005	16,165
Ward No-09	484.32	10,885	11,726	12,632	13,609	14,661
Total	4695.33	75,359	81,183	87,457	94,216	101,498

Source: BBS and Calculation by the Consultant

Note: Though, the population of Chandanaish Pourashava in 2011 as per BBS 2011 reveals different figure than the consultant projected but the demand analysis and plan preparation period has been considered before the Census survey conducted in 2011. Therefore, earlier years have been considered base year for population projection.

3.3 Identification of Future Economic Opportunities

There are enormous possibilities of development of this Pourashava. The major potentialities are:

- Household based poultry and dairy farms and other SMEs related to these farms need to be provided financial and extension services to attain sustainable development.
- The project area may be developed as place of fish processing industrial zone.
- Agro-based industries including food processing SMEs based on local raw materials has a good prospect;
- Infrastructure development schemes may be undertaken based on Public Private Partnership (PPP) basis.

3.4 Projection of Land uses

The land use distribution pattern shows that the Pourashava has mainly grown following the major transport networks. Present development is taking place at the road side of Dhaka-Chittagong-Cox's Bazar highway. The Office of the Upazila Nirbahi Officer and other major Government offices, boys' high school and college are located in the core of pourashava.

The ward wise distribution of existing land uses helps guiding the allocation of land for future planning of the Pourashava. The most important prospect for the preparation of master plan is the availability of land that can be easily developed for future use.

Basis for Projection

All development plans will be drawn on the basis of projected population and future demand followed by existing uses.

- Existing land uses in the study area is important determinants to quantify the future needs and demand.

- Physical development trend and potential land for urbanization
- Trend of population growth

Future land uses services are estimated on the basis of population projection and the provision of standard format supplied by LGED. Additional areas of land uses are calculated by subtracting existing acreage of land uses from the projected areas of acreage.

Demand Analysis

The plan has been prepared to provide services for the increased population along with covering up of the present shortfall. Job market must provide employment to the new comers. The land use demand for ancillary services has been estimated on the basis population projection and standard format, shown in *Table 3.4*.

Table 3.4: Landuse Demand analysis based on given Planning Standard

Type of Land Uses	Recommended Standard Provision (unit)	Existing (acre), 2011	Future Land Requirement (acre)				Surplus (-) or Deficit (+)
			2016	2021	2026	2031	
Residential		877.97	811.83	874.57	942.16	1014.98	137.01
General residential	100 persons/ 1 acre		811.83	874.57	942.16	1014.98	
Real Estate- Public/Private	200 population/ 1 acre						
Roads		77.94	309.53	309.53	309.53	309.53	231.59
Primary roads	150-100 feet		309.53	309.53	309.53	309.53	
Secondary roads	100-60 feet						
Local roads	40-20 feet						
Education		31.21	122.72	131.81	141.61	152.17	120.96
Nursery School	0.5 acre/ 10,000 pop		4.06	4.37	4.71	5.07	
Primary School/ Kindergarten	2 acres/ 5,000 pop		32.47	34.98	37.69	40.60	
Secondary / High School	5 acres/ 20,000 pop		20.30	21.86	23.55	25.37	
College	10 acres/ 20,000 pop		40.59	43.73	47.11	50.75	
Vocational Training Centre	5-10 acres/Upazila		5	5	5	5	
Others	5 acres/ 20,000 pop		20.30	21.86	23.55	25.37	
Open Space		3.56	174.54	188.03	202.56	218.22	214.66
Play field / ground	3 acres/ 20,000 pop		12.18	13.12	14.13	15.22	
Park	1 acre/1,000 pop		81.18	87.46	94.22	101.50	
Neighborhood park	1 acre/1,000 pop		81.18	87.46	94.22	101.50	
Recreational		-	9.06	9.37	9.71	10.07	10.07
Stadium/sports complex	5-10 acres/ Upazilla HQ		5	5	5	5	
Cinema/ Theatre	1 acre/ 20,000 pop		4.06	4.37	4.71	5.07	
Health		2.73	26.24	27.49	28.84	30.30	27.57
Upazila Health Complex / Hospital	10-20 acres/ Upazilla HQ		10	10	10	10	
Health Center/ Maternity Clinic	1 acre/ 5,000 pop		16.24	17.49	18.84	20.30	
Community Facilities		23.34	23.80	25.36	27.05	28.87	5.53
Mosque/ Church/Temple	0.5 acre/ 20,000 pop		2.03	2.19	2.36	2.54	
Eidgah	1 acre/ 20,000 pop		4.06	4.37	4.71	5.07	
Graveyard	1 acre/ 20,000 pop		4.06	4.37	4.71	5.07	
Community Center	1 acre/ 20,000 pop		4.06	4.37	4.71	5.07	

Type of Land Uses	Recommended Standard Provision (unit)	Existing (acre), 2011	Future Land Requirement (acre)				Surplus (-) or Deficit (+)
			2016	2021	2026	2031	
Police Station	3-5 acres/ Upazilla HQ		3	3	3	3	
Police Box/outpost	0.5 acre/ per box		0.5	0.5	0.5	0.5	
Fire Station	1 acre/ 20,000 pop		4.06	4.37	4.71	5.07	
Post office	0.5 acre/ 20,000 pop		2.03	2.19	2.36	2.54	
Commerce and Shopping		41.03	92.55	99.45	106.89	114.90	73.87
Wholesale market	1 acre/ 10,000 pop		8.12	8.75	9.42	10.15	
Retail sale market	1 acre/ 1,000 pop		81.18	87.46	94.22	101.50	
Corner Shops	0.25 acre / corner shop		0.25	0.25	0.25	0.25	
Neighborhood market	1 acre / neighborhood market		1	1	1	1	
Super Market	1.5-2.5 acres/super market		2	2	2	2	
Industry		0.36	202.96	218.64	235.54	253.75	253.39
Small scale	1.5 acres/1,000 pop		121.77	131.19	141.32	152.25	
Cottage/agro-based	1 acre/1,000 pop		81.18	87.46	94.22	101.50	
Transportation		0.21	16.59	17.06	17.57	18.11	17.90
Bus terminal	1 acre/ 20,000 pop		4.06	4.37	4.71	5.07	
Truck terminal	0.5 acre/ 20,000 pop		2.03	2.19	2.36	2.54	
Launch/steamer terminal	1 acre/ 20,000 pop		5	5	5	5	
Railway station	4 acre/per station		4	4	4	4	
Baby taxi/tempo stand	0.25 acres/only baby taxi/tempo stand		0.5	0.5	0.5	0.5	
Rickshaw/ van stand	0.25 acres/only baby taxi/tempo stand		0.5	0.5	0.5	0.5	
Passenger Shed	0.25 acres/only baby taxi/tempo stand		0.5	0.5	0.5	0.5	
Government Office		7.01	28	28	28	28	20.99
Upazila complex	15 acres		15	15	15	15	
Pourashava office	3-5 acres		3	3	3	3	
Jail/Sub-Jail	10 acres/ Upazila HQ		10	10	10	10	

3.5 Housing

Housing is one of the most vital components of urban life. It is a source of security, safety and everyday comfort. So housing should be considered as a priority area for development. An attempt has been made to draw a picture of the housing situation of Chandanaish Pourashava including its problems.

Problems concerning housing

The problems relating to the housing are mostly concerned with the poor community. Due to their low level of income a vast number of poor are living in the thatched house. 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,

fresh water is a real critical problem for the local habitats. Pourashava services are not inadequate. Drainage is major problem in poor areas.

Prospects concerning housing

Majority household belongs to more than 6 household members representing 73.71 percent. Housing occupancy rate is lower than the national average. Among the total households, 20.1 percent houses are single storied. Majority houses in the study area are katcha representing 66.6 percent of the total houses. Therefore, lots of scopes to accommodate the housing demand either horizontal or vertical expansion.

Basis of Housing Projection

Housing projection will largely depends on the following basis:

- Existing housing situation
- Housing occupancy rate
- Housing pattern (housing types, horizontal and vertical houses)
- Migration or rental pattern
- Population growth rate and
- Housing demand

Housing Demand:

For assessment on the demand of various types of housing, the socio-economic status of the population is important. Different income groups have different types of housing. As a result, in the projection and demand of housing, present income status and increase in future income of the various socio-economic groups will be given due importance.

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

$$H=P/S$$

Where, H= Number of dwelling unit

P= the projected population

S= the average household size

Projected demand for dwelling units for the years 2016, 2021, 2026 and 2031 have been shown in Table 3.5.

Table 3.5: Year wise Projected Housing Requirements (Dwelling Units) in Chandanaish Pourashava

Ward	Projected Housing Requirements			
	2016	2021	2026	2031
1	1265	1363	1468	1582
2	1119	1205	1298	1399
3	1015	1094	1178	1269
4	887	956	1030	1109
5	911	981	1057	1139
6	1184	1276	1374	1481
7	1056	1138	1226	1321
8	1701	1833	1974	2127
9	1543	1662	1791	1929
Total	10682	11508	12397	13355

From the above table it is seen that in 2031 the housing requirements of Chandanaish Pourashava will be 2,127 having highest number of dwelling units in ward 8 and lowest number of dwelling units in ward 4.

Chapter 4: Development Problems of the Pourashava

4.1 Physical Infrastructure

Chandanaish Pourashava established on June 26, 2002. Upazila complex and other important administrative, commercial, industrial, health facilities and education institutes are establishments of Chandanaish Pourashava area. Infrastructures and physical development are not attained significantly in the Chandanaish due to newly formed Pourashava so far.

In total, 54.32 percent buildings are katcha, 14.86 percent are semi-pucca, and 30.83 percent are pucca. Physical quality of building structure in the study area is not satisfactory. An overwhelming majority of housing units are temporary in nature (66.60 percent dwelling units are katcha).

Though the area is not subject to annual flooding, water logging has become a common feature throughout the area. In the rainy season most of the areas become water logged causing inconvenience in the daily life of the people of the project area. Absence of effective drainage channels is the main reason for this water logging.

4.2 Socio-Economic

Although agriculture are the important economic base of the area; non-availability of agricultural inputs including fertilizer in time at the door steps of the farmers, non-implementation of agricultural extension service, cumbersome credit disbursement system in agriculture sector, absence of farm friendly policy and finally very low prices of agricultural products are major hindrance to the development of this prime sector of the project area.

Industrial activities outside the pourashava are sporadically located resulting in high cost of utility delivery. Linear development of settlements makes provision of infrastructure and civic facilities expensive and uneconomic. Absence of efficient and guaranteed power supply make the area unattractive for investment in industrial sector.

It has been found from the study that the entrepreneurs of the project area generally suffer from the following common problems:

- Unreliable electricity supply;
- Scarcity of potable water;
- Insufficient communication infrastructure;
- Shortage of skilled manpower;

Mitigation of the problems will help full utilization of the present capacity and further expansion of economic activities in the project area.

4.3 Environmental

At present few drains exist in the Pourashava area. But these are not sufficient to deal with surface runoff. Eastern side of the Pourashava particularly at the bottom of the hills suffered most vulnerable due to flash flood. Landslides of the hills are also concern issues that might be threat and risk at the bottom and adjacent settlements. Heavy rainfall also causes water logging in the eastern areas.

There are several problems were identified pointed as following manner:

- Uncontrolled conversion of low lying areas to urban land through landfill
- Encroachments of natural canals
- Absence of effective surface drain system
- Uncontrolled and indiscriminate disposal of solid waste into khals and drains
- Lack of proper operation and maintenance of drainage system
- Lack of awareness of people about the need and function of drainage system

Chapter 5: Paurashava Development related Policies, Laws and Regulations

5.1 Indicative Prescription of Policy for Pourashava in the light of the different Urban Policies / Laws Regulation

Effective responses to the challenges posed by rapid urbanization and fulfilling the stated objectives will require giving priorities to the following dimensions while formulating the National Urban Sector Policy:

Pourashava Act

According to the Pourashava Act, every Pourashava shall a body corporate, having perpetual succession and a common seal with power subject to the provisions of this Ordinance and the rules to acquire and hold property, both movable and immovable, and shall be its name sue and be sued.

The Government, be notification in the official Gazette specify the name by which any Pourashava shall be known, and unless the name of a Pourashava is so specified, it shall be known as the Pourashava of the place where its office is situated.

Local Government (Pourashava) Act 2009

After the independence (1971), all local government systems were abolished by the Presidential Order No. 7 in the year 1972 and appointed an administrator in each of the Municipality. After this Order, name of the Local Governments were changed as Town Panchayat instead of Union Committee, Shahar Committee instead of Town Committee and Pourashava instead of Municipal Committee. Shahar Committee was renamed as Pourashava in the year 1973 with a Presidential Order No. 22 and introduced election procedure for the Chairman and Vice-chairman. Thana Parishad Ordinance, 1976 (Ordinance No. XXXII of 1976) was enacted in 21st May 1976 to provide for the constitution of Thana Parishad. Pourashava Ordinance was enacted and notified in the year 1977. Nine Commissioner and selection of female Commissioner in every Pourashava was provisioned in the Ordinance. According to the Pourashava (amendment) Ordinance, 1998, re-distribution of Pourashava Wards was introduced and the Pourashava belongs with 3 Wards proposed for 9 Wards and 12 Wards instead of 4 Wards. One Commissioner for every Ward and one-third Ward of every Pourashava was reserved for female Commissioner who was elected by the general election of the country. Local Government (Pourashava) Ordinance, 2008 (Ordinance No. XVII of 2008) was provisioned 9 Wards, one Mayor and 3 female Councilors for every Pourashava. Mayor and Councilors will be elected through general election. The provision remains in the Local Government (Pourashava) Ordinance, 2009.

From the year 1977 to 2009, Pourashava Act, 1977 has been enforced by the Pourashava authority and the name of the statute was Pourashava Ordinance, 1977. After promulgation of the same statute, name of the Ordinance has changed as Local Government (Pourashava) Ordinance, 2009. Generally, people call it Pourashava Act, 2009.

The Pourashava Ordinances at different time since 1960's till the present time have iterated that a Pourashava as it gets established must prepare its Master Plan for planned municipal development. So far there Ordinances have been made in 1967, 1977 and 2009 all suggesting for planned development.

Functions of Pourashava in the Light of Pourashava Act 2009

The Pourashava Act 2009 is the successor of Pourashava Ordinance 1977 passed on 6, October has made the provision of having the Master plan prepared by a Pourashava within five years of its inception. The function of the Pourashava also include that it ensures planned development following the rules of the ordinance.

The Master Plan should include the following:

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

Pourashava Development Management

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

Table 5.1.

Table 5.1: Functions in brief prescribed in the Local Govt. (Pourashava) Act, 2009

Major activity	Specific functions	Functions in brief
Town planning	Master plan	The Pourashava shall draw up a master plan for the city which shall provide for a survey of the Pourashava including its history, statistics, public services and other prescribed particulars. Development, expansion and improvement of any area within the city; and restrictions; regulation and prohibitions to be imposed with regard to the development of sites, and the erection and re-erection of buildings within the Pourashava.
	Site development schemes	Where a master plan has been drawn up and approved by the government, no owner of lands exceeding such area as may be specified in this behalf in the master plan shall develop the site or erect a building or any plot of land covered by the provisions of a site development scheme sectioned to area in the prescribed manner. Among other matters, a site development scheme may provide for- (a) the division of the site into plots; (b) the street, drains and open spaces to be provided; (c) the land to be reserved for public purposes and to be transferred to the Pourashava; (d) the land to be acquired by the Pourashava; (e) the price of plots; (f) the works that shall be executed at the cost of the owner or owners of the site or sites; and (g) the period during which the area shall be developed.
	Execution of Site Development Schemes	If any area is developed or otherwise dealt with in contravention of the provisions of the sanctioned Site Development Scheme, the Pourashava may by notice require the owner of such area or the person who has contravened the provisions to make such alteration in the site may be specified in the notice as where such alteration is not made or for any reason cannot be carried out, the Pourashava may, in the prescribed manner require and enforce the demolition of the offending structure; and notwithstanding anything to the country contained in any law, no compensation shall be payable for such demolition.
Building construction	Building construction and re-construction	Without approval of the building site and plan by the Pourashava, nobody can construct, re-construct any building in the Pourashava area. The Pourashava will approve the plan within sixty days or refund it within that specified time frame; otherwise the plan will be considered as approved.

Major activity	Specific functions	Functions in brief
	Completion of construction and change, etc.	After completion of the approved building, the owner will notify to the Pourashava within 15 days. The Pourashava may inspect the building and if found any violation of the provision prescribed in the Master Plan or in the Site Development Scheme, the Pourashava may demolish the building and the demolishing cost may be incurred from the building owner.
	Building control	If any building or anything fixed thereon, be deemed by the Pourashava to be in a ruinous state or likely to fall or in any way dangerous to any inhabitant of such building or any neighboring building or to any occupier thereof or to passers-by, the Pourashava may by notice required the owner or occupier of such building to take such action in regard to the building as may be specified in the notice, and if there is default, the Pourashava may take the necessary steps itself and the cost incurred thereon by the Pourashava shall be deemed to be a tax levied on the owner or occupier of the building. If a building is in dangerous condition, or otherwise unfit for human habitation, the Pourashava may prohibit the occupation of such building till it has been suitably repaired to the satisfaction of the Pourashava.
Development	Development plans	The Pourashava shall prepare and implement development plans for specific time. Such Plans shall provide for- (a) the promotion, improvement and development of such function or functions of the Pourashava as may be specified; (b) the manner in which the plans shall be financed, executed, implemented and supervised; (c) the agency through which the plans shall be executed and implemented; and (d) such other matters as may be necessary.
	Community Development Projects	The Pourashava may, sponsor or promote community development projects for the Pourashava or any part thereof and may in this behalf perform such functions as may be prescribed.
	Commercial schemes	The Pourashava may, with the previous sanction of the Government, promote, administer, execute and implement schemes for undertaking any commercial or business enterprise.
Street	Public streets	The Pourashava shall provide and maintain such public street and other means of public commutation as may be necessary for the comfort and convenience of the inhabitants of the Pourashava and of the visitors thereto.
	Streets	No new street shall be laid out except with the previous sanction of the Pourashava. The Pourashava may by notice required that any street may be paved, metalled, drained, channeled, improved or lighted in such manner as may be specified in the notice, and in the event of default, the Pourashava may have the necessary work done through its agency, and the cost incurred thereon by the Pourashava shall be deemed to be a tax levied on the person concerned.
	General provisions about streets	The Pourashava may assign names to streets and paint the names or fix the nameplates on or at conspicuous places at or near the end corner or entrance of the street. No person shall destroy, deface or in any way injure any street, name or name plate, or without the previous permission of the Pourashava, remove the same.
	Street lighting	The Pourashava shall take such measures as may be necessary for the proper lighting of the public streets and other public places vesting in the Pourashava.
	Street watering	The Pourashava shall take such measures as may be necessary for the watering of public streets for the comfort and convenience of the public, and for this purpose, maintain such vehicles, staff and other apparatus necessary.
	Traffic control	The Pourashava shall make such arrangements for the control and regulation of traffic necessary to prevent danger and ensure the safety, convenience and comfort of the public.

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

Urban Management Policy

The government must exert some degree of control over the use and development of urban land based policies and regulations. A range of urban planning tools including land use planning, transportation planning and management, site planning, subdivision regulations and building regulations can be applied to minimize environmental impacts of urban development activities. Following are the major urban management policy:

- Protect sensitive land resources by minimizing activities threatening environmentally sensitive areas.
- Manage hazard-prone lands through improvement of environmental management practices throughout the city.

- Conserve open space, as identified through a participatory planning process that will effectively preserve drainage system, provide greater opportunities for recreation and meet the minimum needs of aquifer recharge.
- Protect heritage structures, and archaeological and cultural sites through appropriate schemes, projects and regulations.
- Control excessive urban sprawl and manage prime agricultural land through the implementation of regulatory reforms.
- Formulation of land information system, land market assessment regulations, efficient and transparent land record and registration system etc.

Land Use Policy

Land use planning should be directed towards developing transport corridors so that urban growth takes place along such corridors and not in a haphazard manner. Regulatory tools such as zoning, subdivision regulations, building regulations etc are used to protect the land for haphazard development. These tools, however, should be more comprehensive and flexible to accommodate rapidly changing urban situations. Zoning is particularly useful for managing sensitive lands and cultural resources. This tool, therefore, should be used to:

- Protect productive agricultural lands by limiting the intrusion of non-agricultural uses;
- Manage floodplains by controlling uses of land within hydrologically defined areas subject to floods of a designated frequency;
- Preserve wetlands by limiting permissible uses to those that do not entail significant surface disturbance or runoff and substantially restricting land-disturbing uses within the areas identified as wetland areas;
- Restore conserve natural canals and ponds
- Facilitate planned unit development by allowing flexible design and clustering of residential development with higher densities on one portion of a land parcel so as to allow agricultural development or to provide increased open space or natural cover elsewhere on the parcel;
- Preserve open space by designating land areas for a variety of purposes such as recreation, future use, green belt etc.; and
- Protect historic sites by imposing stringent control on building exteriors and surrounding spaces with more flexible limitations on the uses of buildings so as to allow adaptive reuse;
- Protect hills in urban areas, specially Chittagong, Sylhet, Khagrachari, Cox's Bazar etc.;
- Protect peri-urban areas from unplanned development.

Housing Policy

Housing situation in urban areas of Bangladesh is, at present, quite unsatisfactory. Apart from the existing huge shortage in housing stock, the majority of the dwelling units are structurally very poor, lack services and utilities, and built without proper planning. In this regard the following can be given priority:

- Housing supply and demand should be assessed and collection, analysis and dissemination of information about housing markets should be done on a regular basis.
- Inappropriate interventions that stifle supply and distort demand for housing and services should be avoided and legal, financial and regulatory frameworks including land use, building codes, building standards etc. should be reviewed and adjusted from time to time.
- Land registration procedure should be simplified so as to make property transactions transparent.
- Appropriate fiscal measures, including taxation should be applied to promote adequate supply of housing and land.
- Step should be taken for periodic assessment of the requirements of government intervention to meet the specific needs of people living in poverty and vulnerable groups for whom traditional market mechanism fails to work; and
- Implementation of legal and regulatory reforms for better operation of housing markets is required, for example, by introducing simplified forms of tenure, procedures for using collateral and non-collateral to access credit, more flexible regulations for mixed land uses, and use of traditional building materials.

Urban Poverty and Slum Improvement Policy

Poverty is a multidimensional phenomenon and should be understood as a condition that manifests itself in a number of ways, including: Inadequate household income; Limited asset base; Lack of access to 'public' infrastructure and services such as piped water, sanitation, drainage, health care, schools, emergency services, etc.; Inadequate legal protection; Voicelessness and powerlessness; and Exploitation and discrimination.

Poverty reduction thus refers to a situation where specific manifestations of poverty are systematically reduced, resulting in a change in short and long-term conditions. Government will take all measures to reduce urban poverty in accordance to its proposed strategy in PRSP 2005. Government will also take priority programme for slum upgrading, slum rehabilitation and improvement of informal areas. This will be aimed towards achieving the Millennium Development Goals (MDGs).

- **The need for in-situ upgrading/improvement of slums:** In view of the millennium development goal to ensure environmental sustainability by achieving significant improvement in lives of at least 100 million slum dwellers, by 2020, there is a need to change attitude towards slum settlements. It should be recognized that slums are an integral part of urban areas and contribute significantly to their economy both through their labour market contributions and informal production activities. An approach based on positive attitude and seeking to improve the lives of the slum dwellers through slum upgrading/improvement should be pursued to meet the millennium development goal. Such an approach, however, should make a distinction between tenable and untenable slums/informal settlements. An informal settlement or a slum may be considered as untenable if human habitation in such settlements entails undue risk to the safety or health or life of the residents themselves or where habitation in such settlements is considered contrary to "public interest" as determined by the local authority through a consultation process involving all the stakeholders. All the slums/informal settlements should be listed

and those categorized as 'Tenable' should be considered for in-situ upgrading/improvement.

- **Resettlement of slum dwellers:** Eviction of slum dwellers and squatters should be avoided. Those residing in listed settlements categorized as 'untenable' are entitled to receive basic minimum services until proper relocation and resettlement provisions have been made. The local authority should draw up elaborate resettlement guidelines, when such relocations and resettlements are absolutely unavoidable, so as to reduce the impacts on and sufficiently compensate the livelihoods of the affected people. The guidelines should also address issues of alternative resettlement sites, service provisions, transportation facilities to workplaces, gender concerns etc. All relocation/resettlement of dwellers of untenable slums/informal settlements should be implemented in accordance with the guidelines as prepared.
- **Ensuring tenure security:** In order to ensure security of tenure steps should be taken to grant land tenure to the poor on government or municipal lands considered as 'Tenable'. Required application, cadastration, and approval procedures for this should be as simple and transparent as possible.
- **Special zones for the urban poor:** The local authority may zone specific land areas for micro-enterprises, farmer's markets, and areas for hawkers' stalls. Special zones may also be created for low-income settlements and regularization of tenable informal settlements. If these are large areas, these should also be broken down into blocks (and super-blocks) to improve social cohesion and management. The boundaries of these areas, special zones, blocks should be negotiated among the stakeholders including the low-income people living in the area. Block boundaries should be recorded in the national record system.
- **Access to infrastructure services:** Emphasis should be given on provision of essential urban services like safe and sufficient drinking water, sanitation, electricity, fuel, garbage disposal, drainage and access roads.
A community-based approach involving active participation of the members of the poor community at all stages of design and implementation of infrastructure projects and in subsequent maintenance should be pursued. In the design and implementation of physical infrastructure and delivery of services, particular needs of women and children should be given due importance.

Urban Transport Policy

Transport interventions in urban areas should aim at improving transport and traffic infrastructure and its policy priorities. In urban areas roads are the main system of transportation and policies must be made to make better use of existing road infrastructure and giving highest priority to pedestrians and to environmental protection. Mass rapid transit, rather than private cars, should receive greater preference.

- **Planning considerations for new infrastructure:** Land use planning should be directed towards developing transport corridors so that urban growth takes place along such corridors and not in a haphazard manner. Emphasis should also be given to coordinated landuse and transport planning in order to encourage spatial development patterns that facilitate access to such basic necessities as workplaces, schools, health care, markets, places of worship, and leisure, thereby reducing the need to travel.

- **Provision of transport services:** Formulation of urban transport policies, therefore, should take into account the diversity in the nature of services as well as the way in which such services are organized. Such policies should be formulated through elaborate consultations with relevant stakeholders and experts.
- **Prioritization of pedestrian:** Pedestrians should be given the highest priority in urban transportation policy and planning. Accordingly sufficient provision should be kept for sidewalks. Sidewalks must be kept free of all encroachments. Some roads can be declared exclusively pedestrian walks for 24 hours or part of the day or night.
- **Informal sector transport services:** The urban local bodies should facilitate the development of effective formal and informal public transport system within regulations in order to maximize access by urban residents including the poor.
- **Non-motorized transport (NMT) modes:** In Bangladesh, non-motorized transport modes (rickshaws/vans) account for largest share of transport services (excluding walking) in urban areas, especially in small and medium towns and this is likely to continue in the near future. Rickshaws will continue to be the main transport mode in small and medium towns in the foreseeable future. Traffic rules and management in these towns, therefore, should focus on rickshaws. Use of bicycles should be encouraged, with provision of separate lanes.
- **Developing public transport alternatives:** Steps should be taken to increase the number of large-size buses including double-decker buses on truck routes and buses of optimum sizes on other routes. Introduction of Rapid Bus Transit through the use of high capacity dedicated bus lanes should be given due consideration in Dhaka and Chittagong. Rail-based mass transit systems should also be considered as parts of a long-term integrated transport strategy for Dhaka Metropolitan Area. Provision for underground metro-rail, commuter train and overhead expressway should be planned for Dhaka and subsequently in Chittagong, if necessary.
- **Strengthening linkages with cities and towns around metropolitan areas:** One way of easing pressure on housing and transportation sectors of metropolitan areas, especially the capital city, is to strengthen transportation linkages with surrounding urban centres. Comfortable bus and rail-based commuter services will encourage people to stay in surrounding satellite towns and commute to their work places in the city. This will take some pressure off the city roads.
- **Public vs. private provision:** It is recommended that the private sector operators should be mainly responsible for public bus transport, along with BRTC transport services. Such involvement should be in activities where there is competition. Private operation of bus Transport services, however, should be closely regulated and monitored regularly.
- **Circular and Intra-City Waterways:** The circular and intra-city waterways have potentials to ease the dreadful gridlock on Dhaka roads and the route can become an alternative to the existing road transportation.
- **By-pass around Major Cities:** All national highways connecting urban centres particularly the large ones should by pass the major city area. Such roads will be accommodated within the master plans as an essential part of physical planning. The land use along side such roads should be controlled to prevent urban sprawl or depletion of agricultural lands.

Environmental Policy

Environmental problems are multidimensional and cut across many sectors, mechanisms to deal with such problems are also diverse and requires combined efforts of many actors including governments, private sector and the civil society. Environmental improvement, therefore, needs a coherent combination of education, arbitration, regulation, market-based incentives, government-funded programmes and voluntary initiatives. Environmental management strategies should aim at achieving greater economic efficiency and improving cost recovery.

- **Participatory Approach to Planning and Management:** Urban environmental planning and management should aim to identify urban environmental issues, formulate strategies and actions to resolve these issues and implement these strategies through coordinated actions involving public and private authorities, community-based/nongovernmental organizations, concerned citizens and private actors.
- **Integrated Provision of Environmental Infrastructure:** Particular emphasis should be placed on the provision of complementary urban services. A combination of safe and sufficient water supply, sanitation, and storm drainage can greatly improve urban environmental health, and reduce infant and child mortality in particular. When this is combined with preventive programs, and the provision of primary healthcare and emergency services, the reduction in the toll exacted by disease and accidents can be substantial.
- **Improving the Operation of Urban Services and Cost Recovery:** Local governments should get the resource prices right and improve the ability of public utilities to recover an increasing percentage of costs from their customers so that they may extend their coverage and reduce the burden on tightly stretched municipal budgets. Cost recovery may be enhanced by improved monitoring and enforcement and by changing the rules for rate setting.
- **Recycling as a Means to Reduce Solid Waste Management Cost:** Government support for recycling through imposing user fees for waste disposal, encouraging composting, and formalizing the function of scavengers, can lead to considerable savings in the cost of processing solid wastes.
- **Establishing Public-Private Partnerships:** Privatization may be an effective means of providing environmental services in a cost-effective and efficient manner. In addition to private sector firms, community based organizations (CBOs), non-governmental organizations (NGOs) and informal sector enterprises can also provide urban environmental services. Local governments and public agencies can facilitate this by ensuring a supportive legal and institutional setting,
- **Natural Hazards and Disaster Management:** In Bangladesh, natural disasters like floods and cyclones cause extensive damage to lives and properties in both urban and rural areas. In recent years, people have become more aware about the possibility of disaster due to earthquake because of the way developments are taking place in urban areas. Serious consideration, therefore, should be given to including disaster management within urban and national development strategies

- **The Role of Community Participation in Reducing Vulnerability:** Disaster preparedness and response capabilities can be enhanced significantly through the contributions of the volunteers, local community groups and non-governmental organizations. Specific actions by local authorities, in partnership with the private sector and in close coordination *with* all community groups, can facilitate the operation of the disaster preparedness and response mechanisms in a much more coordinated but flexible manner.

Bangladesh National Environment Policy approved in May 1992, sets out the basic framework for environmental action, together sets out the basic framework for environmental action, together with a set of broad with a set of broad sectoral action guidelines.

Key elements of the Environment Policy are:

- Maintenance of the ecological balance and overall progress and development of the country through protection and development of the country.
- Protection of the country against natural disasters.
- Identification and regulation of all types of activities which pollute and degrade the environment
- Ensuring proper Environment Impact Assessment prior to undertaking of industrial and other development projects. development projects
- Ensuring sustainable use of all natural resources.

Coverage of Environment Policy 1992

Environmental activities encompass all geographical regions and development sectors of the country. As such, policies towards realization of the overall objectives of this Environment Policy are delineated in 15 sectors. These are:

- a) Agriculture
- b) Industry
- c) Health
- d) Energy
- e) water Development, Flood Control water Development, and Irrigation
- f) Land
- g) Forest, Wild Life and Biodiversity Forest, Wild Life and Biodiversity
- h) Fisheries and Livestock
- i) Food
- j) Coastal and Marine Environment
- k) Communication and Transportation
- l) Housing and urbanization
- m) Population
- n) Education and public Awareness
- o) Science, Technology and Research
- p) Fisheries and Livestock
- q) National Environment Policy, MEAs and Bangladesh

The policy recognizes that since global and regional environmental pollution and degradation affect the nature, environment and resource base of Bangladesh, is essential to have coordinated vigilance and undertake necessary action programme to address such issues. It is necessary to

undertake activities at local and national level. It is also feasible and essential to ensure improvement of national environment and thus global improvement of national environment and thus global environment at large, as well as environmentally sound and sustainable use of resource through regional and global cooperation in relevant fields.

Tourism Policy

Tourism may be considered as a vehicle for generating economic growth of a city. Bangladesh has not yet any significant study on the potentials and economic impact of tourism. As one of the many activities, tourism planning is an important consideration for earning economic benefit and getting more importance for attracting fund from nationally and internally as well.

Tourists are attracted by various natural and man-made objects. Remarkable among these are sea-beaches, archaeological and historical relics, flora and fauna, natural scenery, tribal lifestyle and the indigenous culture. There is an abundance of attractions of this kind in Bangladesh.

Aims of Tourism policy

- Increasing foreign exchange earning by attracting foreign tourist;
- Increasing interest in tourism activities the people and creating low-cost tourist facilities for them
- Development, preservation and maintenance of tourism resources of the Country;
- Taking steps for alleviation of poverty by creating employment opportunities for greater number of people
- Creating a favorable image of Bangladesh abroad;
- Opening up a recognized field of investment for private capital;
- Creating recreational facilities for foreign tourists and local people;
- Developing the handicrafts and cottage industries, consolidation of national solidarity and consensus through fostering and development of the Culture, heritage and tradition; of the country.

Strategies for Tourism Policy

- a. In order to make tourism industry popular, the socio-economic values of this industry will have to be upheld to the people and consciousnesses regarding this industry will be created by publicity through radio, television and the press.
- b. Capital will be withdrawn by phases from companies! Organizations related to tourism held by the government sector in the tourism centers of the country and steps will be taken to hand them over to the private sector.
- c. The Government allocation will be increased for publicity and promotion of tourism industry at the national and international levels through Bangladesh Parjatan Corporation so that it can play a more vital role.
- d. In order to encourage the private sector to invest in tourism industry, service-oriented organizations related to hotel and tourism have been identified as an industrial sector. For fostering this industry, capital investment at concessional interest rate and other facilities such as water, gas and electricity connections may be provided:
- e. In order to make the private sector interested in investing in tourism industry. Government land may be leased on long term basis to establish business organizations against their approved projects.

- f. With a view to import air-conditioned tourist coaches and watercrafts suitable for 15 to 20 passengers for use by the tourists, under current rules and regulations, permission may be given for the import of such vehicles by paying import taxes at easy installments as may be fixed by the National Board of Revenue, if necessary. All air-conditioned vehicles and water vessels imported under this arrangement will not be handed over to others and must be used only for tourists.
- g. Special tourist areas will be established only for foreign tourists. In order to provide accommodation, catering, games and sports, dance and music to the foreign tourists at these designated areas for required importation will be given. In these special areas the tourists will have to do all transaction in foreign currencies. Kuakata area of Patuakhali and Sonadia Island of Cox's Bazar may be designated as such special areas for the tourists.
- h. Due importance will have to be given to the development of tourism in the annual/five-year plans. At such tourist centres where the private sector is not eager to develop facilities, having developed said facilities centering round the core-projects public capital may be withdrawn gradually.

Agriculture Policy

The economy of Bangladesh is primarily dependent on agriculture. About 84 percent of the total population live in rural areas and are directly or indirectly engaged in a wide range of agricultural activities. Agriculture contributes about 32 percent to the country's GDP, about 23 percent of which is contributed by the crop sector alone. About 63 percent of the labour forces are employed in agriculture with about 57 percent being employed in the crop sector. Since crop sector plays the major role in Bangladesh agriculture and gets the top most importance in various agriculture related programmes of the government, this policy document for the development of crop sector is, therefore, titled as the National Agriculture Policy.

The primary goal of the National Agriculture Policy is to modernize and diversify the crop sector, in other words the entire agricultural system, through initiation and implementation of a well-organized and well-coordinated development plan. The overall objective of the National Agriculture Policy is to make the nation self-sufficient in food through increasing production of all crops including cereals and ensure a dependable food security system for all.

Population Policy

The objectives of the National Population Policy are to improve the status of family planning, maternal and child health including reproductive health services and to improve the living standard of the people of Bangladesh through making a desirable balance between population and development in the context of Millennium Development Goals (MDGs) and Interim Poverty Reduction Strategy Paper (IPRSP).

In terms of gender equity and equality, women in Bangladesh are in a disadvantageous position. At the household level, the girl child often has unequal access to nutrition, health care and education compare to boy child. Many discriminatory practices arise out of some deep-rooted socio-cultural factors. Women still earn less than men and are mostly occupied in low paid jobs. They often do not have easy access to credit and other income generation opportunities. In order to ensure better gender balance, the following strategies call for urgent attention:

- a) Formulate all programs, both Government and Non-Government conforming to gender sensitivity;

- b) Improve participation of women in decision-making roles at national and local levels as well as in income generating activities, including use of micro-credit, and vocational education to enable them to move beyond traditional roles and occupations;
- c) Provide child care support systems, including creches at work places in urban and rural areas;
- d) Strengthen institutional capacity and resources of the women's development related institutions and mainstream gender concerns in all sectors;

Population and Development Strategies: Population growth and distribution influence development and in turn get influenced by it. As a multi sectoral concern, population stabilization requires integration of demographic factors into the activities of health, education, women's development, urbanization, housing, environment, poverty alleviation, elimination of social and economic disparities etc. Policies and strategies of these sectors have to be consistent with the goal of population stabilization and socio-economic development. There is a need to integrate population variables in the development plans and policies of all relevant ministries in order to make public policies more population focused. The Population and Development strategies will emphasize the following four areas:

Welfare Services for Elderly and Poor: Elderly and poor constitute a significant portion of the total population in Bangladesh. Special attention is needed for their health, education and social security. Following strategies will be adopted in order to solve their problems:

- a) Introduce universal education, social security, health and family planning services for the poor with the help of government, nongovernmental and private sector institutes;
- b) Strengthen family support system through advocacy and counseling regarding responsibilities of family for elderly, physical and mental retarded members and create awareness in the light of religious values;
- c) Increase existing old age allowance and expand its coverage; and
- d) Ensure social security and free medical care for childless and helpless elderly couples

Urban Migration and Planned Urbanization: Urban population in Bangladesh is increasing at the rate of 4.0 percent per annum, largely attributable to rural-urban migration. This high growth rate is putting tremendous pressures on urban facilities and civil services, including law and order. Hence, the following strategies will be adopted to slow down the growth of urban population:

- a) Slow down the rate of migration from rural areas to Dhaka and other major cities. To this end, there is a need to mitigate the push factors from rural areas by ensuring rural employment opportunities in agriculture and agro-based industries. Simultaneously 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;
- b) Relax rules relating to going abroad of skilled workers and make provision for dual citizenship;
- c) 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;

- d) Create skilled manpower for overseas employment;
- e) Ensure coordinated and planned development of the towns and cities keeping in view the future growth of population and prevent the growth of urban slums through vigilance of administration, municipalities and law enforcing agencies, which may slow down the rate of population growth in urban areas.

Population and Environment

Rapid increase in urban population resulting in heavy traffic movement on roads in cities and towns, shortage of housing, poor water supply and sanitation facilities, air pollution etc are constantly affecting environment. Many of these problems are due to influx of rural population to urban areas. In addition, unplanned housing in the villages are being developed destroying agricultural land. To remedy these problems, the following strategies shall be pursued:

- a) Develop specific plan to discourage housing in the villages and cities by destroying agricultural lands;
- b) Strengthen social afforestation programs in villages and take appropriate steps to create a pollution free environment in all towns and cities;
- c) Ensure availability, access to safe and arsenic free water to all citizens and make the local Government responsible for taking all necessary measures. Different arsenic-free water sources shall be made available;
- d) Reduce vehicular pollution by implementing appropriate laws;
- e) Regulate the growth of slums and encourage environment friendly activities. Undertake appropriate steps through the local Government and law enforcing agencies in this regard;
- f) Undertake a cleanliness drive regularly by the Municipal Corporation and Municipalities and other civic authorities to keep cities, towns, hats and bazaars clean; and
- g) Support the programs for re-excavation of canals and ponds in rural area and to undertake measures against soil and river erosion.

Coastal Zone Management Policy

Bangladesh is the largest delta of the world having vast coastal belt. The areas affected by the three indicators of i) influence of tidal waters, ii) salinity intrusion and iii) cyclones /storm surges are recognized as the coastal zones of Bangladesh.

A total of 19 districts covering 48 Upazila/Thanas having population of 3 crore and 48 lakh covering one-third of the country belongs to the coastal zone. The districts of Bagerhat, Barisal, Bhola, Chandpur, Chittagong, Cox's Bazar, Feni, Gopalganj, Jessore, Jhalkati, Khulna, Lakshmipr, Narail, Noakhali, Patuakhali, Pirojpur, Satkhira and Shariatpur.

Coastal zone is different from other parts of the country in a number of ways and hence government has formulated Coastal Zone Policy (CZP0) that would provide a general guidance to all concerned for the management and development of the coastal zone in a manner so that the coastal people are able to pursue their life and livelihoods within secure and conducive environment.

The coastal development process aims to meet, on an overall basis, National Goal for Economic Growth, Poverty Reduction and Social Development, Code of Conduct for Responsible Fisheries etc. including to achieve the targets of the MDGs. The goal of integrated coastal zone management is to create conditions, in which the reduction of poverty, development of sustainable livelihoods and the integration of the coastal zone into national processes can take place.

Integrated Coastal Zone Management (ICZM): The main principles in ICZM approach include the following issues:

- a) integration through harmonization and coordination;
- b) adoption of process approach;
- c) linkage to national planning mechanism;
- d) implementation through respective line agencies;
- e) co-management and participatory decision;
- f) gender equality;
- g) participatory monitoring and evaluation;
- h) supporting national policy of decentralization and development of the private sector;
- i) interventions based on the best available knowledge; efforts to fill knowledge gaps;
- j) priority setting on issues of the coastal zone.

Coastal zone Policy Framework: Coastal zone policy statement is made in relation to development objectives. These policies provide general guidelines so that coastal people can pursue their livelihoods under secured conditions in a sustainable manner imparting the integrity of natural environment. In this regard effective measures will be taken to materialize the objectives of poverty reduction through promoting economic growth in the coastal zones. Policies in this respect are: Utilizing the available resources of the zones through sustainable management to uplift the standard of living of the coastal communities by investing in different sectors like- marine fisheries, salt production, shrimp culture, crab culture, shell culture, pearl culture, livestock development, area-based agricultural development and agro-based industries, transport, ship building, ship-breaking, tourism, extraction of beach minerals, renewable and non-renewable energy etc.

A Strategy shall be formulated covering all routes to development taking multidimensional nature of poverty. Priority would be accorded to (i) labor-intensive and low technology investments (ii) to promote those industries and activities that will reasonably use manmade coastal resources as basic raw materials.

- a) Settled isolated chars and islands will be brought under special development programmes;
- b) Cox's Bazar, Nijhum Dwip, St. Martin's Island and Kuakata sea beaches and Sundarbans will be further developed to attract tourists and those areas and islands will be developed as 'Special Zone for Tourism'. Private sector initiatives will be encouraged in this respect;
- c) Steps will be taken for medium and small investment in the coastal zones.
- d) Necessary measures to draw investments in the coastal zones including Direct Foreign Investment (DFI), especially by setting up more EPZs;

Basic Needs and Opportunities: The 2002 World Summit on Sustainable Development (WSSD) adopted five areas for particular focus: water and sanitation, energy, health, agriculture and biodiversity (WEHAB). The coastal zone is lagging behind in some of these key areas.

Reduction of Vulnerabilities: Majority households of the coastal zone are vulnerable to climate change. In the coastal zone, agriculture continues to be a major source of employment. So, reduction in risk factors is critical for the region.

Sustainable Management of Natural Resources: Coastal zone is full of diverse resources: inland fisheries & shrimp, marine fisheries, mangrove and other forests, land, livestock, salt, minerals, sources of renewable energy like tide, wind and solar energy. Medium and long term Government policy to ensure sustainable management of both biotic and abiotic coastal resources will be adopted for coastal economy as well as national economic development.

Empowerment of Communities: Mainstreaming of the coastal people will be done by enhancing their safety and capacity. In this context, proper government policy will be adopted.

Women's Development and Gender Equality: It is recognized that gender inequalities and gaps exist in the coastal zone, in particular in the fields of access to livelihoods, assets and resources. Malnutrition, heavy domestic workload and other gender issue that affect women's life and limits their participation is personal insecurity, more serious in remote coastal areas. Enabling cultural and institutional environment is necessary to remove the hurdles to mobility of women.

Water Reservoir Protection Act

As water is essential for human survival, socio-economic development of the country and preservation of its natural environment, it is the policy of the Government of Bangladesh that all necessary means and measures will be taken to manage the water resources of the country in a comprehensive, integrated and equitable manner. The policies enunciated herein are designed to ensure continued progress towards fulfilling the national goals of economic development, poverty alleviation, food security, public health and safety, decent standard of living for the people and protection of the natural environment.

The water policy of the government aims to provide direction to all agencies working with the water sector, and institutions that relate to the water sector in one form or another, for achievement of specified objectives. These objectives are broadly:

- a. To address issues related to the harnessing and development of all forms of surface water and ground water and management of these resources in an efficient and equitable manner
- b. To ensure the availability of water to all elements of the society including the poor and the underprivileged, and to take into account the particular needs of women and children
- c. To accelerate the development of sustainable public and private water delivery systems with appropriate legal and financial measures and incentives, including delineation of water rights and water pricing
- d. To bring institutional changes that will help decentralize the management of water resources and enhance the role of women in water management.
- e. To develop a legal and regulatory environment that will help the process of decentralization, sound environmental management, and improve the investment climate for the private sector in water development and management
- f. To develop a state of knowledge and capability that will enable the country to design future water resources management plans by itself with economic efficiency, gender equity,

social justice and environmental awareness to facilitate achievement of the water management objectives through broad public participation

Water for Preservation of Haors, Baors, and Beels

Water bodies like haors, baors, and beels are precious assets of Bangladesh with unique regional characteristics. Apart from their scenic beauty, they have great economical and environmental value. Even during extremely dry seasons, when the smaller beels turn into quagmires, the haors and the baors retain considerable amount of water. These water bodies account for a large share of the natural capture fisheries and provide a habitat for a wide variety of aquatic vegetation and birds. They also provide sanctuary to migratory birds during winter. The haors and the beels usually connect to some adjoining river through khals.

In order to carry out the preparation of master plan for the Chandanaish Pourashava following policy of the government keeping in mind.

- a. Natural water bodies such as beels, haors, and baors will be preserved for maintaining the aquatic environment and facilitating drainage.
- b. Only those water related projects will be taken up for execution that will not interfere with the aquatic characteristics of those water bodies.
- c. Haors that naturally dry up during the winter will be developed for dry season agriculture.
- d. Take up integrated projects in those water bodies for increasing fish production.
- e. Natural water bodies will be developed, where possible, for recreational use in support of tourism.

5.2 Laws and Regulations

5.2.1 Urban Development Control

Development control is not effective in our country due to lack of enforcement by the concerned authorities as well as ignorance on the part of the citizens. In absence of effective development control, violation of land use zoning has become very common. In this process use of a particular land use zone is violated by placing non-permitted use structure in that zone. Setting up industry in residential zone or commercial zone or open space designated area is example of this type of unauthorized development. This type of violation may take many other forms. Land use violation greatly diminishes the use value of particular zone thereby disturbs the living and working environment of towns and cities.

Development control may be imposed at several stages. For effective control, building construction permit process may undergo following stages.

- Site Selection Stage
- Design Completion and Building Approval Stage
- Construction Stage
- Use Stage

Important urban related laws and regulation such as building construction act, rules and regulation of different development authority are describe as follows:

Building Construction Act 1952, 2004

The Town Improvement Act 1953: City area is changing continuously through development activities by different actors like government agencies, private developers, individuals and others. Planned urban growth is mainly based on the development control measures. Land use control in urban areas of Bangladesh is initiated with the adoption of the Town Improvement Act 1953.

The East Bengal Building Construction Act 1952: The East Bengal Building Construction Act, 1952, (amended 1987) is also considered a legal document for development control. Rules, regulations and ordinances of the City Authorities are also being exercised for this purpose. Every construction requires permission as per provision of 'The East Bengal Building Construction Act 1952 (amended 1987) (EBBC Act 1952)'. The developing agencies are empowered for planning permission and approval of building plans and prevent illegal constructions in the metropolitan areas.

Land Use Planning Rules: Statutory rules control land use according to planning standards. It is based on land use policies including local plans, such as control of residential density, road standard, maintenance providing of infrastructure and services. The acts and the master plans of the cities are the principal legal instruments, which force and exercise planning control and standards.

The land use of metropolitan Dhaka ought to follow the provision of the City Master Plan. Housing, commercial and industrial project buildings need planning permission, which are generally practiced. It must be in conformity with the land use provision of the Master Plan.

Building Construction Rules: According to the East Bengal Building Construction Act-1952 (amended 1987), each and every building within the designated areas of City 'Master Plan' needs approval from the City Development Agencies. As per Acts, the definition of building is: 'Building includes a house, hut, wall and any other structure where of masonry bricks, corrugated iron sheet, metal tires wood, bamboo, mud, leaves, grass, thatch or any other materials whatsoever'.

The Act has empowered to initiate building rules under section 18, EBSC Act 1952 which has been updated, based on public interest, regularly since 1954, (in 1984, and in 1996). It has been formulated through the Government of Bangladesh exercising the power of the Act.

Existing Planning, Development and Control of RAJUK, CDA and RDA

There are 6 city corporations in Bangladesh: Dhaka, Chittagong, Khulna, Rajshahi, Sylhet and Baisal. Due to rapid urbanization in 4 of them separate Development Control Authority (Dhaka, Chittagong, Khulna, Rajshahi) namely Rajdhani Unnayan Karttripakka (RAJUK), Chittagong Development Authority (CDA), Khulna Development Authority (KDA) and Rajshahi Development Authority (RDA) have also been created. All these development authority are autonomous organizations under the Ministry of Housing and Public Works.

Rajdhani Unnayan Karttripakha (RAJUK)

Originally RAJUK comprised of an area of 320 sq ml. Subsequently it has been extended to 590 sq ml. Following are the components of RAJUK:

Physical Development: Planning is the fundamental issue in the process of city development. During plan preparation RAJUK follows certain principles, which include National Urban Policy, Project Design, Planning, Multi Sector Investment Program and existing Policies and Programs of different Agencies.

Construction: RAJUK is one of the lead "Construction Actor" in the development process of Dhaka. The main activities include construction of roads, box-culverts/culverts and bridges and also development, excavation and filling of land.

Planning and Designing: Planning and design are the basic stage of construction. Project preparation, feasibility study, project programming and time scheduling are directly under the planning component.

Authorized Sections and Building Construction (BC) Committees: RAJUK has a Development Control Section (Authorized Section). Previously this section was comprised with two Authorized Officers, two Assistant Authorized Officers, four Chief Building Inspectors, 50 Building Inspectors and other staff. Now the number of Authorized Section increased in four (4) instead of two (2) by increasing the staff members and demarking the areas specified under control of each authorized jurisdiction. These sections are supported by the four Building Construction (BC) Committees headed by the Members (Planning and Development) for approval of the building plans and exercising the powers of the Act for planned growth of the city.

Other Activities: RAJUK as a prime Planning Authority represents Bangladesh as well as Dhaka City in various National and International Seminars, Symposiums and Workshops held in home and in abroad. RAJUK tries to incorporate and share the ideas and concepts related to planning and development adopted or practiced in different part of the World. RAJUK participates in various training programs to improve the organizational capabilities. RAJUK organize Seminars and Workshops on different urban issues in regular basis, the seminar on World Habitat Day is an example.

Legal Aspects: A National Legal Consultant needed to be engage for an appropriate period to: Prepare a legislative framework for the metropolitan level governance structure for Dhaka. Prepare a legal framework for adoption of the Plan. Draft suitable national legislation or legal instruments enabling land re-adjustment schemes to be undertaken in Dhaka.

Land Use Clearance and Deviation in Plans/Constructions: Land use clearances have found some or major deviations when constructing the buildings and seemed to be regular practice almost in every cases of approved plans. These happened due to non-applications of powers and lack in enforcement of building constructions rules and regulations. Negligence in duties, intention to forgo some specific cases, poor inspection and reporting and political influence made Authorized Section a fearsome part of the organization. In case of some critical issues, clients or developers some how manage the authority for land use clearances for particular areas where development is restricted for specific purpose. Peoples claimed that the files/plans are not approved properly and sites are not inspected as per given parameters. The unnecessary harassment or time killing or missing of specific files or put objections on files are most common practice dealing the Authorized Sections. The overall performance of this section is not up to the mark as mentioned by the clients.

In some cases the process of plan or building construction approval or clearance delayed due to some undefined circumstances and caused peoples to take alternative solutions. Misuse of power and Act also shown by the Authority as claimed by the clients create unnecessary harassment and delay. The provisions of Act clearly defined that the plans should be forwarded for clearance or approval within 45 days and if, any objection made in the plan must be notified within 30 days after submission for approval. In fact the process sometimes take more time as specified in the Act and in many cases it takes years to get the approval. RAJUK's Authorized Sections are carrying out

and dealing the process of development control and responsible for issuing land use clearance or approval for building plans under the provision of TI Act.

Building Heights and Regulation: Civil Aviation Authority is now very much worried about building heights and high-rise constructions within the city area and trying to solve this problem as early as possible. Though they are not submitted any clear proposals defining or indicating the buffer where the developments to be controlled. Civil Aviation Authority not asking RAJUK for any clarification about height zone or land use clearance procedures for high rises or not given any guidelines for height restrictions. Meanwhile RAJUK is trying to develop, include and enforce some legal frameworks to limit building heights and constructions of high rises.

RAJUK has taken the issue seriously and making liaison with the concern authorities and departments to incorporate the ideas and suggestions for better control and check the growing tendency of high-rise buildings in and around the region close to the air traffic and vulnerable areas.

There is need to be defined a clear, understandable and implement oriented rules and regulations to restrict building heights in specific/restricted areas.

Department of Environment (DOE) has imposed objection and made restrictions over land use clearance for high-rise buildings to protect environmental hazards and degradation of environmental quality and thus asked for prior approval. There is no such restriction imposed for constructing buildings up to 6-storied, but need prior approval from concern agencies and departments those who provide urban services and facilities.

Chittagong Development Authority (CDA)

Chittagong Development Authority (CDA) was established in the year 1959 in order to ensure the planned and systematic growth of the city. The development of Chittagong has substantial impact on the overall development of Bangladesh. The major functions/activities of this authority are as follows:

- Preparation of master plan for Chittagong city and the area in the vicinity and its continuous review.
- Preparation of short term and long-term development programs for improvement and expansion of Chittagong city. This includes construction of new roads, widening and improvement of major city roads, construction of shopping complex, development of industrial and residential estates and commercial plots and other necessary urban developments.
- Exercising planning control over the structure plan as per provision of CDA Ordinance and Govt. approved Master Plan.
- Development control within the preview of Bangladesh Building Construction Acts, 1952 with its subsequent revisions.

CDA is a statutory authority controlled by Ministry of Housing & public works. All the activities administers by a Chairman. There is a board, headed by the Chairman. The board includes 11 other members from diversified fields.

Constitution of Present Board: Chairman- appointed by the government and board members listed below:

- Chairman of Chittagong Water Supply & Sewerage Authority (WASA)
- Deputy Commissioner of Chittagong.
- Four member nominated by the government.
- A representative of the Chittagong Chamber of Commerce & Industries.
- A representative of Bangladesh Railway board.
- A representative of Chittagong Port Authority.
- Two members nominated by the Mayor of Chittagong City Corporation.

A total of 520 personnel are working at CDA. They include Architects, Engineers, Planners, and Administrators, land Surveyors etc.

Planning: The first regional plan of Chittagong was prepared in 1961 for an area of 549 sq. km by a British town planning consulting firm. The city extends up to 35.40 kms from north to south and 20.92 kms east to west at its widest, within the regional plan boundaries an area of approximately 259 sq kms was identified as Master plan area. Till 1999 planning activities in Chittagong governed by this 1961 Master plan.

Subsequently in the context of existing situation of Chittagong, CDA took up a project, "Preparation Structure Plan, Master plan and Detailed area Plan of Chittagong", with UNDP/UNCHS financial and technical assistance in the year 1993. The new Metropolitan master plan was approved by Government of Bangladesh on the 1st of March 1999. Now the extent of new master plan' limit is 1152sq. Kilometers.

Rajshahi Development Authority (RDA)

19th October of 1976 the Government of Bangladesh established Rajshahi Development Authority (RDA) for planned development of Rajshahi City and its vicinity. Initially the Authority has started its works for 177 sq.km (including 108 Mouzas), which is extended to 364.19 sq.km in 2004 with the gazette notification of Rajshahi Metropolitan Development Plan. The Authority is performing its duties following the Rajshahi Town Development Authority Ordinance, 1976 (Ordinance No. LXXVIII of 1976). The whole development works are monitored by the Ministry of Housing and Public Works of the Peoples' Republic of Bangladesh.

1. The aim of the Authority is to formulate and execute plans and schemes for the development of Rajshahi and its remote area.
2. The Authority is also responsible to control the undesirable growth of the city by executing the land use zoning and National Building Code, 1952.
3. RDA is also collecting and updating spatial as well as spatial data and also supplying those data by map.

5.2.2 Pourashava Development Management

Pourashava Ordinance covered the constitutional or legal provision for governance issues of Pourashava management. The Pourashava Authority shall exercise the spatial development control in the following manner.

- No person shall erect or re-erect a building or commence to erect or re-erect a building unless the site has been approved, and the building plan has been sanctioned by the Pourashava.
- A person intending to erect or re-erect a building, shall apply for sanction in the manner provided in the by-laws, and shall pay such fees as may be levied by the Pourashava with the Previous sanction of the Prescribed Authority.
- All building applications presented under this section shall be registered in the manner provide in the by-laws, and shall be disposed of as possible, but not later then sixty days from the date of the registration of the application and if on order is passed on an application within sixty days of its registration, it shall be deemed to have been sanctioned to the extent to which it does not contravene the provisions of the building by-laws, or of the Master Plan or Site Development Scheme, if any.
- A Pourashava may, for reasons to be stated in writing, reject a site plan or a building plan, but any person aggrieved thereby may appeal to the Prescribed Authority within thirty days of the order of rejection, and the order passed by the Prescribed Authority in appeal shall be final.
- A Pourashava may sanction a site plan or a building plan subject to such modifications or terms as may be specified in the order of sanction. .
- Nothing in this section shall apply to any work, addition or alteration which the Pourashava may, by-law, declare to be exempt.

5.3 Strength and Weaknesses of the Existing Policies

Existing Policy envisions strengthening the beneficial aspects of urban management 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. The policy also envisions a decentralized and participatory process of urban development in which the central government, the local government, the private sector, the civil society and the people all have their roles to play. The policy, therefore, should cover spatial, economic, social, cultural, aesthetic and environmental aspects of urban life directed towards achieving an urban reality that can ensure freedom from hunger and poverty; capacity to live a healthy life; access to education, shelter, and basic services, and a secure and liveable environment at home and at the workplace.

In the context of weakness, the policy was not formulated in bottom-up approach. This is why local people's views were not properly reflected. This will eventually ensure the participation of grass root people in policy formulation process. On the other side, law enforcing agencies are reluctant to foresee the urban development management system.

Contravention of plan provision is quite common. Though there is provision of penalty for plan violation in the relevant Acts and Rules, hardly this is applied. For this reason plan violation is a very common feature. Penalty in any form should be stringently imposed according to the nature of violation in order to prevent violations in the future.

Chapter 6: Critical Planning Issues

6.1 Transport

Most of the roads are Semi-pucca or katcha and needs to be made pucca or at least semi-pucca. Katcha roads become clayey in the rainy season and bring immense sufferings for the users. As a result, social, cultural and economic activities are disrupted significantly at that time. Water way transportation and railway station is not available within the Pourashava.

There is no designated parking in the Chandanaish Pourashava except central bus and truck terminal. Most of the traffics are parked haphazardly beside the road sides and in the junction point of the major road. Major three roads of the Chandanaish Pourashava have lacking of footpath. Pedestrians movement takes place on the carriage way and sides of the roads. Rickshaw, Baby taxi and traffic are taking their parking on the road sides with their management. Encroachment into road significantly reduces the lane width or scope for construction of addition lanes to enable smooth flow of traffic.

As the Arakan Highway (Chittagong to Cox's Bazar National Highway) is passing through the Pourashava so during tourist season of Cox's Bazar, it may create congestion for the traffic generated within the Pourashava.

6.2 Environment

The major environmental problems in the project area are related to drainage system, sanitation, solid waste management, industrial waste disposal, water pollution and social environment.

At present few drains exist in the Pourashava area. But these are not sufficient to deal with surface runoff. The pourashava is most vulnerable due to flash flood. Heavy rainfall also causes water logging in the eastern areas.

There are several problems were identified pointed as following manner:

- Uncontrolled conversion of low lying areas to urban land through landfill
- Encroachments of natural canals
- Absence of effective surface drain system
- Uncontrolled and indiscriminate disposal of solid waste into khals and drains
- Lack of proper operation and maintenance of drainage system
- Lack of awareness of people about the need and function of drainage system

6.3 Landuse Control

The Pourashava center and its surrounding areas are still predominantly rural. It has not attained its true urban character and it is fast transforming into an urban area. Uncontrolled and scattered developments are taking place in and around the Pourashava area. But the institution on which this responsibility of development and development control will has inherent weaknesses.

Frequent flood and water logging is the common disaster of the Pourashava. Therefore, it is difficult to control the development of commercial and industrial activities in the western part of the pourashava.

6.4 Disaster

Tropical cyclones, thunderstorms, tropical depressions are the common types of storms that occur in and around the Pourashava at different times of the year. Several destructive cyclonic storms have visited Coxsbazar and Chandanaish due to its tropical location. A tropical cyclone is generally born in the warm moist air overlying the ocean south of latitude 20°. Cox's Bazar and Chandanaish has suffered severely cyclonic storm-wave at different times when its direction moves towards the Chittagong and Cox's Bazar. Most striking features of the cyclone are the centre and the magnitude of the storm area.

These two causes produce a large accumulation of water at and near the centre, which progress with the storm and give rise to a destructive storm-wave when centre reaches the shelving coast. It then sweeps inland and wide-spread damage is occurred. Chittagong and Cox's Bazar are considered the points of landfalls of cyclonic storms. Affected areas from these points are considered the nature of damage of the cyclonic disaster.

6.5 Laws and Regulations

Pourashava Act has provided the authority to enforcing laws and regulations for development and control of the Pourashava through draw up a Master Plan. In a true sense, people care little about compliance of abiding rules regarding use of land under the control of development authorities. This is mostly due to lack of enforcement by the concerned authorities as well as ignorance on the part of the citizens. In absence of effective development control, violation of land use zoning has become very common. Landuse violation greatly diminishes the use value of particular zone thereby disturbs the living and working environment of the Pourashava.

It is mandatory to take development permit for all structures within the jurisdiction of any development authority. It is found that compatible structures are built within a landuse zone for which development permit has not been obtained. This is mostly due to weak development control in the one hand and harassment has to face by permit applicant during the plan approval process on the other hand.

Chapter 7: Land Use Zoning Policies and Development Strategies

7.1 Strategies for optimum use of Urban Land Resources

The existing form of the Pourashava area is predominately rural in nature. It has not attained its true urban character and it is fast transforming into an urban area. Uncontrolled and scattered developments are taking place in and around the Pourashava area. In this situation the main challenge of the spatial growth is to strike a balance between urbanization and the existing agrarian setting.

Chandanaish Pourashava is an urban centre in Chittagong Zila. Due to its locational advantages through roads, it has good potential for urban development. Goods can easily transport in the other regional cities of the country through road network both Chittagong and Dhaka. Since new offices of the government for different departments, allied institutions and agencies have sprung up in the Pourashava centre to achieve development activities. As a result, creation of substantial rise of the number of jobs will promote immigration in the remote future which will necessitate more areas for housing and service sector activities. On the other hand for the sustenance of the existing strong agricultural base in the form of fish processing and culture, it is not desirable to invade more agricultural land of the project area. Thus following strategies guide the spatial development planning of the project area for the next 20 years (2011-2031).

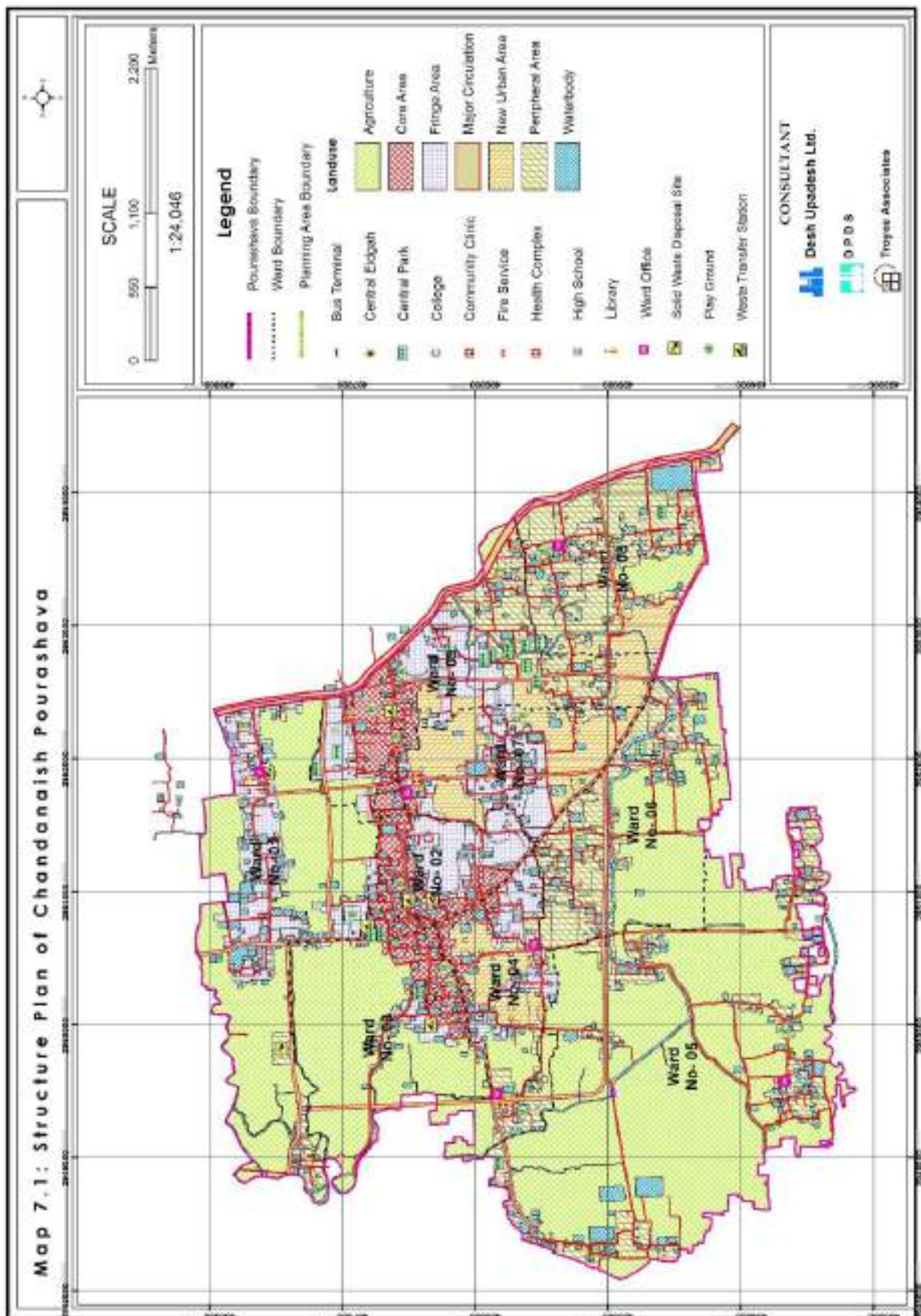
- a) Landuse zoning approach to ensure proper functioning of the area
- b) Densification approach to minimize the conversion of scarce land
- c) Ensure the highway functions and connectivity of the functional areas
- d) Secure drainage areas to protect from hazards of water logging
- e) Promote the present trend of agro-based industries within growth centers
- f) Chittagong Sea Port helps to promote of export-import business as well as setting up new industries around the Pourashava.

Table 7.1 shows the Structure Plan area zones, its area and percentage coverage.

Table 7.1: Structure Plan Policy Zoning

Zoning	Description of the Zone	Area (acre)	%
Core Area	This area is also known as built-up area. This is defined as the area which has the highest concentration of services; it also has the highest population concentration and density. It will absorb most population growth during the Land use Plan (2011-2021) period.	230.98	4.94
Fringe Area	This zone is developing areas which will take further decades to reach the population densities of the urban core area. Low initial densities in these areas do not justify supply of a full range of services as they will initially be underused. However, it is essential that planning and reservation of rights of way, at least for primary networks, be undertaken soon to enable provision when justified by increased density levels and allowed by resources.	537.03	11.48
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.	381.78	8.16
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.	313.62	6.71
Agriculture	Agricultural land (also <i>agricultural area</i>) 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.	2120.39	45.34
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.	381.78	8.16
Major Circulation	Major circulation contains major road network and railways linkage with regional and national settings	290.93	6.22
Total		4676.46	100

To guide long term growth within the Structure Plan Area by means of demarcation of the future growth areas and indication of potential locations of major development zones are broadly classified into seven categories. Details of the description of structure planning zones are given in the following paragraphs. *Map 7.1* and *ANNEX-10A* shows the structure plan of Chandanaish Pourashava.



7.1.1 Core Area

Core Area covers 230.98 acres of total land, which 4.94% of Structure Plan area of Chandanaish Pourashava (Map 7.1 and Figure 7.1). It is located within Ward no. 2, 3 and 4. It includes the highest concentration of service area for an example schools, colleges, post office, police station, Chandanaish bazar area etc. excluding upazila health complex, upazila complex and it has the highest potentiality of development. Because the town developed based on the Chandanaish wholesale market, which is located middle of the pourashava area. Within this area, there are differences in levels of provision, particularly between the formally developed and planned areas and the majority of unplanned areas. Levels of provision should be maintained in the planned areas. Since these areas are forecasted to show density increase and increased demand and therefore will require regular upgrading. The main thrust to improve services should be in the unplanned zones, particularly where the deficiencies already are great and quality of life will sharply decline when the services also have to cater for the additional population.



Figure 7.1: Total Core Area of Chandanaish Pourashava

7.1.2 Fringe Area

A total of 537.03 acres of land covering 11.48% of Structure Plan area is declared as Fringe Area (Map 7.1 and Figure 7.2). Maximum fringe area of proposed structure plan is located in the North-East side to middle of the Pourashava. It covers large portion of area of Ward no. 1, 2, 3, 4, 7 and 9. A very small portion of fringe area is located in Ward no. 3. Ideally, it might be reasonable to provide primary infrastructure networks in this area to foster development encouraging a more rapid urbanization in a planned way.

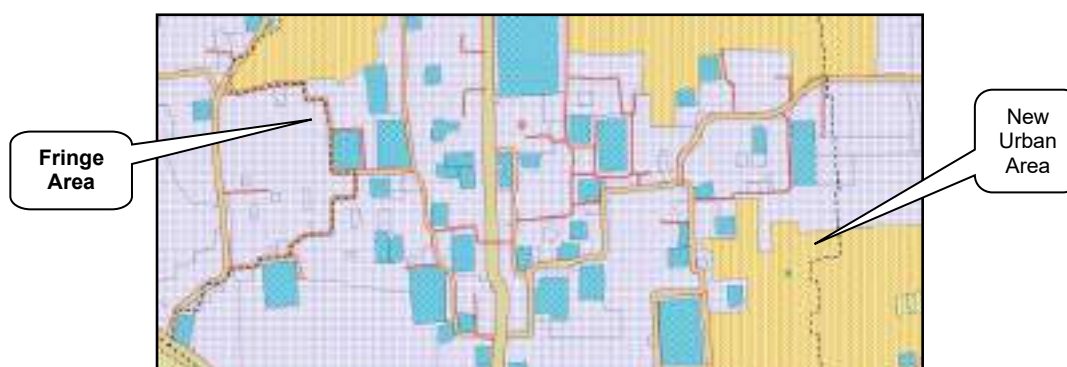


Figure 7.2: Proposed Fringe Area of Chandanaish Pourashava

7.1.3 Peripheral Area

A total of 801.73 acres of area, which covers 17.14% of Structure Plan area, is declared as Urban Peripheral Area (*Map 7.1 and Figure 7.3*). Maximum peripheral area is in Ward no. 8 and 9 in South-East side to middle of the Pourashava, although some of this area also exists in Ward no. 1, 3, 5 and 7. This zone is developing areas that will take a longer time to reach the population densities of the urban core area. Low initial densities in these areas do not justify supply of a full range of services as they will initially be underused. However, it is essential that planning and reservation of rights of way, at least for primary networks, be undertaken soon to enable provision when justified by increased density levels and allowed by resources.

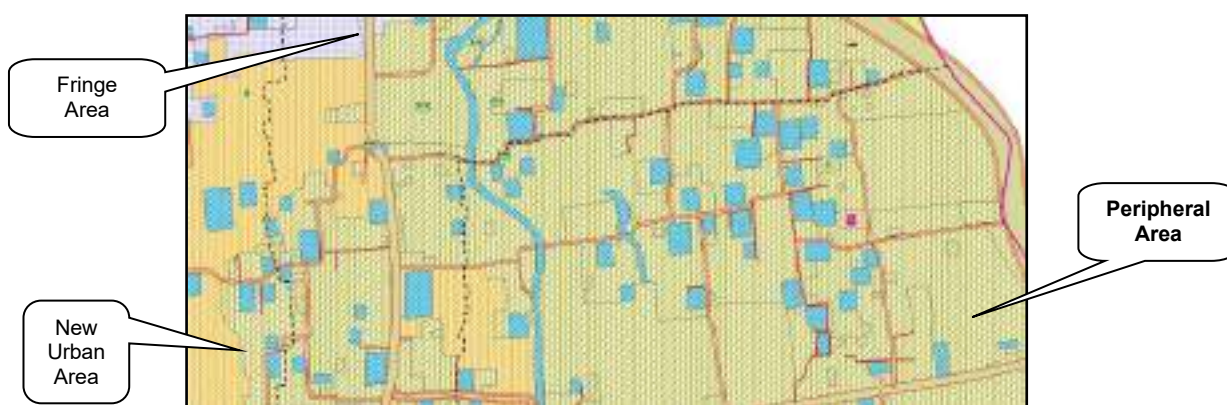


Figure 7.3: Proposed Peripheral Area of Chandanaish Pourashava

7.1.4 New Urban Area

Total 313.62 acres of land covering 6.71% of Structure Plan area is declared as New Urban Area (*Map 7.1 and Figure 7.4*). New urban area mainly proposed in the east side to middle of the Pourashava and mainly in the Ward no. 2, 4, 7 and 9. It is assumed that town will be developed based on the establishment of a trade center which is mostly depends on successfully utilize of the nearest Chittagong sea port and Cox's Bazar. So most of the new urban lands in Ward no. 2 and 4 will be use to meet the extra pressure of development trend for this reason. A large portion of land in Ward no. 09 will be used to establish future planned urban development as per population projection.



Figure 7.4: New Urban Area of Chandanaish Pourashava

7.1.5 Agriculture

Total 2120.01 acres of land covering 45.34% of Structure Plan area is declared as Agriculture Area (*Map 7.1 and Figure 7.5*). A large portion of the pourashava from North-East side to South-East side and majority of the Western portion is declared as agriculture area.



Figure 7.5: Agriculture Land of Chandanaish Pourashava

7.1.6 Water body/ Retention Area

Total 381.78 acres area, which covers 8.16% of Structure Plan area, is declared as water body (*Map 7.1*). It includes 707 ponds with an area equal to or more than 326.11 acres and all the canals and other water bodies within the Pourashava. More detail information is provided in Chapter 12 of drainage and environmental plan.

7.1.7 Major Circulation Network

It contains major road network with Chittagong and Cox's Bazar and other neighboring urban centers and also includes the major road way network required for maintaining existing internal communication. Total 290.93 acres of land which covers 6.22% of total structure plan area. *Map 7.1* shows major circulation network.

7.2 Plans for New Area Development

Only 18.92 Sq km area of the Chandanaish Pourashava is not enough to provide future development. New area will be needed to accommodate the development trend of future expansion. As per projection, the population density of the project area is not going to increase substantially during the plan period 2011-2031. Density increase will depend on the creation of new jobs and entail migration.

Assumption has been made that the natural increase of population will be absorbed within the present urban and rural settlements. Chittagong and Cox's Bazar are closely interconnected with the Pourashava. Export of agricultural products from this pourashava to the local market of Chittagong and Cox's Bazar will create a new expansion of business and industrial activities that will be developed linearly along North-South direction in the Ward 03 of the Pourashava.

Therefore, access facilities and cross link will be needed to improve within the catchments area so that people can easily come and go to growth centre to fulfil/ mitigate their needs. Moreover,

growth centers shall also have to be linked with other growth centres for exchanges of commodities and services without delay and at comfort.

Policy	Strategy	Justification	Means of Implementation	Implementing Agency
Policy UAP/01- New Area Development To promote land subdivision of the selected area and provide necessary infrastructure and services in a planned way.	The Promoting Development Strategy for this urban sub area is to adopt policies which will accelerate development at the potential areas commensurating the existing physical trend of growth. This will release the population pressure from the core area, accommodate population growth in the long term up to the 2031 and ensure planned development.	Fringe areas under slow development offer excellent opportunity for planned development by means of land subdivision and infrastructure development. Peripheral areas also offer excellent opportunity for organized development with little or no compensation cost for eviction and less hindrances in motivation of the local residents in favor of organized development	Land acquisition should be done through the initiative of Pourashava Authority, then land preparation, land subdivision, earthwork will be furnished. New facilities and services like road, drains, footpath, waste transfer station and other civic services will be provided by involving the concerned agencies. Involvement of public sector along with private sector and NGO's or PPP (Public Private Partnership) may be a innovative concept for financing in this respect.	<ul style="list-style-type: none"> – Chandanaish Paurashava – LGED – RHD – PDB – REB – DPHE – NGOs

7.3 Areas for Conservation and Protection

The predominant use of land is for agriculture. Densification approach will apply to minimize the conversion of agricultural land. The existing rural settlement areas, urban designated areas and the rural growth centers are large enough to accommodate all the expected development for a long period of time. On the other side, currently land throughout the country has come under speculative purchase for future gain. In order to prevent speculative purchase and sale of land and unnecessary conversion to non-agricultural use, the division of entire area into rural, urban and conservable areas will be an effective safeguard. Therefore, landuse zoning is an effective approach to conserve and protection the potential agricultural land.

The Pourashava area suffers from drainage congestion which results in water logging during rainy season. In order to mitigate this problem, strategy has been drawn to utilize the canals of the area as retention area of rainfall runoff. These should be conserved and protected against the encroachment from other use. Canal area is proposed to be re-excavated, linked and developed to a system of network.

To ensure livable environment in the planning area, different areas are conserved in various forms, namely agricultural land, low land, pond and natural drainage, green belt, historic and heritage areas etc. Details are given in *Table 7.2*.

Table 7.2: Area for conservation and protection

Type of Land	Means of Implementation	Implementing Agency
<p>Protect The Productive Agricultural Land: The high value agricultural land should be protected from conversion into inefficient and unproductive urban land. These areas will be conserved and promoted as areas of high intensity food production in order to ensure urban food security in close proximity to the town and improve the income level within agricultural sector of the Pourashava' s economy.</p>	<p>The EIA Guidelines of DOE emphasized on the avoidance of productive agricultural land for any development project. Therefore, it will be wise to consider more economical use of land to avoid fertile lands. The town expansion and land acquisition should be based on the growth rate of population. According to population projection for the year 2031, the present residential land use area will grow with increasing density. So a large share of agricultural land can be spared at least for the time being.</p>	<ul style="list-style-type: none"> – Chandanaish Pourashava – DOE. – Department of Agricultural Extension
<p>Low Land, Pond and Drainage Path: A total of 707 ponds with an area equal to or more than 326.11 acres within the Pourashava are declared as retention area. The ponds with area more than 326.11 acres, lakes, canals, river, beels must be protected as water body from encroachment and conversion into other use. The permission for filling up of these ponds should not be given without any special case. These water bodies should be protected for the purpose of using them as retention pond and drainage channel. Pourashava should acquire these ponds at suitable time to use them for retention and emergency use.</p>	<p>This area is declared as water body in the Master Plan. As per the guideline of Wetland Conservation Act 2000, this area will be conserved as water body. According to population projection for the year 2031, the present residential land</p>	<ul style="list-style-type: none"> – Chandanaish Pourashava – Water Development Board (BWDB) – Local Government Engineering Department (LGED)
<p>Preserve and conserve the heritage sites: To preserve the heritage sites in the Pourashava area without any change and conserve with controlled modifications and alterations.</p>		<ul style="list-style-type: none"> – Chandanaish Pourashava – Department of Archeology – Bangladesh Parjatan Corporation

Chapter 8: Strategies and Policies for Sectoral Development of the Pourashava

8.1 Socio-Economic Sectors

8.1.1 Population

Population projection has been made on the basis of growth trend observed in the past consecutive censal periods. The growth rate indicates steady downward trend. Thus it is found that at the end year of the plan period i.e. 2031 the populations of the Pourashava area will be 101,498 persons. This indicates a net increase of 26,139 persons over the 2011 population.

Policy 1: Expected population growth and changes in its socio-economic and age structure should be taken into account for future development initiatives.

Policy 2: To ensure rational distribution of population within the planned area. Chandanaish Pourashava authority will pursue the policies required to achieve the spatial development strategy.

Policy 3: In order to ensure better gender and child care balance, institutional capacity and resources of the women's development related institutions and mainstream gender concerns in all sectors should be strengthen; attention will be given to child care support systems, including crèches at work places in urban and rural areas;

Policy 4: Population control in the Pourashava: Increased population might be a great problem for Chandanaish Pourashava due to proximity to Chittagong and Cox's Bazar. Organizing different types of strategic policies will help to control the growth trend of population.

8.1.2 Economic Development

Development of the local economy has now emerged as an issue of considerable significance in view of growing poverty, increasing unemployment and deterioration in the quality of life in cities and towns. The economic base of an urban area is an indicator of its economic strength. Some of the mechanisms that can be used to support local economic development include the following activities.

Policy 1: The Pourashava authority will create an environment conducive to supporting local economic development. Small, medium micro enterprises will receive maximum support of investment and guidance in this regard.

Policy 2: Vocational/ technical learning programmes may entail on-the-job training; training through local agencies for specific businesses; training in areas of potential labour shortages; and general skill training, such as literacy and job searching skills.

Policy 3: Specific zones may be created through land use planning for different types of industries for small, medium and micro-enterprises.

Policy 4: Growth centers are functioning as places of economic activities for the local people. To facilitate economic activities in the growth centers all the growth centers needs to be covered by electricity provision.

8.1.3 Employment Generation

Employment generation will be depended on the creation of industries, establishment of growth centres and development of services in the Chandanaish Pourashava. Service industry will be emerged with a new dimension the availability of better infrastructure and better transportation and communication network. Fish processing industry already developed and associated commercial activities are flourishing along with the major road sides of the pourashava.

Policy 1: The Pourashava is still rural area in nature. Provision of agro-based industries will provide ready market of agricultural products to the community and will increasing employment opportunity as well.

Policy 2: In order to create further employment opportunities beyond the agricultural sector, initiatives should be taken to set up small, medium and large industries in and around the Pourashava.

Policy 3: Eestablishment of community business and cooperatives in the Pourashava will be strengthening the Pourashava economy and creating additional employment opportunities.

8.1.4 Housing and Slum Improvement

Majority houses in the study area are thatched representing 37.7 percent of the total houses and about 20.1 percent are single storied buildings. As per projection, the population density of the project area is not going to increase substantially during the plan period 2011-2031. Assumption has been made that the natural increase of population will be absorbed within the present urban and rural settlements.

Housing shall have to be designed in such a manner so that people can come close to each other. These can be achieved through creation of some common facilities and even the building and lot design will allow easy mixing of people. Moreover, neighborhoods/rural residential clusters should be free from heavy and through traffic. To improve the housing and slums following policy should include:

Policy 1: To accommodate the housing demand either horizontal or vertical expansion will be first option.

Policy 2: Promotion of self-built housing within the context of a comprehensive land-use policy and development of the means and methods to improve the standards of self-built housing.

Policy 3: The Pourashava will provide the urban poor with access to infrastructure and services to all inhabitants of slum/informal settlements.

8.1.5 Social Amenities and Community Facilities

The Pourashava area is predominantly rural. Community services and social amenities are not developed significantly. The rapid urbanization of the Chandanaish Pourashava has been urged to develop social amenities and social community facilities. The growth of urban areas has consistently been faster than the growth of social infrastructure to service the population. As a result, large sections of the urban population have no access to health and education facilities. As far as literacy is concerned, urban areas show better statistics than rural ones, with a literacy percentage of 74.7 for urban areas against 53.6 percentages for rural areas. But Iliteracy rate of Chandanaish Pourashava is higher than the national average (62.0 percent). However, community services and social amenities in the Pourashava include following policies:

Policy 1: Ensure planned and equitable distribution of community services and social amenities facilities in appropriate locations in the Pourashava.

Policy 2: Promote hierarchical structure of educational institutions, such as from the kindergartens to universities, at appropriate locations with catchment areas/zones in urban areas.

Policy 3: Provision of free primary healthcare for the underserved population with emphasis to the special health needs of women and children.

8.1.6 Tourism and Recreational Facilities

The Pourashava area has not enough facilities for tourist attraction. Recreation facility is important for healthy and environment friendly living in urban areas. Therefore, the pourashava should have fixed areas in proportionate to the population for playgrounds, parks as recreational places to serve the urban population.

Policy 1: Ensure planned and equitable distribution of play grounds, parks as recreational places in appropriate locations in the Pourashava.

Policy 2: Ensure open spaces in underdeveloped areas for future parks and playgrounds and take strict measures against all encroachment or negative activities.

Policy 3: Conserve natural water bodies, forests in and around urban areas as public recreation open spaces.

8.1.7 Safety and Security

Social unrest, violence, theft, robbery, murder, hijacking, kidnapping, eve teasing, illegal toll collection, drug addiction and drug trading violence against women and working children etc. have become prominent among the serious urban problems. On the other side, security from all evils and miscreants of all forms is a pre-requisite of economic development.

Life and property of the citizens must be protected from any unlawful and unwarranted incidence. To ensure safety and security of the people and their property adequate Law Enforcing arrangements should be available to every corner of the country.

Policy 1: The Pourashava authority will ensure the rule of law and ensure order in the everyday life of its citizens.

Policy 2: To bring about an improvement in overall urban social lives, identification of major areas that need improvement and a concerted effort will be made to address them at the same time for greater impact.

Policy 3: Eencouraging community participation in maintaining law and order in the Pourashava.

8.2 Physical Infrastructure Sectors

8.2.1 Transport

Transport interventions in urban areas should aim at improving transport and traffic infrastructure and its policy priorities. In urban areas roads are the main system of transportation and policies

must be made to make better use of existing road infrastructure and giving highest priority to pedestrians and to environmental protection. Mass rapid transit, rather than private cars, should receive greater preference.

- Policy 1: Land use planning should be directed towards developing transport corridors so that urban growth takes place along such corridors and not in a haphazard manner.
- Policy 2: Pedestrians should be given the highest priority in urban transportation policy and planning.
- Policy 3: National highways connecting urban centres should by pass through a separate corridor.

8.2.2 Utility Services

Provision of adequate utility services, such as water supply, sewerage and sanitation, drainage, electricity, energy, waste disposal, telecommunication in urban centres and their proper maintenance have major contributions in advancing the cause of sustainable and environmentally sound development. Therefore, proper consideration of urban services should be included in the urban planning process.

- Policy 1: Ensure planned and equitable distribution of utility services in appropriate locations in the Pourashava.
- Policy 2: Establishment of support mechanisms to enable people of all income groups in general and of those living in poverty and the disadvantaged to have access to basic services should be done.
- Policy 3: Properly set user fees and charges for utility services are the most effective means of managing demand.

8.2.3 Flood Control and Drainage

Flood control and drainage of the Pourashava is served by a canal system. The canal system is not functioning. Most of the canals have been dried up due to siltation and blockade due to encroachment. Proposal has been made in the plan to re-excavate the canals and create a canal network through connecting the missing links for improvement of the drainage system.

- Policy 1: Re-excavate the canals and create a canal network through connecting the missing links for improvement of the drainage system
- Policy 2: Canal and other major water bodies are conserve that can act as water retention area during rainy season. The canals have to be re-excavated, linked with each other through excavation of new canals in the areas of missing link. It is assumed that these canals will be able to contain the rainfall runoff. It will also defuse localized inundation by distributing water uniformly all over the network.
- Policy 3: Bridge and culverts should be constructed in appropriate location of the canals, so that flash flood water can be drained quickly.

8.3 Environmental Issues

All planning activities should be directed towards developing liveable urban environment with special focus on incorporating carbon free green city.

8.3.1 Natural Resources

The natural resources of the Pourashava are mainly based on agriculture and cottage industries. Main crop of this area is paddy. Cottage industries like Bamboo and Wooden Made Furniture and other goods etc. is another income source of the local people. Currently land throughout the country has come under speculative purchase for future gain. In order to prevent speculative purchase and sale of land and unnecessary conversion to non-agricultural use, the division of entire area into rural, urban and conservable areas will be an effective safeguard

Policy 1: High valued agricultural land should be protected in order to unnecessary conversion to non-agricultural use.

Policy 2: Minimum conversion of agricultural land should be ensured in the preparation of master plan. It is mentioned that the existing rural settlement areas, urban designated areas and the rural growth centers are large enough to accommodate all the expected development for a long period of time. Through intensive use of the existing non-agricultural settlement areas and rural growth centers additional requirement of land for development activities can be met.

.Policy 3: Promote agro-based and agro-supporting industries in the growth centers for attracting to produces more natural resources.

8.3.2 Sanitation

Chandanaish Pourashava has inadequate sanitation facilities. Modern sanitation facilities are totally absent. Urban dwellers have been used only sanitary latrines. With the increase of population and rapid urbanization it is natural that generation of solid waste will also increase. If these wastes are not properly managed, it can have detrimental effects on the environmental quality. So collection and management of solid waste is a great challenge for the Pourashava authority.

Policy 1: Sanitary latrine in every household will be promoted. Along with individual sanitation, public and community latrines will be set up by Pourashava and leased out to private sector for maintenance.

Policy 2: Measures will be taken to recycle, as much as possible, waste materials and to prevent contamination of ground water by sewerage and drainage.

Policy 2: Social mobilization through publicity campaign and motivational activities using mass media among other means to ensure behavioral development and change in sanitation and hygiene.

8.3.3 Hazards

In Bangladesh, natural disasters like floods and cyclones cause extensive damage to lives and properties in both urban and rural areas. In recent years, people have become more aware about the possibility of disaster due to earthquake because of the way developments are taking place in

urban areas. Serious consideration, therefore, should be given to including disaster management within urban and national development strategies.

Policy 1: Development of commercial and industrial activities should be restricted beside the hilly side. Frequent flood and water logging is the common disaster around this hilly areas of the Pourashava.

Policy 2: Construction of cyclone centers should be constructed in order to protect man and animals

Policy 3: Pourashava authority should be well equipped with disaster management and quick response to warning and risk management.

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

Environment has become a major concern as uncontrolled development has already started to produce its negative impact on nature. There is no large industry in the Pourashava area. Beyond the Pourashava, some mills are developed along the Chittagong-Cox's Bazar Highway. Discharge of untreated effluent from the industries will be a problem in future. Therefore, following strategies and policy should be adopted in order to attain sustainable development.

Policy 1: Water bodies should be free from of untreated effluent from the industries.

Policy 2: Installation of effluent treatment plant in noxious waste producing industries should be mandatory

Policy 3: Protect, preserve and enhance the urban environment, particularly water bodies.

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

The present plan package imposes a large number of development projects on Chandanaish 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 Chandanaish 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 can not 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 (Proposed by UGIIP, LGED)

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

1. Engineering Div: a) Development, maintenance & quality control Section
 b) Water supply, sewerage, drainage and waste disposal Section
2. Planning Div: a) IT Section
 b) Planning Section
 c) Beautification and recreation Section
3. Administrative Div: a) Administrative Section
 b) Revenue Section
4. Accounts Div: a) Budget, accounts and Audit Section
5. Public Health Div: a) Food and Beverage Control Section
 b) Health and Public Welfare Section
 c) Pura Hospital and Clinic Section (optional)

According to the divisions and their relevant sections the manpower should be set up for each category of Paurashava.

The above committee has also chalked out the detail scope of work for each division. The scope of proposed Planning Division is given in *Figure 9.1*.

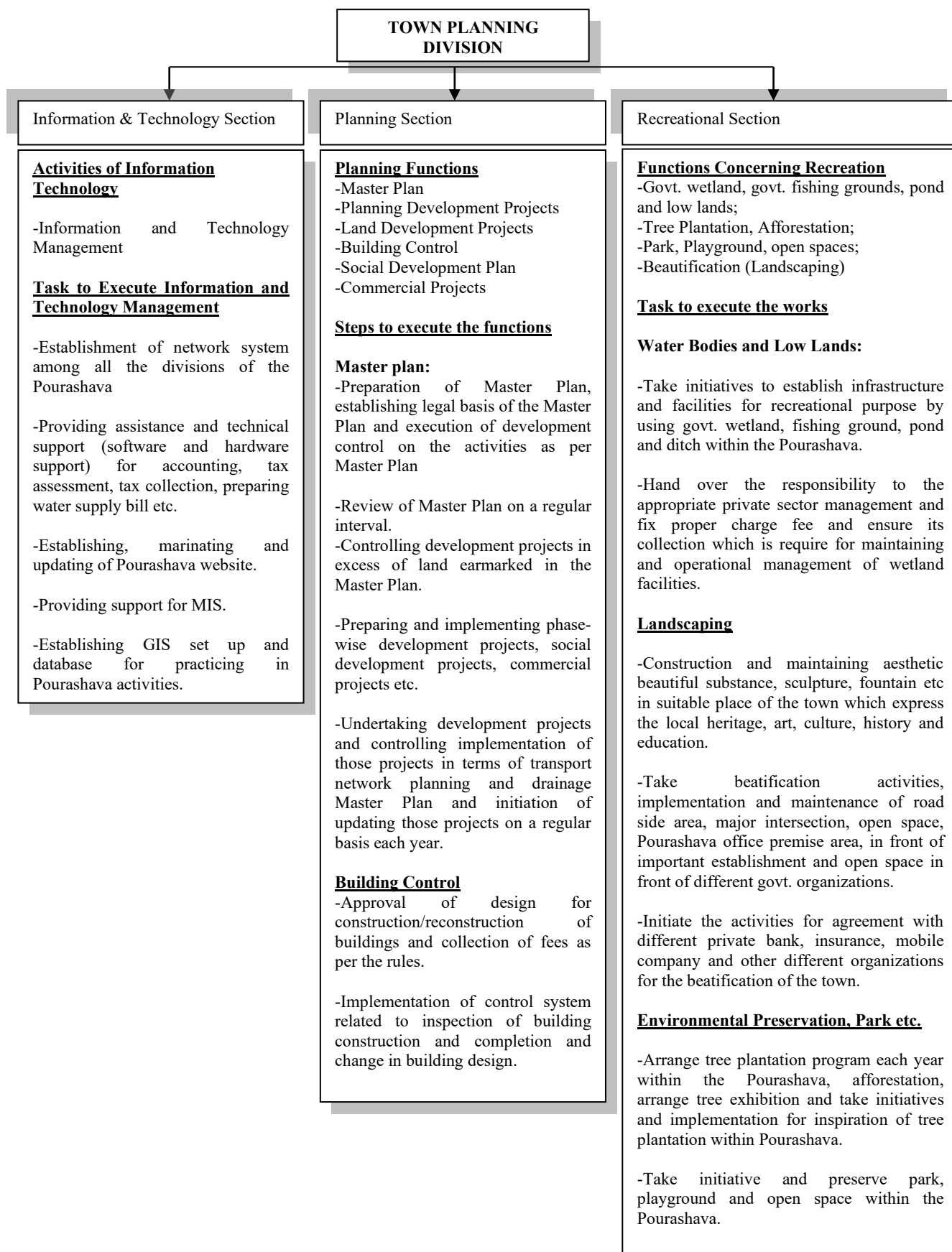


Figure 9.1: Scope of Work for Planning Division

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.

Chandanaish 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 prerequisite for successful implementation of the Structure Plan.

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 Chandanaish 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 Chandanaish 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, Chandanaish Paurashava will have to depend substantially on the government funding for implementing the development projects. But the government has limitations of its resources. In such a situation, if the Paurashava can not raise its own revenue adequately, it will not be able to execute much of the development projects under the Master Plan.

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

9.3 Concluding Remarks

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

activities over a long period of time in and around the cities.



PART-B
URBAN AREA PLAN

Part B: Urban Area Plan

1. Introduction

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

2. Goals and Objectives of Urban Area Plan

The Urban Area Plan has been prepared within the policy framework of the Structure Plan and aims to attain the overall project objectives. In fact, Urban Area Plan is the first phase detailed illustration of the policies and strategies of the structure plan. The Urban Area Plan is, therefore, more rigid than Structure Plan. Making a land use plan based on mouza maps makes the Urban Area Plan more rigid. The current Urban Area Plan is similar to the traditional Master Plan approach established 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. Once the plan is prepared and accepted by the government and formalized, it gains a formal status and thus becomes a binding for all concerned. The Urban Area Plan is aimed to:

- Plan for the people of the town to develop and update provisions for better housing, infrastructures for roads, markets, transport network, bus terminals, sanitation, water supply, drainage, solid waste management, electricity, education, leisure and such other infrastructure facilities for meeting the social and community needs of the poor and the disadvantaged groups for better quality of life; and
- Prepare a multi-sector short and long term investment plan through participatory process for better living standards by identifying area based priority-Drainage master plan, transportation and traffic management plan, other need specific plan as per requirement in accordance with the principle of sustainability.

3. Methodology and Approach to Planning

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

4. Delineation of Planning Areas

Delineation of the urban area plan is based on the urban growth area as identified in the structure plan. It contains more details about specific programme and policies that require to be implemented. In order to delineate this UAP boundary, a wide reconnaissance survey of the entire Pourashava area was conducted including those areas which have future potential growth. Rationale behind the delineation of the planning area of Chandanaish Pourashava for the year 2031 has been done on the basis of the gazette notification of the Pourashava, the conducted reconnaissance survey within the poura area, the discussions with all groups of stakeholders and analyzing the present trend of developmental growth of the town. To be acquainted with local conditions and the future trend of development, valuable advices were received from the Poura Mayor, Councilors and other staffs of the pourashava. From the discussions with various levels it is found that since the birth of Chandanaish Pourashava formed eleven years back (2002); the development trend does not take much momentum as it required. Thus the consultant is advised not to extend the existing boundary as the present area is enough as planning area.

5. Content and Form of Urban Area Plan

The Urban Area Plan is presented in both map and textual format. The plan map is presented on enlarged RS mouza maps in 1:1980 (1"=165') scales. The plan is accompanied by an explanatory report supported by necessary figures, maps and data. The report explains the various plan proposals and other components of the plan. At present, the Urban Area Plan of Chandanaish Pourashava covers the total area of 18.92 sq. km. with a present population of 75,359. The Urban Area Plan of the Master Plan of Chandanaish Pourashava contains several components. These are:

1. Land Use Plan;
2. Transportation and Traffic Management Plan;
3. Drainage and Environmental Management Plan and
4. Plan for Urban Services.

Chapter 10: Land Use Plan

10.1 Introduction

Land use plan is a part of the urban area plan package. In this plan broad land use and proposed major transport links have been shown to enable the Chandanaish Pourashava to manage land development according to the plan provisions and secure right of ways for future transportation network. Land Use Plan is aimed to guide the physical development of Chandanaish town including its economic and social activities. This plan adheres to the policy directives spelled out in the Structure Plan.

10.1.1 Methodology and Approach to Land Use Planning

Land use planning is basically concerned with the location, intensity and amount of land development required for various space-using functions for the community of urban life. Land use plan is prepared for managing and promoting development over medium term on the basis of the strategies set by longer-term structure plan. Existing urban areas and their immediate surroundings is considered the coverage of the urban area. Land use plan is prepared with suitable intervention supported by the appropriate urban development activities that expecting to take place over the next 20 years. This is done on the basis of projected population and future demand and existing uses.

10.2. Existing and Projected Land Use

10.2.1 Introduction

Chandanaish Pourashava is surrounded on the north by Patiya and Rangunia upazilas, on the east by Bandarban sadar upazila of Bandarban district, on the south by Satkania upazila and on the west by Anowara upazila. The Pourashava is still predominately rural in character. It has not attained its true urban character and it is fast transforming into an urban area. However, it is anticipated that over time, with substantial development the entire pourashava will attain fully urban character.

In Chandanaish Pourashava area, existing land uses is showing that agriculture land is the highest as 63.95 percent and transport and communication is the lowest as less than 0.01 percent in this pourashava. Though, agriculture landuse dominates the overall landuse of the pourashava, after the preparation of Master Plan, a radical change in physical development will proceed. Thus, considering this issue, the Master Plan will be designed in such a way so that major portion of the agriculture landuse can be saved.

Determining factors of landuse change is the income of the people, government policy, new establishment like industry, higher level educational institute, construction of road and embankment and availability of services and utilities. Projected land uses by the year 2031 are determined on the basis of increased population estimated by past trend population projection. Recommended planning standard is the guideline for proposing land uses in the Chandanaish Pourashava.

Table 10.1 Recommended Planning Standards

Types of Land Uses	Recommended Standard Provision (Unit)
Residential General residential Real Estate – Public/Private	100 -150 persons/1 acre 200 population/ 1 acre
Roads Pourashava primary roads Pourashava secondary roads Pourashava local roads	150 - 100 feet 100 - 60 feet 40 - 20 feet
Education Nursery Primary School/ kindergarten Secondary/High School College Vocational Training Centre Other	0.5 acre/10,000 population 2.00 acres/5000 population 5.00 acres /20,000 population 10.00 acres/20,000 population 5 - 10 acres / Upazila 5.00 acres / 20,000 population
Open Space Play field/ground Park Neighborhood park Stadium/sports complex Cinema/ Theatre	3.00 acres/20,000 population 1.00 acre /1000 population 1.00 acre /1000 population 5 - 10 acres/Upazila HQ 1.0 acre /20,000 population
Health Upazila health complex/ hospital Health Centre/Maternity clinic	10 -20 acres/Upazila HQ 1.00 acre/ 5,000 population
Community Facilities Mosque/Church/Temple Eidgah Graveyard Community Centre Police Station Police Box/ Outpost Fire Station Post office	0.5 acre /20,000 population 1.0 acre/20,000 population 1.00 acre /20,000 population 1.00 acre /20,000 population 3 -5 acres/Upazila HQ 0.5 acre/ per box 1.00 acre/ 20,000 population 0.5 acre /20,000 population
Commerce and Shopping Wholesale market Retail sale market Corner shops Neighborhood market Super Market	1.0 acres/ 10000 population 1.0 acres/ 1000 population 0.25 acre/per corner shop 1.00 acre/per neighborhood market 1.50- 2.50 acres/per super market
Utilities Drainage Water supply Gas Solid waste disposal site Waste transfer station Electric sub-station Telephone exchange Fuel Station	As per local requirement 1.00 acre /20,000 population 1.00 acre /20,000 population 4 - 10 acres/Upazila HQ 0.25 acres/per waste transfer station 1.00 acre/20,000 population 0.5 acre/20,000 population 0.5 acre/20,000 population
Industry Small scale Cottage/agro-based	1.50 acres /1000 population 1.00 acres /1000 population
Transportation Bus terminal Truck terminal Launch/steamer terminal Railway station Baby taxi/tempo stand Rickshaw/van stand Passenger Shed	1.0 acre /20,000 population 0.50 acre /20,000 population 1.00 acre /20,000 population 4.00 acre / per Station 0.25 acre /one baby taxi/tempo stand 0.25 acre /one baby taxi/tempo stand 0.25 acre /one baby taxi/tempo stand
Administration Upazila complex Pourashava office Jail/Sub-Jail	15.00 acres 3 - 5 acres 10 acres/Upazila HQ
Agri-extension Farm	10 acres/Upazila HQ
Urban Deferred	10 percent of the total build up area

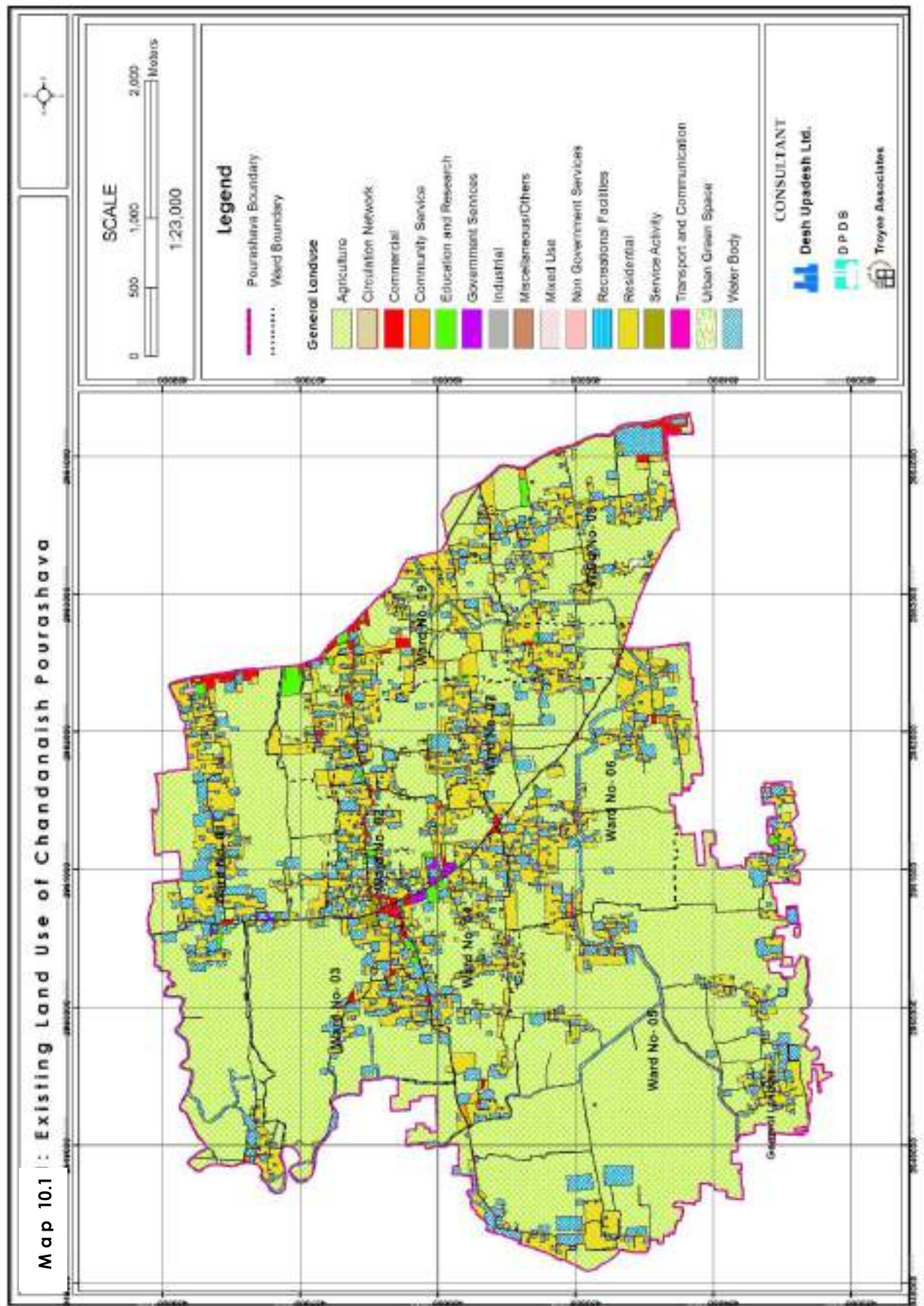
10.2.2 Analysis and Projection on Existing Land use

Chandanaish Pourashava comprises of 4676.46 acres. Existing land uses in the study area is showing that agriculture land is the highest as 63.95 percent and transport and communication is the lowest as less than 0.01 percent in this Pourashava. About 2990.7 acres i.e. 63.95 percent of the project area is under agricultural use. Commercial land use occupies only 41.03 acres of land that constitutes only 0.88 percent of the total land. There are few processing and manufacturing industries which occupy 0.36 acres of land that constitute only 0.01 percent of total land use. It is also observed that about 31.21 acres is used as educational facility and 0.72 acres is used as recreational area, which constitutes respectively only 0.67 percent and 0.02 percent of the project area. Residential land use within the study area is 877.97 acres, which constitute 18.77 percent of the Pourashava area. The broad land use description is summarized in the *Table 1.2*.

Table 10.2: Summary showing Distribution of Land for Existing Landuse

Sl. No	Landuse	Area (in Acre)	Percent of total area (%)
1	Residential	877.97	18.77
2	Commercial Use	41.03	0.88
3	Industrial Use	0.36	0.01
4	Educational Facility	31.21	0.67
5	Community Services	23.34	0.50
6	Service Activity	5.44	0.12
7	Recreational Facility	0.72	0.02
8	Governmental Services	6.98	0.15
9	Non-Government Services	1.05	0.02
10	Urban Green Space	33.57	0.72
11	Transport and Communication	0.21	0.00
12	Agricultural Use	2990.7	63.95
13	Mixed Use	0.25	0.01
14	Circulation Network	77.94	1.67
15	Water body	585.3	12.52
16	Miscellaneous	0.39	0.01
17	Restricted Area	-	-
18	Vacant Land	-	-
19	Forest/ Hilly Area	-	-
Total Area		4676.46	100

Source: Landuse Survey, 2009



10.2.3 Analysis and Projection on Proposed Landuse

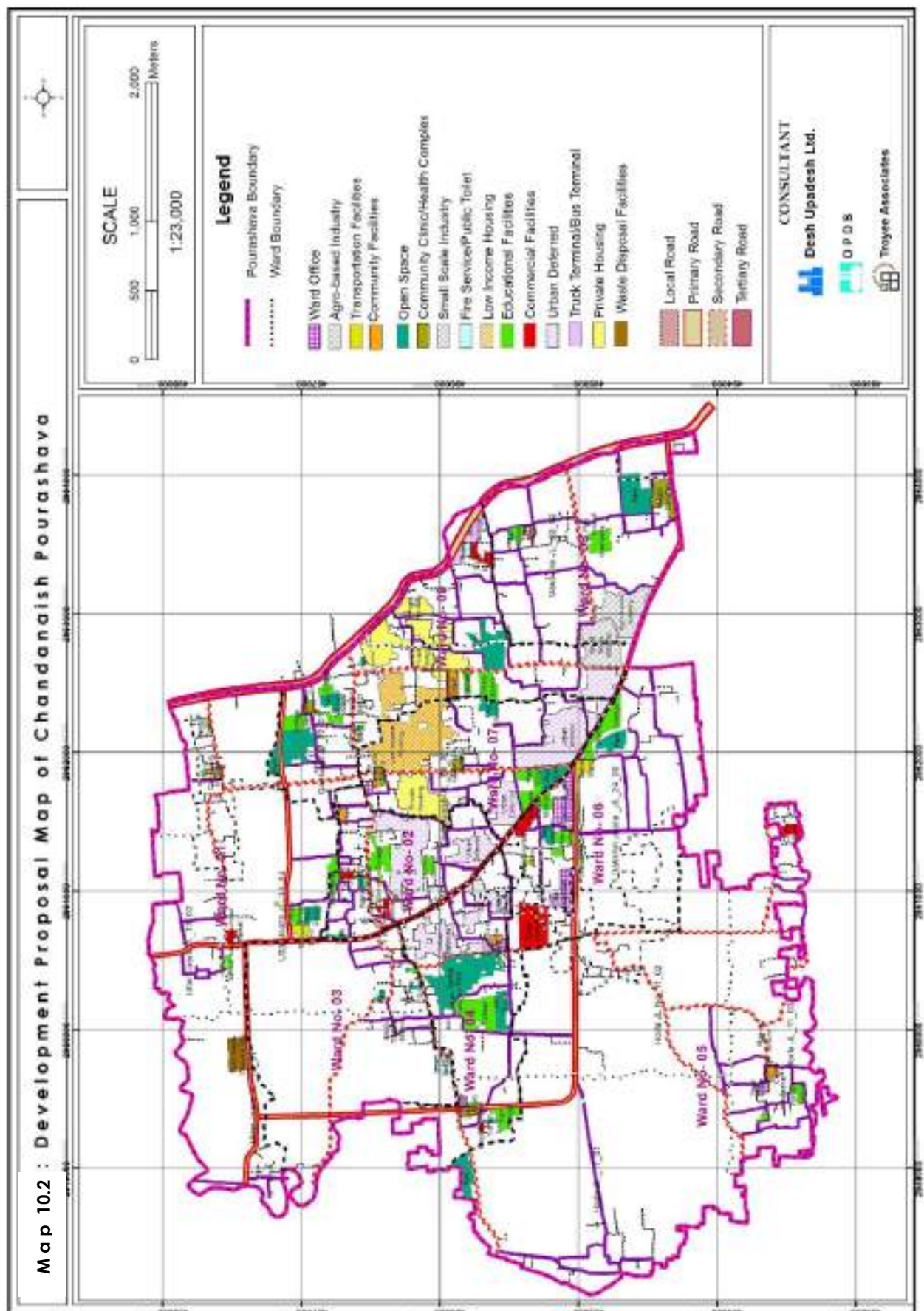
Chandanaish Pourashava is one of the Pourashava in the Cox's Bazar district. Rapid urbanization rate demanded more land for future development. Although, proposed land uses are adjusted to 4676.46 acres as per the existing land use. Out of this residential land use recorded to 307.08 acres. Future landuse has been calculated according to the development control for the masses and the standard supplied by the LGED. In case of public land, existing use and khas land have been emphasized. Willingness and participation of the people in development activities considers as a key factor for future landuse demarcation. People are not aware about the modern facilities available to their door step. It is easier to inject guiding principles, modern facilities and long run development control for the Pourashava as well as for the inhabitants. *Table 1.3* shows the distribution of proposed land use and *Map 1.2* shows specific development proposal under Land Use Plan.

Table 10.3: Summary showing Distribution of Land for Proposed Landuse

Sl. No.	Proposed General Land Use	Area in Acres	%
01	Urban Residential Area	307.08	6.57
02	Rural Settlement	835.82	17.87
03	Education and Research	117.54	2.51
04	Governmental Office	34.05	0.73
05	Health Services	16.86	0.36
06	Commercial Zone	60.9	1.30
07	General Industry	41.76	0.89
08	Heavy Industry	0.3	0.01
09	Mixed Use	0.15	0.003
10	Circulation Network	290.93	6.22
11	Transport and Communication	16.12	0.34
12	Utility Services	12.63	0.27
13	Community Facilities	34.66	0.74
14	Recreational Facilities	2.41	0.05
15	Restricted Area	0	0.00
16	Agriculture	2120.39	45.34
17	Urban Green/ Open Space	171.21	3.66
18	Water Bodies	381.78	8.16
19	Forest	0	0.00
20	Miscellaneous	2.03	0.04
21	Urban Deferred	229.84	4.91
Total		4676.46	100

Source: Proposed by the Consultants

Annex-7 shows the summary of different development proposal (mouza schedule) according to ward no., mouza and plot no.



Residential

According to the population projection for the year 2031, total population of the Chandanaish Pourashava will be 101,498. In the recommended planning standard provided by PMO, UTIDP, gross population for an ideal pourashava considers 100 persons per acre, total residential land will not be needed. Existing residential area of the Pourashava is 877.97 acres and population net density per acre is 86, so land additional area for residential development will be required for the year 2031.

Commercial

Existing commercial area of the Chandanaish Pourashava is 41.03 acres. In the recommended planning standard provided by PMO, UTIDP, total 114.9 acres commercial land will be needed to serve the population for the year 2031. Different commercial activities that have to be provided in future may be market / bazar, different services relevant with daily needs and shops (include General store, Grocery, Stationary, Confectionary, Medicine Shop, Sweet Meat Shop, Fruit Shop, Fresh Corner (Vegetable, fish, meat, egg, chicken, etc.).

Industrial

Processing and manufacturing industries of Chandanaish Pourashava that occupy only 0.36 acres land and these all are light industries. For the year 2031, more 253.75 acres land should be provisioned according to the standard for industrial development.

Educational Facility

Mostly educational institutes such as primary school/kindergarten, secondary school, college and vocational training institute are in this group. Existing land under this use is 31.21 acres. For the year 2031, more 120.96 acres land will be needed if standard considers for this purpose.

Community Facility

At present, no community center is in the Pourashava; about 5.07 acres land may be provisioned for community center. Standard for post office will be 0.5 acre per 20000 populations. In the Pourashava, post office is performing activities but, the land occupied by them is lower than the standard prescribed. The police station in the Pourashava is covering 0.318 acres of land. According to the standard, one police station may be covered 3 to 5 acres land for an Upazila.

Recreational Facility

Recreational facility is covered only 0.72 acres land. Standard for recreational facility includes cinema/theatre and covered stadium/sports complex. Up to the year 2031, 5.07 acres land (1 acre per 20000 populations) will be needed for cinema / theatre and 5 to 10 acres for stadium.

Government Services

Existing land under this use is 7.01 acres. For the year 2031, more 20.99 acres land will be needed. The administration includes Pourashava office, Police station and other utility offices. Standard for Pourashava Office is prescribed 3 to 5 acres. Existing areas are far below than the standard prescribed. Expansion of existing administrative facilities up to the year 2031 will be appropriate.

Urban Green Space

Open space includes play field/play ground, park, neighborhood park, community/reserve forest, tennis ground and open tourism components. According to the prescribed standard, 101.5 acres for park (1 acre per 1000 population) and 15.22 acres for play field will be required. At present,

33.57 acres of land is under the open spaces. Up to the year 2031, 218.22 acres land under open spaces will be needed.

Transportation and Communication

In the Pourashava, 0.21 acres land is under this use. For the year 2031, 18.11 acres land will be needed according to the standard prescribed in the *Table 1.1*. Transportation and Communication related services are Bus transport terminal, Railway station, Truck terminal, Rickshaw/ Van/ Auto stand, Launch/ Boat ghat/ Jetty Passenger shed, etc.

Agriculture

Existing total area under agricultural use is 2990.7 acres. After implementation of the Urban Area Plan up to the year 2031, it will be reduced.

Mixed use

Existing land under this use is 0.25 acres. Up to the year 2031, such use of land will be reduced. Mostly central area of the Pourashava is under mixed use zone. The residences with mixed use activities are discouraging here. Those residences should be shifted gradually to the residential area.

Road Network

In the Pourashava, 77.94 acres land is under regional and local roads. More 231.59 acres land will be needed for provisioning proposed roads up to the year 2031. About 6% of the total land may be considered for road network.

Water body

No standard is being prescribed for water body. In the Pourashava, total water body is 585.5 acres and up to the year 2031 it will be 381.78 acres.

10.2.4 An Estimate on the Requirement of Land for Different Landuses

1) Residential Zone

Existing residential areas of the Pourashava is 881.14 acres. But in proposed land use, residential land occupies 1151.85 acres. About 71.59% residential land belongs with the rural homestead. Therefore, rural environment will be considered for creating better living areas. This zone will allow commercial uses as listed in *Table-A.1, ANNEX-6*, and conditional uses as listed in *Table-A.2, ANNEX-6*. *Table 1.4* shows the plot wise important housing related proposal for Chandanaish Pourashava

Table 10.4: New Development proposal for Residential Zone

Type of Facilities	Ward No.	Mouza Name	Plot No.	Area (acre)
Low Income Housing	07	Chandanish JL _23_00	9249, 8962, 8968, 9229, 9250, 9228, 8970, 8983, 8969, 8971, 9227, 8972, 9226, 9225, 8982, 8981, 8974, 8973, 9224, 8980, 8979, 8993, 8989, 8988, 8975, 8990, 8976, 8978, 9218, 8992, 8991, 9222, 9217, 8977, 9215, 9016, 9017, 9018, 9214, 460, 461, 457, 463, 462, 466, 467, 464	47.81
	09	Gacbaria JL _22_01	454,455,461-468, 484, 486, 886, 892, 918, 921, 942, 948, 99999, 1199, 1481, 1729, 1733, 1734, 1739, 2049, 99999, 2551, 2656, 2658, 2667, 2668, 2681, 2721,2722, 99999, 3393, 3448, 3624, 3625, 3631, 3703, 3777, 99999, 4541, 4549, 4550	16.86
Private Housing	02, 07	Chandanish JL _23_00	1-9, 12-16, 18-24, 29-30, 33-35, 38-39, 43, 60-62, 73-74, 81-85, 88-98, 768-771, 781, 786-789, 793-795, 797-798, 800-801, 810-811, 813, 816-817, 820-821, 823, 825, 828, 831-832, 836, 837, 840-842, 844-848, 858, 859, 868-871, 876-877, 881, 1519-1520, 1871-1872, 1878, 1880, 1885, 1900, 1903, 1905, 1910-1911, 1917, 1926, 3094, 3096-3098	21.93
	09	Gacbaria JL _22_02	2118, 2119, 2124-2130, 2133-2137, 2139-2141, 2143, 2145, 2510-2512, 2517- 2524, 2526- 2540, 2542-2547, 2559-2560, 2569-2582, 2585-2601, 2697-2725, 2727-2729, 2732-2736, 2741-2753, 2755, 2757, 2766-2769, 2770, 2801- 2807, 5001-5003, 5006, 5007, 5010-5016, 5018-5046, 5051-5058, 5071-5072, 5074-5080, 5082-5097, 5101, 5107-5118, 5120, 5123-5126, 5131, 5139, 5144-5151, 5154, 5161-5162, 5164-5167, 5169-5182, 5187-5190, 5192-5201, 5203, 5205-5206, 5208-5220, 5224-5269, 5298, 5420, 5817, 5819-5835, 5838-5845, 5847-5848, 5850, 5851	45.6

Determination of Standard

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

Recommendation/ Proposition

According to the standard (100 persons per acre), 1014.98 acres land will be needed up to the year 2031. Existing residential area (877.97 acres) is lower than the projected areas. Allocation of residential land for future is not prescribed by the Consultant. The Consultant recommends one row housing area for disaster victims. Mostly khas land will be preferred for such development and it should not be above 20 acres. Rural environment should be confirmed in the row housing areas.

Conservation and harvesting of rain water in Government Blocks, Commercial Buildings and Institutional Buildings has been promoted and encouraged. They should provide required facilities and infrastructure for conservation and harvesting of rain water available to them.

The paved surface around the building shall have percolation pits of 4'x4' covering at least 30% of such areas. Such pits shall be filled with small pebbles or such absorbing materials or river sand and covered with perforated concrete slabs.

2) 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. 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, Private Housing such as Middle Income Housing can be promoted maintaining the density criteria. This zone has an area of 835.82 acres (17.87% of the existing Pourashava area) designated up to 2031. This zone will allow rural residential uses as listed in *Table-A.7, ANNEX-6*, and conditional uses as listed in *Table-A.8, ANNEX-6*.

3) Educational & Research zone

Educational & Research zone refers to mainly education & research and other social service facilities as listed in *Table-A.13, ANNEX-6*, and conditional uses as listed in *Table-A.14, ANNEX-6*. The total area under this use has been determined as 117.54 acres (2.51% of the existing Pourashava area) that include existing, newly proposed (86.33 acres) land uses and expanding land for existing educational institutions. 5 new primary schools (ward no. 1, 5, 6 and 7&9), 5 new High Schools (ward no. 1, 3, 4, 7 and 8), 4 new colleges (ward no. 2, 4, 6&7 and 9) and 2 Nursery schools (ward no. 2, 9) are proposed and other existing institutes are recommended to strengthen their status through vertical expansion and conversion of non-government institutions to MPO. *Table 1.5* shows the plot wise important educational facilities proposal for Chandanaish Pourashava.

Nursery/ Kindergarten and Primary School

Determination of Standard: According to the standard, for nursery/ kindergarten, 1 unit with 0.5 acres of land is to be provided for every 10,000 population and for primary school, 1 unit with 2 acres of land is to be provided for every 5,000 population. The study team has estimated 101,498 populations for the planning area up to the year 2031. Considering this population, 5.07 and 40.06 acres of land will be required respectively for nursery/ kindergarten and primary school up to the year 2031. The planning area already has 1 nursery/ kindergarten and 16 primary schools with an area less than the projected area is required.

Recommendation/ Proposition

Considering different planning aspects, 3.06 and 16.83 acres of land have been proposed for nursery/ kindergarten and primary school respectively. Besides, with new enrollment, existing primary schools may be expanded horizontally or vertically mainly.

Secondary/ High School

There are 10 secondary schools in the planning area covering together 5.84 acres of land. Average area of a secondary school is only 0.584 acres.

Determination of Standard

According to standard, 5 acres of land may be provided for every 20,000 population for one secondary school. The projected population of the planning area is 101,498 up to the year 2031.

Therefore, as per standard the planning area needs (101,498 / 20,000), means 25.37 acres land will be needed for secondary school up to the year 2031.

Forecast / Recommendation:

According to the standard and considering different planning aspects, 5 new secondary/ high schools with an area of 16.54 acres are necessary for the planning area. Besides, with increasing of enrollment, existing high schools may be expanded horizontally or vertically.

College

There are 3 colleges in the planning area. The existing college is located on 4.08 acres of land.

Determination of Standard

The standard for college is 10 acres per 20000 populations.

Recommendation/ Proposition

For the planning area 5 new colleges with 36.37 acres of land are prescribed considering the growing population and planning standard. Vertical expansion of the existing college is required.

Table 10.5: New Development proposal for Education and Research Zone

Type of Facilities	Ward No.	Mouza Name	Plot No.	Area (acre)
New College	02	Chandanish JL_23_00	1-11, 18, 20-24, 26-30, 32-34, 38, 40, 42, 44, 46-47, 50-52, 54-57, 59, 64, 67, 86, 88, 90, 93-94, 1056, 1082-1084, 1095, 1100, 1106, 1109, 1115-1117, 1131, 1135, 1143, 1220, 1223	7.25
	04	Horla JL No_11_02	3, 5, 7, 9, 10-15, 17, 20-22, 24, 27-29, 31-32, 34-41, 43-44, 46- 47, 54-58, 60-62, 64, 66, 68-69, 73-83, 86-87, 90-94, 99, 5200-5201, 5224-5226, 5229-5230, 5233, 5242, 5245, 5250-5253, 5259, 5263, 5267, 5270-5272, 5284, 5288-5291, 5295-5298, 5300-5302, 5304-5308, 5318- 5319, 5323, 5327-5328, 5354, 5776, 5780, 5782, 5783, 5793, 5795, 5810, 5811, 5814, 5817-5818	14.06
	06, 07	Dakkhin Joara JL_24_00, Chandanish JL_23_00	75, 2022, 2025-2036, 2039-2069, 2587, 2591-2609, 2611-2626, 2636, 2639-2640, 2644-2649	8.78
	09	Gacbaria JL_22_01	1095, 1097-1099, 1101- 1112, 1122-1130, 1132, 1134-1142, 1145-1147, 1149-1153, 1157-1159, 1166, 1175, 1178-1186, 1575, 1734-1736, 1739-1745, 1747, 1750, 1752, 1753,	4.28
		Gacbaria JL_22_01	1899-1900, 1902, 1905-1906, 1910, 1914-1918, 1990-1996, 1999-2006, 2008-2009, 2047-2049	2
High School	01	Uttar Joara JL_13_02 & 04	8053, 8054, 8062- 8064, 251, 253, 8947	1.65
	03	Uttar Joara JL_13_04	8584, 8647, 8655, 8648, 8653, 8654, 8656, 8666	0.36
	04	Horla JL _11_01	1, 34, 36-38, 47, 56-57, 71-75, 78-79, 92-93, 780-782, 790-791, 794, 804-806, 958-970, 976-977, 980, 1032, 1033, 1035, 1039, 1046, 1444	5
	07	Chandanish JL _23_00	1-10, 13, 65-68, 70-71, 79-80, 82, 99, 2464, 2466, 2467, 2472-2473, 2475-2477, 2481, 2484, 2486, 2496, 2500, 2503-2504, 2508, 2511-2512, 2514-2515, 2517	7.46
	08	Gacbaria JL _22_02	6197-6203, 6266, 6272, 6274-6283, 6288-6289, 6395-6398, 6487	2.17
Primary	01	Uttar Joara JL_13_04	9016-9022, 9208- 9214	2.65

Type of Facilities	Ward No.	Mouza Name	Plot No.	Area (acre)
School	05	Horla JL_11_03	25, 66, 72-77, 12119, 12120, 12123, 12171	0.83
	05	Horla JL_11_03	6, 7, 8, 11, 39, 304, 305, 12238, 12241, 12243, 12244, 12302, 12303, 12309, 12310, 12312, 12324, 12327	2.5
	06	Dakkhin Joara JL_24_00	321-322, 324, 333-342, 363, 376-390, 406, 407	2.77
	07, 09	Chandanish JL_23_00 & Gacbaria JL_22_01	91, 92, 94, 1757, 1765, 1768-1782, 1784-1788, 1790, 1826, 1833-1836, 1838-1839, 1842, 2494, 2815- 2816, 2819- 2826, 2838-2855, 2875, 2877, 2878-2898, 2927	8.08
Nursery School	02	Chandanish JL_23_00	2, 31, 279	0.1
		Chandanish JL_23_00	7, 9, 52- 54, 73-75, 78, 81, 83, 1376, 1380, 1382, 1384-1390, 1392-1393, 3093	2.67
	09	Gacbaria JL_22_01	2275-2280, 2323, 2325	0.29
Madrasa	01	Uttar Joara JL_13_04	9372, 9373	0.17
	01, 02	Uttar Joara JL_13_04 Chandanish JL_23_00	1, 93, 96-97, 184, 189, 192, 195, 198-200, 202, 1284, 9258, 9259, 9271, 9274-9276, 9601, 9603, 9605-9619, 9622-9630	4.58
	05	Horla JL_11_03	12328, 12330, 26	0.24
	06	Dakkhin Joara JL_24_00	459, 508, 90, 92, 93	0.06
		Dakkhin Joara JL_24_00	369-374, 421-429, 459,	1.01
		Dakkhin Joara JL_24_00, Horla JL No_11_02	2882, 400-402, 5, 612-618, 64, 66-67, 7262, 7263	0.73
		Dakkhin Joara JL_24_00	2058, 2059, 213-215, 217-225, 227-241, 2873, 2874	2.7
	08	Gacbaria JL_22_02	7545, 7546, 7549-7578, 7590, 7592, 7595-7598, 7603, 7966-7983, 7996-8007, 8018-8026	6.04
	09	Gacbaria JL_22_01	2694, 2695, 2805, 2806, 2829-2834, 2856-2858, 2861-2863, 2865-2867, 2872-2873, 3021, 3093	1.7
	01	Gacbaria JL_22_01	306-315	0.35
Library	04	Horla JL_11_01	5, 6, 9, 34, 641, 643, 727, 730-733, 737-738, 760	0.59
	07	Chandanish JL_23_00	1-5, 8-10, 907, 926	0.41

4) Government Office Zone

Government Office zone covers all kinds of government offices including existing and proposed (e.g. proposed ward office) in the town. The existing government offices are Upazila Tahsil Office, Upazila Agriculture Office, Police Station, Post Office, Pourashava Office, Sub-registry Office, T & T Office, and Upazila Parisad Office. The proposed Government Offices are one Agriculture Extension Farm, one Jail/Sub-Jail, Ward centers for nine wards and six police box/outposts. The permitted use in this zone is presented in *Table-A.15, ANNEX-6* and conditional uses as listed in *Table-A.16, ANNEX-6*. Total area under this use has been proposed 34.05 acres (0.73% of the existing Pourashava area) that include existing and proposed land uses. *Table 1.6* shows the plot wise important Government Office proposal for Chandanaish Pourashava.

Determination of Standard

According to the standard, 15 acres of land is to be provided for every Upazila, 3 to 5 acres per Pourashava office, 0.10 acres per Union and 10 acres for jail/sub-jail. Total required land for Government Office stands at 28.00 acres.

Recommendation/ Forecast

The planning area already has one Upazila Complex, one Pourashava Office and other govt. offices.. Therefore, no recommendation for new government office area is prescribed except 9.39 acres of jail/ sub-jail, 6.61 acres for ward offices and 8.07 acre for Agriculture Extension Farm but vertical expansion of the existing Government Offices is required.

Table 10.6: New Development proposal for Government Office Zone

Type of Facilities	Ward No.	Mouza Name	Plot No.	Area (acre)
Agri Extension Farm	06	Dakkhin Joara JL_24_00, Horla JL No_11_02	5, 6, 9, 53, 57-58, 468-469, 476-477, 479, 481-486, 488-493, 499, 500, 505, 514-520, 522-524, 564-565, 567-570, 573-575, 577-607, 7239, 7240, 7248, 7249, 7254, 7260, 7270	8.07
Jail/Sub-Jail	06	Dakkhin Joara JL_24_00	233-236, 239, 249-254, 260-268, 271-281, 285-287, 295-301, 308, 310-319, 342, 343, 351-357	9.39
Ward Office	01	Gacbaria JL_22_01	320-329, 508	0.49
	04	Horla JL No_11_01	46-49, 83, 635, 641, 643-645, 650-654,	1.11
		Horla JL No_11_02	4, 43, 52, 55-58, 60, 71-75, 80, 6230, 6231, 6553, 6577-6579, 6581, 6582	1.56
	05	Horla JL_11_03	51, 84, 85, 87, 89, 93-95, 409, 482, 12342, 12408, 12410, 12483, 12486, 12488, 12491, 12650	1.72
	07	Chandanish JL_23_00	2, 555, 556, 930, 933-935, 937	1.12
	08	Gacbaria JL_22_02	6283, 6284, 6288-6290, 6393-6396	0.61

5) Health Services Zone

The zone of health care facilities is intended to provide locations, where health facilities including upazila health complex and other maternity clinic can be set up and function without creating hazards to surrounding land uses. This zone has proposed with an area of 16.86 acres designated up to 2031. Maternity and Child health facility will be available at each ward center or office along with other facilities hence, ward office will be developed vertically. This zone will allow some uses as listed in *Table-A.9, ANNEX-6*, and conditional uses as listed in *Table-A.10, ANNEX-6*. *Table 1.7* shows plot wise important Health Services proposal for Chandanaish Pourashava.

Determination of Standard

The prescribed standard for health facilities are 10 to 20.0 acres for Upazila Hospital and 1 acre per 5000 population for Health centre/ Maternity clinic. According to the standard, up to the year 2031, 20.30 acres of land will be needed for Health centre/ Maternity clinic.

Recommendation/ Proposition

The study team recommends expansion of present Upazila Hospital on earmarking land, 7.18 acres for Community Clinics where the land owners will develop such services. Necessary planning permission will be offered by the Pourashava. The lands, however, should not be allowed to use other than health services.

Table 10.7: New Development proposal for Health Services Zone

Type of Facilities	Ward No.	Mouza Name	Plot No.	Area (acre)
Community Clinic	01	Gacbaria JL_22_01	319-322, 324	0.83
	04	Horla JL_11_01	4, 36, 38, 39, 56-59, 635, 637, 732, 733, 739, 740-751, 761	1.54
	07	Chandanish JL_23_00	19, 556, 916, 917, 920-924, 926	1.26
		Chandanish JL_23_00	1, 2, 4, 5, 72, 79-80, 86, 2073, 2081-2083, 2100, 2101	1.7
	09	Gacbaria JL_22_01	1746, 1846, 1851-1855, 1857-1870, 1879, 1890, 1924	1.85
Hospital	08	Gacbaria JL_22_02	6, 7805, 7806, 7808-7846, 7862, 8472-8479, 8481-8487	6.84

6) Commercial Facilities Zone

The land used for commercial activities is considered as commercial land use. These activities include the buying and selling of goods and services in retail businesses, wholesale buying and selling, financial establishments, and wide variety of services that are broadly classified as "Business". Commercial land includes established markets and areas earmarked for markets. The commercial zone is intended to provide locations which can be function without creating hazards to surrounding land uses. This zone has an area of 60.9 acres (1.3% of the existing Pourashava area) designated up to 2031. This zone will allow commercial uses as listed in *Table-A.5, ANNEX-6*, and conditional uses as listed in *Table-A.6, ANNEX-6*. *Table 1.8* shows the plot wise important commercial related proposal for Chandanaish Pourashava.

Determination of Standard

According to the standard on Wholesale Market/bazar, 1 acre land is to be provided for every 10,000 populations and 1 acre land for every 1000 population for Retail sale market. Again, 0.25 acre of land is being standardized for per corner shop, 1 acre per neighborhood market, 1.5 to 2.5 acre per super market and 1 acre per 25,000 populations for bank, hotel, garage and godown. The study team has considered 101,498 populations for the study area up to the year 2031. For this population total number of required wholesale market/bazar stands at $(101,498 / 10,000)$, means 10.15 acres land is being needed up to the year 2031 and for retail sale market, 101.50 acres. The planning area already has 7 retail sale market including wholesale market/bazar and a Pourashava market with 30 shops.

Recommendation / Forecast

The study team recommends expansion of present wholesale market/bazar on earmarking land. Necessary planning permission and design criteria will be provided by the Pourashava. The lands may be allowed to use for other commercial purposes like bank, hotel and godown. After necessary adjustment in the existing commercial activity it includes 2 wholesale markets of 6.05 acres, 1 super markets of 3.09 acres, 1 retail market of 15.50 acres, 2 neighborhood markets of 2.43 acres and 2 corner shop lots of 4.99 acres of proposal.

Table 10.8: New Development proposal for Commercial Facilities Zone

Type of Facilities	Ward No.	Mouza Name	Plot No.	Area (acre)
Corner Shop	02	Chandanish JL_23_00	1-7, 9-10, 17-18, 43, 49, 54, 60, 63, 67-68, 75, 93, 204-205, 207, 209, 256, 295-296, 301, 1284	1.64
	05	Horla JL_11_03	2-7, 16, 19-22, 24-28, 34, 75, 79-81, 84, 85, 599, 609, 629, 630, 677, 687, 13637, 13676, 13678	3.35
Neighborhood Market	01	Uttar Joara JL_13_04	9082-9084, 9086-9089	1.83
	04	Horla JL_11_01	84, 93, 95-96, 985, 992, 994, 997-998, 1027, 1028	0.6
Retail Market	06	Horla JL No_11_02, Dakkhin Joara JL_24_00	4-12, 15-17, 21, 22, 26-28, 38-41, 43-49, 52, 53, 58-60, 63, 64, 66, 71, 74, 75, 77, 78, 82, 83, 86, 87, 89, 92, 95-99, 527-529, 531-548, 554-558, 560, 6946, 6948, 6965, 6967, 7100-7104, 7113, 7118-7120, 7123-7125, 7128-7137, 7142-7144, 7147, 7150, 7151, 7167, 7172, 7173, 7176, 7180, 7181, 7184, 7188, 7190, 7193, 7194, 7200, 7216, 7325, 9370	15.5
Super Market	09	Gacbaria JL_22_02	5571, 5572, 5595-5600, 5602, 5603, 5605-5607, 5705-5716, 5726-5729	3.09
Wholesale Market	02	Chandanish JL_23_00	1, 2, 6, 67, 76, 77, 85, 87, 1266, 1269, 1274, 1275, 1278, 1284, 1289, 1295, 1296, 1304	1.98
	06	Dakkhin Joara JL_24_00	134, 156-158, 161-194, 200, 203, 205-212	4.07

7) General/Heavy Industrial Zone

General industries are the Green and Orange A categories as per The Environment Conservation Rules, 1997. The general industrial zone is intended to provide locations, where general industrial establishments can be set up and function without creating hazards to surrounding land uses. As a small urban centre it is unlikely that any major industrial concern will find its place here in future. This zone has an area of 42.06 acres (0.9% of the existing Pourashava area). Since there is no industrial agglomeration on the town, the industrial zone will be meant for new industries. In this zone, a complex line of industrial and supporting non-industrial land uses will be permitted as per Table-A.3, ANNEX-6 and conditional permission will be given to a number of other land uses as specified on Table-A.4, ANNEX-6. Table 1.9 shows plot wise important general industrial related proposal for Chandanaish Pourashava.

Determination of Standard

According to the standard, land is being allocated as 1.5 acres for every 1000 populations in case of small-scale industry, 5 acres per 10000 populations for heavy industry and service industry and 1 acre per 1000 population for cottage/agro-based industry. The study team has estimated 101,498 populations for the planning area up to the year 2031. Total required land for industry stands at (101498 / 1,000), means 152.25 acres land for small-scale industry and 101.50 acres for cottage/ agro-based industry up to the year 2031.

Recommendation / Forecast

The study team recommends planned formation including grouping of industries on different locations. Under industrial zone, the consultant has particularly proposed 1 small scale industries of 20.28 acres and 1 agro-based industry of 21.47 acres which represent 41.75 acres of land in total. Necessary planning permission will be followed by the Pourashava.

Table 10.9: New Development proposal for General/Heavy Industrial Zone

Type of Facilities	Ward No.	Mouza Name	Plot No.	Area (acre)
Agro based Industry	08	Gacbaria JL_22_02	7055, 7063, 7064, 7068-7157, 7161-7169, 7171-7183, 7187-7257, 7259-7266, 7300, 7301, 7304-7313, 7322-7342, 7344, 7346, 7350, 7499	21.47
Small Scale Industries	09, 08	Gacbaria JL_22_01	3466, 3467, 3471-3512, 3621-3676, 3678, 3680-3707, 3735, 6962-6975, 6977-6982, 6986-6990, 6993-7055	20.28

8) Mixed Use Zone

Mixed use zones have been recommended to allow some flexibility in development. In a small town like Chandanaish, 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 0.15 acres. This zone will allow residential structures together with commercial uses as listed in Table-A.11, ANNEX-6, and conditional uses as listed in Table-A.12, ANNEX-6.

9) Circulation Network

In total 290.93 acres or 6.22% of the existing Pourashava area (including existing circulation network) has been proposed for circulation network for 2031. Road network including primary, secondary, tertiary and local access road falls under this category in Chandanaish. Table 1.10 shows development proposal for Circulation Network and list of proposed road with ID is given in ANNEX-8.

Table 10.10: New Development proposal for Circulation Network

Type of Road	Road Width (Feet)	Total		New Road		Road Widening	
		Length (km)	Area (Acre)	Length (km)	Area (Acre)	Length (km)	Area (Acre)
Local Road (as it is)	10	24.8	18.99	-	0	-	0
Tertiary Road	20	37.74	62.18	0.72	1.08	37.02	61.1
	30	12.96	29.58	-	0	12.96	29.58
Secondary Road	40	13.01	42.25	0.68	2.04	12.33	40.21
	60	8.55	38.66	0.81	3.66	7.74	35
Primary Road	80	13.48	74.86	4.38	27.98	9.1	46.88
	160	2.03	24.41	-	0	2.03	24.41
Total		112.56	290.93	6.59	34.76	81.18	237.18

Note: 18.99 acres of road has been kept as it is existed and not included in the road plan proposal area. Therefore, total proposed road network has been comprised of 271.94 acres rather than 290.93 acres.

10) Transport and Communication

Under transportation facilities, both transport and communication services are considered. For Chandanaish Pourashava, this category includes bus terminal/ stand, filling station, garage, passenger shed, ticket counter, transport office etc. There is no bus and truck terminal in Chandanaish pourashava. The area coverage of the proposed bus terminal and truck terminal are 4.09 acres and 1.69 acres respectively. These two terminals will act as multimodal transport terminal jointly. Besides, 9 Tempo Stands are earmarked at 5 wards with an area of 8.58 acres and 2 Rickshaw/Van stands with an area of 0.59 acres are proposed here for Chandanaish Pourashava. Table 1.11 shows plot wise important Transportation Facilities proposal for Chandanaish Pourashava.

Table 10.11: New Development proposal for Transport and Communication

Type of Facilities	Ward No.	Mouza Name	Plot No.	Area (acre)
Baby taxi/Tempo Stand	06	Horla JL No_11_02 Dakkhin Joara_JL_24_00	9, 46-48, 98, 6843- 6845, 6850-6851, 6856	0.6
Bus Terminal	08, 09	Gacbaria JL_22_02	5607-5613, 5662-5665, 5676-5692, 5729, 6214	4.09
Rickshaw/Van Stand	02	Chandanish JL_23_00	1284, 2, 91, 94	0.17
	06	Horla JL No_11_02	31, 37, 47, 52, 53, 6843-6845, 6851	0.42
Tempo Stand	01	Uttar Joara JL_13_04	9073, 9077, 9078, 9087	0.06
		Gacbaria JL_22_01	434, 438-442, 448-451, 508	0.46
		Uttar Joara JL_13_04	8956, 8992-9005, 9011-9016, 9019, 9022, 9073, 9077-9087	2.45
	02	Chandanish JL_23_00	1284, 38, 40	0.28
	04	Horla JL No_11_02	43, 59-60, 67-69, 6562, 6570	0.35
		Horla JL No_11_02	5875, 5876, 5921, 5922	0.25
	06	Dakkhin Joara_JL_24_00	244-248, 250	0.17
		Dakkhin Joara_JL_24_00	264, 269, 270, 284-286, 288, 289, 291-294, 300, 302-309, 2000-2008, 2012, 2013, 2016, 2022, 2867- 2869	4.34
Truck Terminal	09	Gacbaria JL_22_01	2282-2286, 2290, 2300	0.22
		Gacbaria JL_22_02	5461, 5576, 5583-5591, 5594, 5596, 5607	1.69

11) Utility Services

A number of utility establishments are required in a town to run services properly. Utility services include Overhead Tank, Power Office/Control Room, Public Toilet, Sewerage Office, Waste Disposal, Site, Water Pump House, Water Reservoir, Water Treatment Plant, Waste transfer station etc. The consultant has earmarked area for utility services, like, solid waste disposal site with an area of 7.92 acres has been proposed. There will be 9 waste transfer stations for collection of solid waste located at suitable locations. A dumping site will be developed over an area of 4.70 acres for final disposal of the solid waste proposed at the location of the south-west corner of Tabga Mouza. There is an electric sub station at the outer east of the pourashava beside Halima dighi. This sub-station will be enough for next 20 years. So, no additional electric sub-station has proposed here. Table 1.12 shows the plot wise important Utility Services proposal for Chandanaish Pourashava.

Table 10.12: New Development proposal for Utility Services

Type of Facilities	Ward No.	Mouza Name	Plot No.	Area (acre)
Fire Service	03	Uttar Joara JL _13_01	2295, 2298, 2302-2308, 2310-2319, 2321-2325, 2330-2335, 2338	2.56
Public Toilet	09	Gacbaria JL _22_02	5585-5587, 5589, 5594-5597, 5607	1.43
Solid Waste Disposal Site	01	Uttar Joara JL _13_01	270, 480-485, 492-496, 498-520, 555-561, 566-576, 578-589, 618-620	7.92
Waste Transfer Station	01	Gacbaria JL _22_01	580, 607, 608	0.05
	02	Chandanish JL _23_00	57,58	0.04
		Chandanish JL _23_00	76, 1188-1190, 1284	0.21
		Chandanish JL _23_00	15,16	0.13
	03	Uttar Joara JL _13_01	2551-2555	0.1
	09	Gacbaria JL _22_01	1962, 1963	0.07

12) Community Facilities

All community facilities including funeral places (i.e. graveyards) and other religious uses denoted as community facilities. This zone earmarked with an area of 34.66 acres designated up to 2031 and it covers about 0.74% of the existing Pourashava area. Table 1.13 shows plot wise important Community Facilities proposal for Chandanaish Pourashava.

Determination of Standard

The standard suggests 1 acre per 20000 for the community centre, Graveyard/ Burial ground and Eidgah. Again, 0.5 acre per 20,000 populations prescribed for Mosque/Church/Temple.

Recommendation/ Proposition

The study team recommends 1 eidgah with 3.16 acres of land and 5 new community centers on 5.11 acres of land. Areas for Mosque/Church/Temple, Post office, Fire service station and T&T are needed to be readjusted within existing areas.

Table 10.13: New Development proposal for Community Facilities

Type of Facilities	Ward No.	Mouza Name	Plot No.	Area (acre)
Central Eidgah	02	Chandanish JL _23_00	75, 76, 84, 87-88, 474, 477-481, 486, 489, 1284	1.26
Community Center	01	Gacbaria JL _22_01	310, 314-318, 320, 321, 329	0.46
	04	Horla JL No_11_02	1-4, 45-52, 56, 85, 86, 89, 90, 96, 6537, 6577-6579, 6587, 6588, 6594	1.2
	05	Horla JL_11_03	7, 8, 11-14, 20, 53-55, 57-58, 71, 95, 470, 482, 506, 508, 12468, 12469, 12500, 12509, 12510, 12515, 12519, 12523, 12556	1.8

Type of Facilities	Ward No.	Mouza Name	Plot No.	Area (acre)
	07	Chandanish JL_23_00	1, 2, 4, 8-10, 25, 555, 556, 907, 921, 924, 926, 930	0.82
	08	Gacbaria JL_22_02	6283, 6284, 6286-6288, 6290, 6291, 6386, 6389-6393, 6396	0.83
Eidgah	07, 09	Chandanish JL_23_00 Gacbaria JL_22_01	7, 2669-2675, 2678-2681, 2684, 2685, 2687-2692, 2709, 2712, 3021	3.16

13) 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. The Pourashava has a vast area of agricultural land that demands formation of a separate zone like, agriculture zone. Agriculture zone is primarily meant for agriculture; land uses related to it and land uses that support it. Detail of land uses is presented in *Table-A.17, ANNEX-6* and conditional uses as listed in *Table-A.18, ANNEX-6*. The total area will stand at 2120.39 acres (45% of the existing Pourashava area) after the urban area plan been implemented within 2031.

14) Open Space

Recreational and sport facilities without or with minimum building structure i.e. Playground, Botanical Garden, Stadium, Zoo etc. will be listed and proposed under Open Space zone. This zone has been provided to meet the active and passive recreational needs of the people and at the same time, conserve the natural resources. Total area earmarked for this zone stands at 177.21 acres (3.66% of the existing Pourashava area). The details of permitted and conditional permits have been presented in *Table-A.19, ANNEX-6* and conditional uses as listed in *Table-A.20, ANNEX-6*. *Table 1.14* shows plot wise important open space proposal for Chandanaish Pourashava.

Determination of Standard

According to the standard, 1 acre of land is to be provided for every 20,000 population for cinema/theatre, 5 to 10 acres land for stadium/sports complex and 1.75 acres land per 10,000 populations for a neighborhood/ community park. The study team has estimated 101,498 populations for the planning area up to the year 2031. For this population total land required for cinema / theatre stands at (101,498 / 20,000), means 5.0 acres of land is being needed up to the year 2031, 10.0 acres for stadium and 101.50 acres for park.

Recommendation/ Proposition

The study team recommends 15 play field/ ground of 28.43 acres, a central park on 27.70 acres of land and 6 Neighborhood/ Community park on 55.17 acres of land.

Table 10.14: New Development proposal for Open Space Zone

Type of Facilities	Ward No.	Mouza Name	Plot No.	Area (acre)
Central Park	04	Horla JL No_11_02	1-30, 32-46, 48-52, 56-58, 62, 67, 69, 71-76, 80, 84-86, 89, 91-99, 120, 5200, 5203, 5212, 5213, 5223, 5224, 5805, 5807, 5813, 5817-5821, 5823-5825, 5827, 5834-5837, 5844-5855, 5859-5861, 5863, 5872, 5876, 5880-5883, 5885, 5887-5890, 5893, 5899, 5900, 5902-5904, 5906, 5910, 5921, 5970, 5998, 6000-6002, 6008, 6015, 6017, 6022, 6032, 6033, 6036, 6037, 6042, 6045, 6047, 6049, 6051, 6052, 6082, 6083, 6086-6088, 6090, 6096, 6100, 6103-6106, 6109, 6116, 6120, 6122-6125, 6127, 6128, 6134, 6135, 6137, 6138, 6142, 6143, 6147, 6150,	27.7

Type of Facilities	Ward No.	Mouza Name	Plot No.	Area (acre)
			6157, 6168, 6169, 6171, 6181, 6192, 6194, 6196, 6199-6203, 6206, 6207, 6218, 6229-6231, 9371, 9372	
Neighborhood Park	02	Chandanish JL_23_00	1, 4-6, 8, 9, 11, 12	1.07
	03	Uttar Joara JL_13_04	8502-8511, 8681	0.94
	05	Horla JL_11_01	26, 29, 31, 35, 37, 41, 42, 45, 53, 419, 425, 432-434, 436, 439, 440, 443, 444, 446-452, 454-458, 460, 461, 499, 501-504	7.06
	06	Dakkhin Joara JL_24_00	2070-2094, 2097, 2099-2131, 2163-2166, 2182-2185	5.41
	08	Gacbaria JL_22_02	1-6, 25, 28-31, 36, 5929, 7862, 7870-7880, 8396-8447, 8449, 8450, 8453-8456, 8468-8471, 20024	13.15
	09	Gacbaria JL_22_01 & 02	906-941, 1100, 1175-1178, 1180-1182, 1184-1208, 1210-1215, 1217-1234, 1238-1253, 1575, 1703, 1705, 1707-1734, 1736-1739, 2776, 2779, 2780, 2786, 2968-2990, 2992-3001, 3003-3015, 3018-3021, 5790-5797, 5807-5809, 5813, 5868-5875, 5877-5882, 5884-5894, 5902-5908, 5921-5929, 6078-6081	27.54
Playground	01	Gacbaria JL_22_01	457, 460-464, 466-467	0.16
		Uttar Joara JL_13_04	8962, 8968-8983, 8988-8993, 9016-9018, 9214-9218, 9222, 9224-9229, 9249, 9250	3.48
	02	Chandanish JL_23_00	2, 6, 7, 27, 37, 40-43, 220, 223, 228, 279	0.95
	03	Uttar Joara JL_13_04	8653, 8654, 8665, 8666	0.25
		Uttar Joara JL_13_04	8584-8592, 8594, 8595, 8601-8605	0.66
	04	Horla JL_11_01	71, 72, 78, 91, 985-987, 990	0.44
		Horla JL No_11_02	1-3, 5, 7-10, 12, 29, 33, 35, 40, 41, 46-48, 50, 51, 53, 56, 57, 59-68, 70, 72, 74, 76, 81, 82, 90, 93, 94, 99, 5298, 5300-5302, 5327, 5328, 5334, 5337, 5344, 5345, 5349, 5352, 5354, 5355, 5369, 5375, 5395, 5396, 5398-5400, 5757, 5758, 5762, 5766, 5772, 5774-5776, 5780	5.81
	05	Horla JL_11_03	12562, 12592	0.23
	06	Dakkhin Joara JL_24_00	341, 342, 344, 345, 363, 364, 375-377, 2877	2.7
	07	Chandanish JL_23_00	20, 23, 24, 27, 28, 89, 91, 93, 2482, 2484-2488, 2490, 2495, 2496, 2517, 2518, 2521, 2522, 2525, 2526, 3082	4.98
		Chandanish JL_23_00	2-4, 9, 14-16, 18, 19, 68, 87, 88, 96-99, 2665, 2700, 2705-2708, 2710, 2711, 2713, 2717, 2723, 2881, 2900	3.37
	08	Gacbaria JL_22_02	8809, 8010	0.11
		Gacbaria JL_22_02	6189, 6197, 6201-6203	0.39
	09	Gacbaria JL_22_02	2269-2272, 2275-2277, 2280`	0.22
		Gacbaria JL_22_02	2100-2102, 2131-2135, 2140-2143	0.66
		Gacbaria JL_22_02	1811, 1814-1821, 1823, 1828, 1845-1847, 1914, 1915, 1918-1920, 1922-1925, 1927-1953, 1979-1987, 1989, 1990, 1992-1996, 2882, 2883, 2898	4.02

15) Water bodies

The ponds with an area equal to or more than 0.15 acres will be preserved as the water retention ponds. 381.78 acres or 8.16% of the existing Pourashava area is preserved as waterbody. These will act as water retention area which includes ponds, water tanks, natural khals and irrigation canals. The plan suggests preserving most of these water bodies for two purposes, first, to serve as source of water, second to serve as water retention area during monsoon. There will be permitted uses in this zone as stated in *Table-A.23, ANNEX-6* and allow some other uses conditionally as stated in *Table-A.24, ANNEX-6*.

16) Urban Deferred

The Urban Deferred refers to lands lying outside of the urban growth boundary and identified as Urban deferred and encompassed by the Urban Deferred Boundary. According to planning standard provided by LGED seeks about 10 percent of the total build up area. The total area under this use has been proposed as 229.84 acres or 4.91% of the existing Pourashava area that include existing and proposed land uses. A portion of this zone may use for housing of the poor, disadvantages and refugee for climate change and other disasters to fulfill National Housing Policy, Disaster Policy and other policy prescriptions of the Government.

10.3 Land Use Proposals

10.3.1 Introduction

According to the East Bengal Building Construction Act 1952 (amended 1987), each and every building within the designated areas of City 'Master Plan', needs approval from the City Development Agencies.

Therefore, Pourashava authority is the implementing agency for execution the land uses control, proposed in the master plan. Thus town planning department of any city development authority issues NoC for each and every building of the city jurisdiction area.

Core area of the Chandanaish Pourashava is already developed as mixed-use area due to the absence of development control. Commercial, residential, administrative, educational uses are admixture in the core area. Zoning provision, landuse control should not be enforced in such type of the core area. At present, Chandanaish Pourashava is a spontaneous developed area. Rearrangement of the existing use is not possible. Land acquisition for expansion of some internal road (to increase the width of road) will create socio-political problem. As a result, the roads in the core area and bazaar kept remain same in the proposed plan as on today.

Provision of drainage facilities, arrangement of piped water supply and ensuring fire protection, at least 24 feet width road is necessary. In the Pourashava, except National Highway, such type of road is absent. New road will form new township on agriculture land. These processes will washout agriculture domination from the Pourashava. Compact Township will be effective for new formation, not for the mixed-use areas where most of the roads are 8 to 10 feet width.

10.3.2 Designation of Future Land Use

Issuance of development permit is the most important function of the Pourashava. Development plan will have no bearing unless development is promoted through effective procedure for issuance of building permit. GIS database and other advanced computer software of world standard have been used for the preparation of the plan. Planners with detailed knowledge of this technology are available in the country. This provides the Chandanaish Pourashava a unique

opportunity to make its plan permit issuance procedure fast, well managed and transparent. This is also in line with the idea of digital Bangladesh program of the government.

Each Pourashava will need to setup a separate Land use Permit Authority for implementing the future land uses. Landuse Permit will be issued with the sign of Landuse Permit Planner appointed by the Mayor of the Pourashava from among the Planners not below the rank of Assistant Town Planner. For all plan permits and Land use related activities, Permit Authority shall be accountable to controlled land uses in the Pourashava.

10.3.3 Land use Zoning

Land use Zoning is a form of legal power which is delegated to Chandanaish Pourashava through enabling legislation to ensure the welfare of the community by regulating the most appropriate use of the land. Zoning is a classification of land uses that limits what activities can or cannot take place on a land parcel by establishing a range of development options. Land use zoning is a legal instrument by application of which a Pourashava can control,

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

Zoning can be of three types, Area Zoning, Density Zoning and Height Zoning.

Area Zoning

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

Density Zoning

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

Height Zoning

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

Proposed Landuse Zones

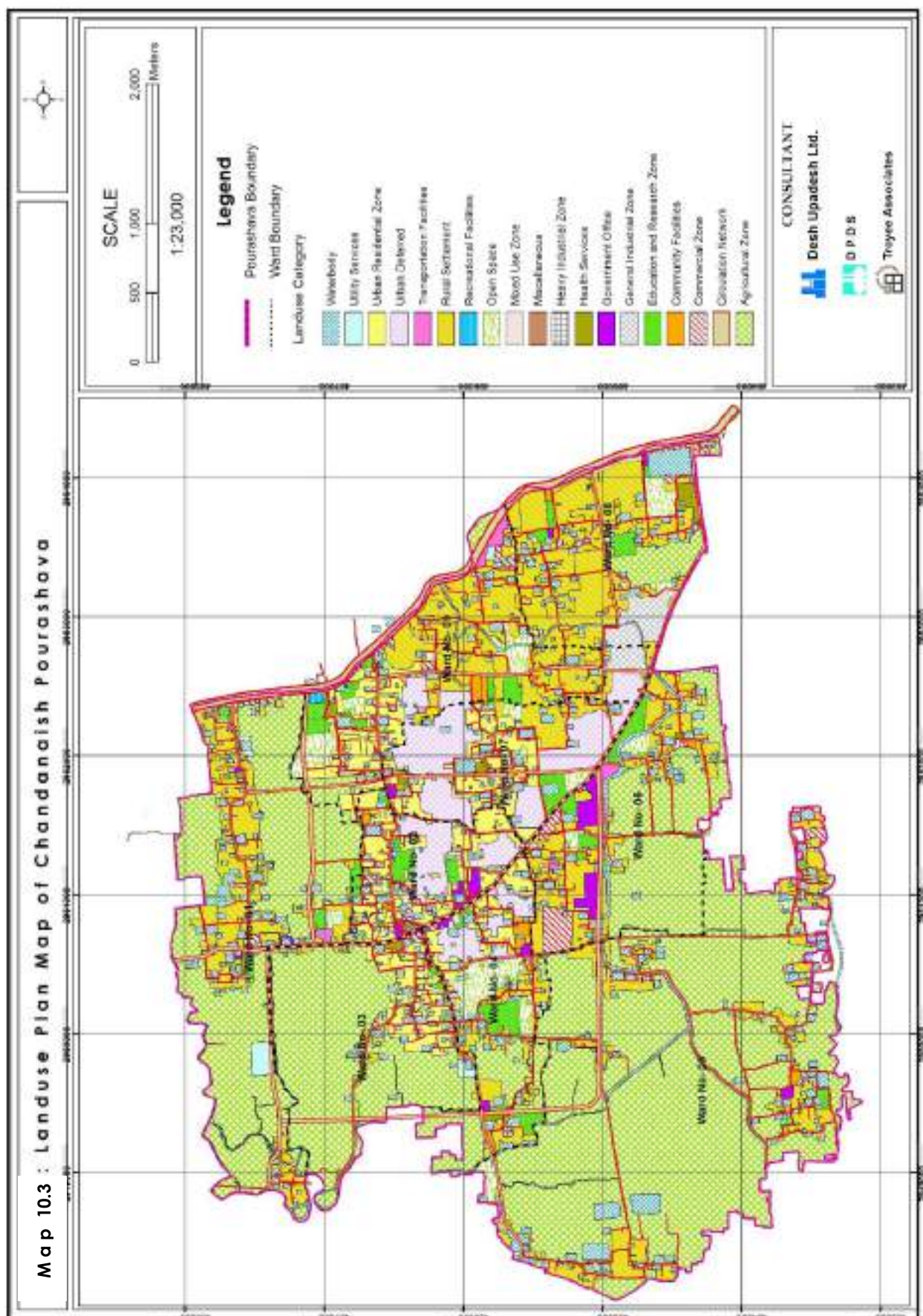
Urban area plan proposals cover the entire project area of 4676.46 acres of Chandanaish Pourashava as it has been envisaged in the ToR. The plan map has been prepared on mouza base and presented at a map scale of **1:9000** (*ANNEX-10B*) and in *Map 1.3*. In the plan proposal, the entire project area has been divided into landuse zones in the light of guidelines provided in the Structure Plan.

Plan proposal includes designation of the project area into various types of landuse zones according to use character. The volume of agricultural zone indicates that the project area will maintain its rural character. The only new urban area is the proposed tourist enclave. Spatial development of the project area will be according to following landuse zones.

A.	Urban Residential Zone	L.	Health Services
B.	Commercial Zone	M.	Historical and Heritage Site
C.	General Industrial Zone	N.	Forest Area
D.	Mixed use Zone	O.	Open Space
E.	Education and Research Zone	P.	Recreational Facility
F.	Rural Settlement Zone	Q.	Circulation Network
G.	Transport and Communication	R.	Utility Services
H.	Agricultural Zone	S.	Urban Deferred
I.	Tourist Facilities Zone	T.	Waterbody
J.	Restricted Zone	U.	Miscellaneous
K.	Government Office		

Computerization of the Permit Procedure

Maintenance and management of information of all the development activities within the Chandanaish Paurashava jurisdiction is enormous task. Manual record keeping, as it is done now, leads to unnecessary complexity, which can now be very easily avoided. Consultants' recommendation in this respect is to develop a customize software for this purpose. Qualified software experts are available locally. It will benefit the authority in the form of time and cost saving, management, updating of information, control of malpractice and so on.



10.4 Plan Implementation Strategy

10.4.1 Land Development Regulations to Implement the Landuse Plan

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

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

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

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

1. To control the air, water, noise and soil pollution, Conservation of Environment and Pollution Control Act, 1995 (Act No. I of 1995) was enacted. In the Pourashava, there is no authority for enforcing the provisions prescribed in the said Act. The pollution related with the implementation of landuse component may be controlled with this Act.
2. Impose control on all type of buildings in the Pourashava according to the setback rule prescribed in the Building Construction (Amendment) Rules, 1996 (Notification No. S. R. O. No. 112-L/96). Building permission for extended areas shall be according to the landuse provision prescribed in the plan. Any permission for building construction, front road width shall not be less than 16 ft. and the construction must follow the Building Construction (Amendment) Rules, 1996.
3. Haphazard development of commercial activities is the general scenario of the Pourashava. 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 Pourashava 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 Pourashava 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 Pourashava authority may execute the Ordinance with the authorization of government.

8. The Pourashava 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 landuse provisions.

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

10. In the Pourashava 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 Pourashava authority. A joint coordination cell among those four authorities may control the establishment of factories and industries in the Pourashava.

11. In the Pourashava, 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 Pourashava is regulatory aspects.

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

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

10.4.2 Implementation, Monitoring and Evaluation of the Landuse Plan

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

Objective of a Multi-Sectoral Investment Programme (MSIP) will match a list of the development projects with the funding stream necessary to implement them. There are two basic activities that

would determine the contents of MSIP. One activity would be to prioritize and schedule the investment projects of all public agencies so they will collectively help to achieve the development goals and objectives of the Landuse Plan. Second activity would be to analyze the source and availability of fund for the prioritized list of development projects.

Implementation through Action Plans and Projects:

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

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

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

Development control as an instrument of plan implementation may be selectively applied within the Landuse Plan. Development controls would also be varied in intensity and detail to suit the particular circumstances. It is important that they should be clear and easily understood by all parties concerned. Since the entire Pourashava 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 efficiency of the urban land market would make, more private land available to urban households;
- would pass much of the development costs for local infrastructure to the private sector and land market mechanisms;
- would increase in land for development without large cash outlays by government to purchase land for development schemes; and
- would keep provision of land for community facilities virtually no cost to government.

Plan Monitoring

The Landuse Plan would simply be tools for guiding and encouraging the growth and development of the Chandanaish Pourashava in a preferred manner. In a rapidly changing urban environment, the Landuse Plan would require to keep up to date. If this is not done, within a few years it will be

obsolete. Therefore, it is imperative that the requirement for regular updating of the Landuse Plan be made a legal requirement.

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

Evaluation

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

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

The top level supervision has to be done by a high level supervisory committee headed by Chandanaish Pourashava 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 Pourashava. The committee will supervise implementation works regularly and issue necessary instructions to expedite the works of implementation.

Co-ordination

A Planning Section of Chandanaish Pourashava should have close interaction with the citizen of Pourashava 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 Chandanaish Pourashava 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 winning 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

The transport studies were undertaken to determine the traffic and transportation situation in and around of Chandanaish Pourashava. In this context, an attempt was made to ascertain the present traffic pattern, the deficiencies in the system, the problems being faced, transport infrastructure and services available in order to suggest some direction and option for improvement keeping in view the likely growth of the economy.

Traffic congestion is one of the major problems in most of our towns and cities. Managing the transportation system by adding new facilities or by making some operational changes to improve system performance is a common practice. The nature of new facilities or operational changes that has to be affected for a particular place can only be determined through examination of the condition and performance of existing system. Traffic congestion study enables the planning team to suggest for remedial measures in respect of performance of circulation system.

11.1.1 Approach and Methodology

The performance of transportation system largely influences the economy and social progress of an area. It provides mobility to people, goods and particular services to their destination. It has linkages with other sectors of development and for a sustainable balanced development of any area, its traffic and transportation system should be adequately addressed.

The transportation system directs the urban development pattern. An efficient transportation system will enable the project area to develop as an important commercial and industrial centre through proper functioning of its economic activities as well as administrative function thus making it an important place in terms of administrative, social, industrial, commercial, communication.

Therefore, in the process of preparation of master plan of the Chandanaish Pourashava, a proper traffic and transport survey have been carried out to achieve the perfect ideas about the existing transportation situation of the project area. Transport policy, standard and development trend are accommodated to the transport development plan.

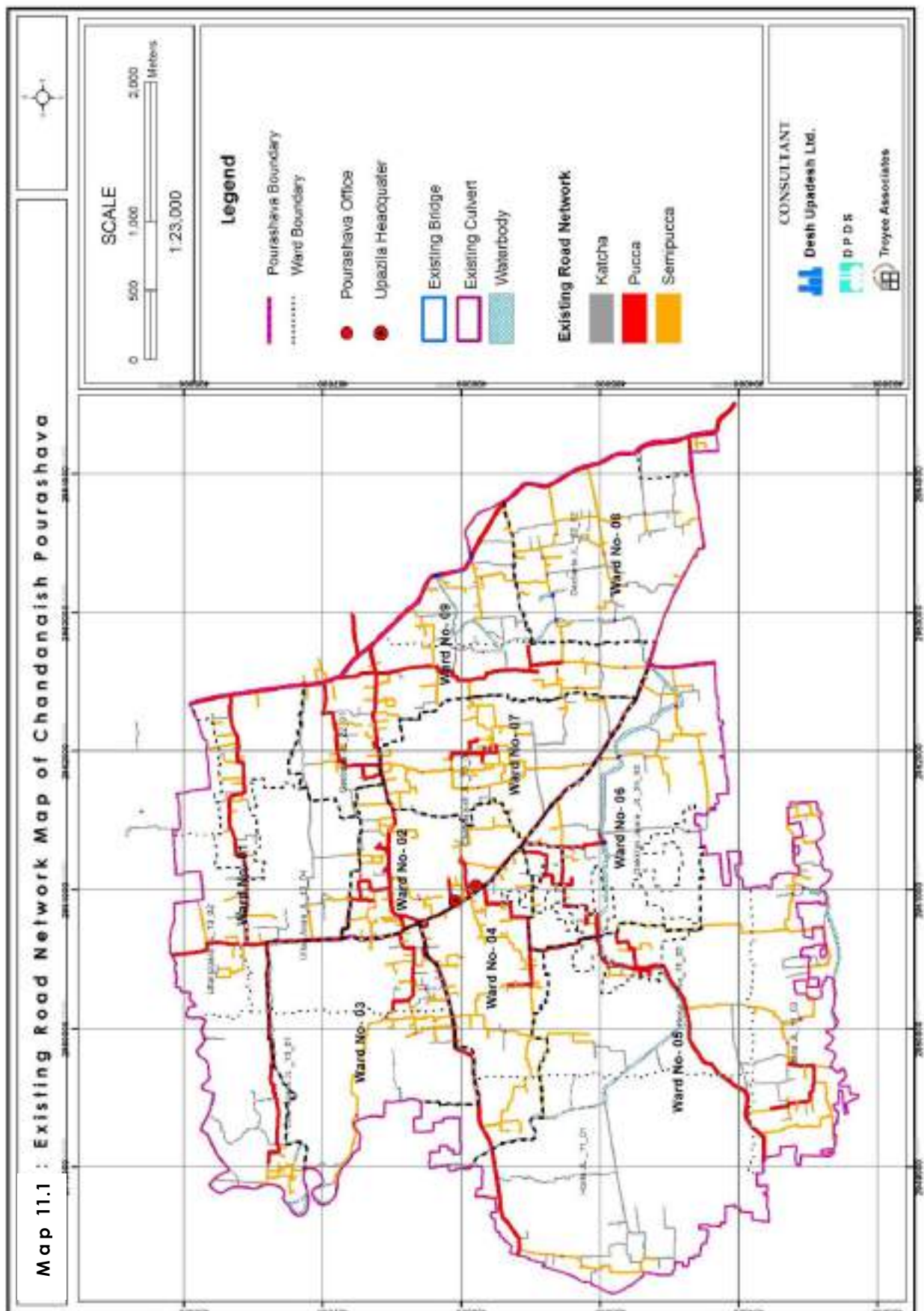
11.2 Existing Conditions of Transportation Facilities

11.2.1 Roadway Characteristics and Functional Classification

According to the Pourashava sources the length of total roads in the Pourashava is 116.06 km. with 29.74 km katcha road, 54.83 km semi-pucca road and pucca road 31.49 km (*Table 2.1*). Besides, the Pourashava has 121 numbers of bridge and culverts including wooden or bamboo built pools.

A major road (Arakan road) passes through the east side of the pourashava connecting Patiya Upazila to Satkaniya (at South side) and Satkaniya Upazila to Patiya (at North side) (*Map 2.1*). Three major roads pass through the town to different urban centers from an intersection known as Chandanaish Upazila Mor. The major secondary and tertiary roads coming from three directions meet together at the Thanar Mor. The routes coming from different places to the project area are:

- | | |
|--------------------------------------|----------------------------------|
| (i) Upazila road to college road | (vi) Bagicha road to Satbaria |
| (ii) Upazila road to Noiahat | (vii) Bagicha road to Chittagong |
| (iii) Upazila road to Borkol road | |
| (iv) College mor to upazila road | |
| (v) Bagicha Hat to Cox's bazaar road | |



Roads and Highways (R&H) Roads

Chandanaish Pourashava has only one R & H road which extends 5 km connecting Patiya and Satkaniya Upazila. This is crossing just east side of the pourashava and it is the main road within the jurisdiction of the pourashava.

Local Government Engineering Department (LGED) Roads

LGED maintains 11.2 km of roads within the Chandanaish Pourashava. These are Chandanaish-Upazila Road, College Road, Barkol Road, Gachbaria Bodurpara Road, Probottok Road Road. Map 2.1 shows the circulation network of Chandanaish Pourashava.

Important Local Roads

The Pourashava has so far developed 99.86 km of roads within its area with different width. They are also responsible for maintaining the roads.

Table: 11.1 List of all existing road network

Types of Road	Length (km)	Area in acre	Remarks
Pucca (bituminous)	31.49	30.16	-
Semi-pucca (HBB)	54.83	30.38	-
Katcha (earthen)	29.74	17.61	-
Total	116.06	78.26	-

Source: Traffic Survey 2009

11.2.2 Mode of Transport

Road transportation is the major transportation systems available in the Pourashava. Regular bus services are available in the Chittagong-Chandanaish-Cox's Bazar highway that passes through the east side of pourashava. Bus, minibus and microbus are available at the Pourashava area. Internal movement is available is rickshaw and auto-rickshaw. Almost all types of vehicles are found to operate in the project area, starting from pushcart to modern cars and luxury buses and their number is increasing every year. Table 2.2 shows the available motorized and non-motorized operated in the Pourashava area.

11.2.3 Intensity of Traffic Volume

The 15 hours traffic survey conducted at 3 major Intersections has been compiled and combined of both way traffic for all the 3 survey locations have been computed. Following summary table showing the vehicle category wise daily traffic of all the 3 locations is presented in Table 2.2. It is revealed that auto rickshaw is found prominent in all major intersections in the Chandanaish Pourashava followed by Motorcycle. About 36.55 percent, 36.92 percent and 37.29 percent auto rickshaws are found respectively in the intersection of Bagicha Hat, College Mor and Upazila Mor.

Table 11.2: Daily 18 Hours (6:00 to 24:00) Traffic Volume in the Chandanaish Pourashava

Name of the link	Daily 18 hours Traffic									Total
	Motorized						Non-motorized			
	Bus	Truck	Car/ Microbus	Auto Rickshaw	Motorcycle	Sub-Total	Cycle Rickshaw	Bicycle	Sub-Total	
Arakan Road to cox's bazar	209	267	791	2948	772	4987	651	307	958	5945
Arakan Road to Satbaria	86	179	672	971	2736	4644	2417	395	2812	7456
Arakan Road to Chittagong	746	219	757	675	542	2939	675	542	1217	4156

Name of the link	Daily 18 hours Traffic									Total
	Motorized						Non-motorized			
	Bus	Truck	Car/ Microbus	Auto Rickshaw	Motorcycle	Sub-Total	Cycle Rickshaw	Bicycle	Sub-Total	
TOTAL	1041	665	2220	4594	4050	12570	3743	1244	4987	17557
College More to Cox's bazar	209	267	791	2948	772	4987	651	307	958	5945
College More to Upazila	90	172	625	996	2701	4584	2399	519	2918	7502
College More to Chittagong	746	219	757	675	542	2939	675	542	1217	4156
TOTAL	1045	658	2173	4619	4015	12510	3725	1368	5093	17603
Upazila to College Road	203	87	784	2801	750	4625	627	315	942	5567
Upazila To Noiahat	0	27	672	971	2736	4406	2417	395	2812	7218
Upazila to Borkol Road	732	195	681	606	495	2709	643	493	1136	3845
TOTAL	935	309	2137	4378	3981	11740	3687	1203	4890	16630

Source: Traffic Survey 2009

11.2.4 Facilities for Pedestrians

Major three roads of the Chandanaish Pourashava have lacking footpath. Pedestrians movement takes place on the carriage way and sides of the roads. As a result minor accident occurred with the collision of rickshaw, van and sometimes with the babi taxi. Traffic congestion is occurred during peak pedestrian movement when schools and offices are starting and ending at the morning and the evening.

11.2.5 Analysis of Existing Deficiencies

There is no traffic police found to manage any traffic in the Chandanaish Pourashava. Rickshaw, Baby taxi and traffic are taking their parking on the roadsides with their management. There is no designated parking in the Chandanaish Pourashava. Most of the traffics are parked haphazardly beside the roadsides and in the junction point of the major road. No traffic signal operation is found. Auto Rickshaw and Cycle Rickshaw reduced the road capacity by the frequent stopping at the intersection.

As the population density is comparatively low and economic activities are also at low, the study area does not face any traffic congestion. Where ever some congestion occurs are due to parked jeep in intersections, road side waiting for passengers by buses, on street loading and unloading of goods and passengers by all types of vehicles.

Most of the hat, bazaar and market places are the major traffic generation centre in the Pourashava area. Chandanaish to Chittagong Road intersection and Chandanaish bazaar area, forest office mor are the major traffic congestion areas in the Pourashava area.

11.2.5.1 Roadway Capacity Deficiencies

There are quite a number of bazaars inside the Pourashava area facilitating exchange of rural products. These bazaars are in fact engines of growth in the rural context. Access to these hat and bazaars are by various types of vehicles is served by roads. But the area is not served by well-defined road hierarchy, nor is required now due to sparse use of these roads by motorized transport. However, the induced activities due to the prospect of upward economic change may need to provide road network befitting with the need which will be done in the draft planning stage.

Highway traffic is comparatively high dominated by mixed types of vehicles including non-motorized ones. Generally, surface of the highways excepting for a small part is excellent. The road network is not facilitated by designated parking area, bus terminal and bus bay. As a result, sometimes congestions and chaotic situation occur for a little while. In spite of this situation, the present road network is functioning well. But it has to be upgraded to accommodate the future increase of volume of traffic that is expected to grow due to enhanced future economic activities.

11.2.5.2 Operational, Safety, signal and other deficiencies

There is no traffic police found to manage any traffic in the Chandanaish Pourashava. Rickshaw, Baby taxi and traffic are taking their parking on the roadsides with their management. There is no any space for pedestrian movement. Pedestrian movement observed on the right of way of and carriageway of the street. Traffic signals management is totally absent. Roads widths are not maintained uniform. Encroachments of shops and houses forced to narrow down part of several roads widths.

Road geometry is not maintained. Next to infrastructure, utility services are the vital supports for civilized people to carry on their livelihood. Energy, water, drainage, sewerage or solid waste management etc. is so obvious elements that one cannot think without them. Roadside drainage is the most crucial issue that has direct and immediate impact on the easy and smooth traffic movement. Most of the roads in the Chandanaish Pourashava are not furnished any drainage network. As a result, roads are often inundated during instant rain.

11.2.6 Condition of other Modes of Transport (Rail/Water/Air)

There is no railway, water way & airway communication within or with Chandanaish Pourashava to any district of Bangladesh. Air services have been provided from Cox's Bazar/ Chittagong Air Port.

11.3 Future Projections

11.3.1 Travel Demand Forecasting for Next 20 Years

Capacity of a roadway largely depends on number of lane, road width and roadway condition. However, standard width of the surveyed roads can be allocated by comparing with recommended design capacity of urban roads shown in the *Table 2.3*. It is revealed from this table that 2 Lane with 20 ft to 24 ft is assumed to be 800 PCUs to 1200 PCUs per hour. Two of the 3 major roads of Chandanaish Pourashava are not equal to 20 ft width that will be needed to further expansion. The calculated PCUs of 3 major roads in the Chandanaish Pourashava are within the range of 11820 PCUs to 13241 PCUs, which are far below from the recommended road design capacity on the basis of PCUs. Therefore, despite of well traffic circulation, existing roads need to be at least 20 ft width with 2 Lane roadway circulations.

Table 11.3 Recommended Design Capacities for Urban Roads

Name of Lanes	Width of Pavement	Capacity in P.C.E. per Hour		Remarks
		All purpose (a) road, no waiting restriction on parking vehicles, high capacity junctions	All purpose (b) road, capacity severely restricted by waiting vehicles and intersections	
2 Lane	20' (6.1m)	800	300 to 500	For both Direction
	22' (6.7m)	1000	450 to 600	
	24' (7.3m)	1200	600 to 750	
3 Lane	30' (9.1m)	1600	900 to 1300	For both Direction
	33' (10.0m)	1800		
4 Lane	40' (12.2m)	1200	800 to 900	For both Direction
	22' (13.4m)	1350	900 to 1000	
	48' (14.6m)	1500	1000 to 1200	
6 Lane	60' (18.3m)	2000	1300 to 1700	For both Direction
	66' (20.1m)	2250	1500 to 2000	
	72' (21.9m)	2500	1600 to 2200	

Source: RDSPS= Rajshahi Development Structure Plan Studies, 2007

11.3.2 Transportation Network Considered

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

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

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

In the Transportation Plan, north, south, east and west direction links with the Pourashava have been considered. To maintain an effective linkage, the plan proposes some secondary and tertiary roads.

11.3.3 Future Traffic Volume and Level of Service

Determination of the standard of performance of a particular road intersection, as well as, individual road section depends upon the Volume-capacity Ratio (V/C Ratio). The V/C ratio is defined as the ratio of maximum actual volume of traffic in the peak hour in a roadway, expressed in PCUs per hour to capacity of that roadway expressed in PCUS per hour. So, the individual peak hours traffic survey conducted for 3 major Intersections road sections, has been identified and then multiplied with the value of equivalency factors, as given in *Table 2.4*, the peak hour traffic in terms of the PCUs are determined for all the 3 traffic survey locations. On the other hand, the percentage of Motorized vehicles is highest (71.60%) on the Bagicha Hat intersection and lowest (53.93%) in the Upazila Mor intersection.

Table 11.4: Summary Table showing the Peak Hour Traffic Volume

Sl. No.	Name of the Intersections	Width of Road (ft)	Peak Hour Traffic Volume		Percentage		Peak Hour Time period
			Vehicle No.	PCUs	Motorized	Non-Motorized	Period
1.	Bagicha Hat	29.53	17,557	13240.20	71.60	28.40	09:00-10:00
2.	College Mor	16.40	17,603	13198.10	71.07	28.93	10:00-11:00
3.	Upazila Mor	13.12	16,630	11820.50	70.60	29.40	08:00-09:00
Average Motorized and Non-Motorized					71.09	28.91	

Source: Traffic Survey 2009

As mentioned above, existing road networks are quite enough for accommodating existing volume of traffic. The project area is rural in nature except some places of both sides of the Chandanaish-Cox's Bazar highway. Most of the roads are semi-pucca and katcha. Thus, semi-pucca needs to be made pucca and katcha road needs to be at least semi-pucca. Katcha roads become clayey in the rainy season and bring immense sufferings for the users. As a result, social, cultural and economic activities are disrupted significantly at that time. There is no waterway transportation and railway services within the Chandanaish Pourashava. Therefore, extending of the existing road network with adequate widening will have to be done according to the provision of standard.

11.4 Transportation Development Plan

Following are the suggested planning standards of (Table 2.5). 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 current series of plans.

Table 11.5: Proposal for Road Standard in the Project area

Road Category	Recommended RoW (Feet)
Pourashava primary roads	150 – 100
Pourashava secondary roads	100 – 60
Pourashava local roads	40 - 20

Source: Upazila Towns Infrastructure Development Project

Standard Road Design

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

Functions of Roads

Each category of Road has its particular functions to perform. **Access or local Road** carries traffic from buildings to the **Collector or Secondary Road** and collector Road carry traffic to the **Primary Road** and vice versa. In reality, however, it is almost impossible to maintain this hierarchical use of Roads except in an entirely planned area. However, functions will not be dependent on the Road width, rather on the location of the Road, surrounding land use and the link it is providing or the volume of traffic it is carrying. Thus an 80 feet wide secondary Road can become a major Road due to its strategic location and the purpose it is serving.

11.4.1 Plan for Road Network Development

11.4.1.1 Road Network Plan

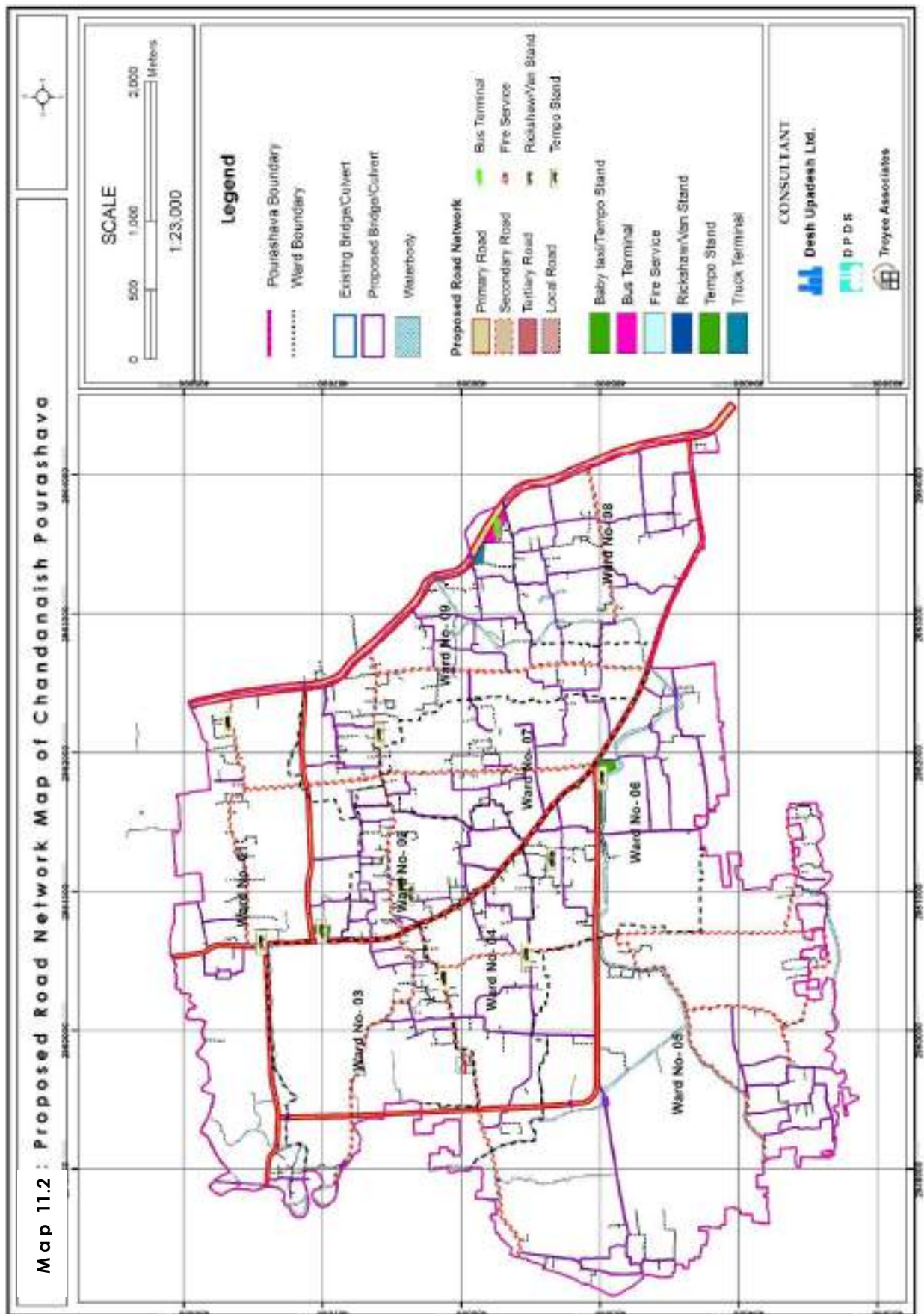
Connectivity is the most important aspect of development of any region. The road system form an effective road network connecting all facilities and establishments to each other. Since highways connect distant regions together 'speed' is the determining factor for highway planning. On the other extreme key function of access road is to provide link to individual households or facilities where 'safety' of the individuals is the prime concern.

Another important aspect is that almost always these road networks physically house other vital utilities of community life – electricity, tap water, gas, sewage disposal, storm water drainage and so forth so that the households come under their services. This calls for careful planning of the road sections off-setting the perennial problem of cutting of road crest causing tremendous problem and discomfort to the people. Table 2.6 shows the brief of proposed road network development of Chandanaish Pourashava. Detail Inventory of Roads is depicted in ANNEX-8 (Map 2.2).

Table 11.6: Proposal for Improvement of the Road Networks (New Road)

Type of Road	Road Width (Feet)	New Road	
		Length (km)	Area (Acre)
Access Road (as it is)	10	-	0
Tertiary Road	20	0.72	1.08
	30	-	0
Secondary Road	40	0.68	2.04
	60	0.81	3.66
Primary Road	80	4.38	27.98
	160	-	0
Total		6.59	34.76

Source: Proposed by Consultants



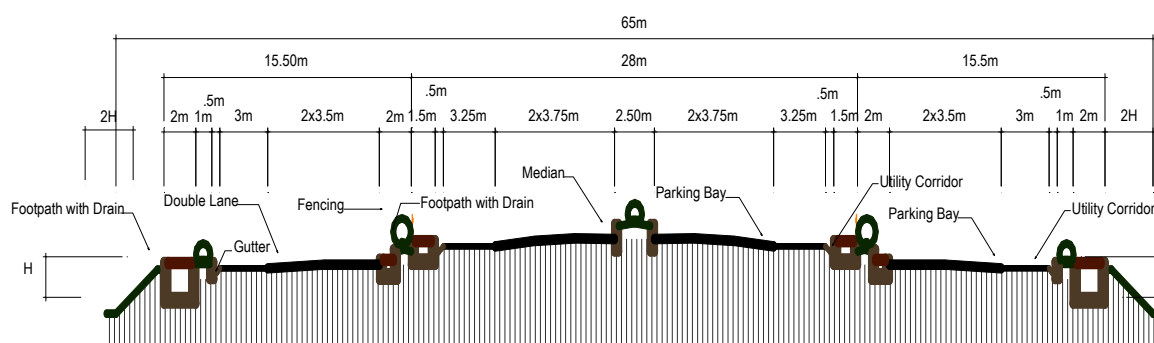
Primary Road

One alternative road link is proposed to offset potential disruption of the core of the Pourashava from the national highway network. The new proposed primary road starts from Upazila Road passes between ward boundary of 6 & 7 to south-west side of ward 1 through ward no. 3, 4 & 5. Due to low flat topography of our countryside as the highway passes through the settlements people use these highways for their localized trips on foot, using non-motorized transport where safety is the major concern. People also use its surface for various purposes ranging from drying of paddy and jute through loading and unloading of goods even down to leisurely recreation. This undesirable mixing of highway and local traffic sharply reduces the speed of highway traffic and impedes the traffic safety.

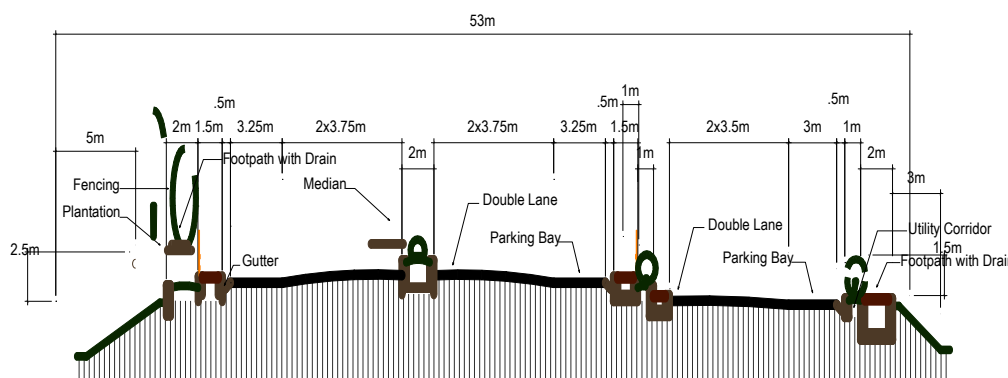
Structure plan policy has stressed on segregation of highway and local traffic. Survey shows that at present more than 25 percent of the total traffic is non-motorized transport. In addition, pedestrian traffic and indigenously made low speed pushcart are often vulnerable during peak hour. On the face of scarce quality roads these huge local population deserve legitimate share of road.

Geometric Solutions

Existing Chittagong-Chandanaish-Cox's Bazar Highway RoW is more than 15m and a 2-lane highway is in place. Considering 4 lanes with median and parking bay on both sides only 12m RoW will be occupied. It is recommended that the rest of the RoW shall house two local roads one on either side of the highway. The advantage of this solution is that the traffic will be able to maintain the same road alignment and that no (or minimal) land acquisition will be required. *Figure 2.1* show the geometric section for such road grouping.



Cross Section of Chittagong-Dhaka Highway



Cross Section of Highway with One Side Primary Road

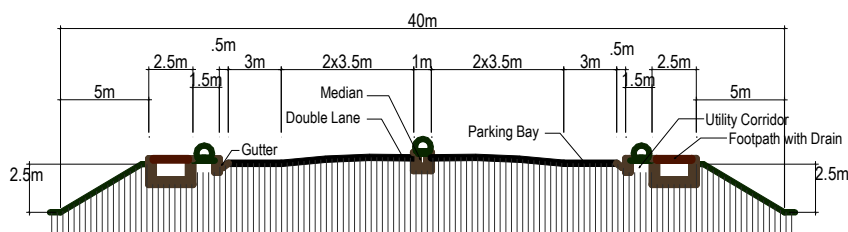
Figure 11.1 Standard Sections of Primary Road

Movement between homogeneous communities is frequent in nature. To ease such movements between communities separated by highway, uninterrupted highway traffic is passed over keeping necessary clearance below for local traffic to pass through at grade. At such points bus bays are proposed beside the highway on both sides equipped with ticket counters and stairs for connecting the levels. Public toilets for both male and female have also suggested. Besides, large areas under the ramp of highway may be used as non-motorized transport / motorized transport stand, police outpost or for any such use.

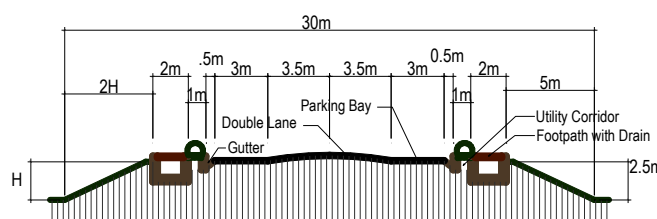
Secondary Road

The next hierarchical roads form a road network connecting local govt. offices, activity nodes of the area and growth centers. As this road system connects important areas of the project area for convenience Consultants called these roads as 'Secondary Road'.

These are the major connectivity roads of the project area passing through agricultural lands and rural settlements, especially linking growth centers. Roadside loading and unloading of bulk produce from the fields to non-motorized and indigenous motorized are expected to be a common scene. Besides, lot of people will carry their produce on head load requiring wider pedestrian path. Standard road sections are provided in *Figure 2.2 and Figure 2.3*.

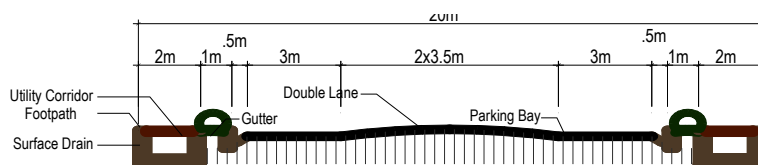


Cross Section of Two Side Primary Road

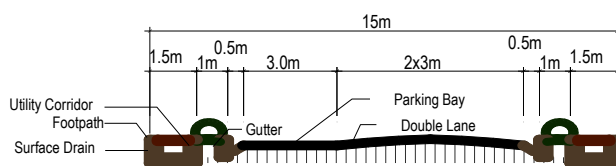


Cross Section of One Side Secondary Road

Figure 11.2 Standard Sections of Secondary Road



Cross Section of Urban Secondary Road



Cross Section of Pourashava Distributor Road

Figure 11.3: Standard Sections of Tertiary Roads

Local Roads/ Tertiary Roads

The Pourashava area has both urban and rural settlements requiring Tertiary roads. 'Urban road' may expect considerable mix of pedestrian, non-motorized transport and motorized transport in its traffic volume to justify standard urban road section. In *Figure 2.4* a set of recommended 'urban local roads' are presented.

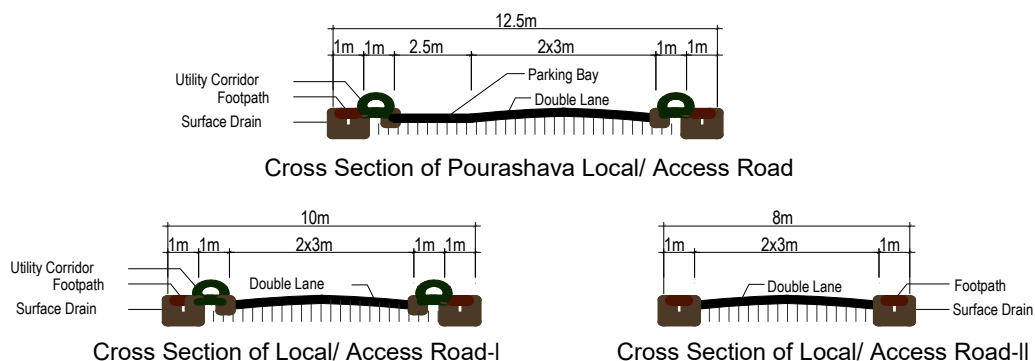


Figure 11.4 Standard Sections of Pourashava Local Roads

11.4.1.2 Proposal for Improvement of the Existing Road Networks

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

Alternative cross-sections for the primary road is –

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

Regardless of which option is required, initially the full 48 meter reserve will be applied, although not necessarily purchased in the first instance, until such time as more detailed site investigations have been undertaken. *Table 2.7* shows the brief of improvement of existing road network development of Chandanaish Pourashava. Detail Inventory of Roads is depicted in *ANNEX-8*.

Table 11.7: Proposal for Improvement of the Existing Road Networks

Type of Road	Road Width (Feet)	Road Widening	
		Length (km)	Area (Acre)
Access Road (as it is)	10	24.8	18.99
Tertiary Road	20	37.02	61.1
	30	12.96	29.58
Secondary Road	40	12.33	40.21
	60	7.74	35
Primary Road	80	9.1	46.88
	160	2.03	24.41
Total		81.18	237.18

Within the established reserve, no further non-road related development will be permitted, with the exception of utility networks. The utilities should not fall under the main carriageways due to the disruption to traffic flows when the system requires repair or maintenance. Localized drainage channels should, where possible, also fall within the road reserve, preferably under the footpath or

hard shoulder to reduce land requirements. If, however, this is not possible an additional reserve to cover the drainage channel will be required, increasing the overall width of the reserve.

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

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

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

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

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

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

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

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

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

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

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

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

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

Functions of the **tertiary road** are:

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

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

No development will be permitted within the 18 meter reserve.

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

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

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

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

11.4.2 Plan for Transportation Facilities

11.4.2.1 Plan for Transportation Facilities

Following are the suggested planning standards (*Table 2.8*) for transport facilities 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.

Table 11.8: Estimation of Land Requirement for Transportation Facilities

Types of Land Uses	Existing		Planning Standard (Acre)
	Unit/No	Land (Acre)	
Bus terminal	-	-	5.07
Truck terminal	-	-	2.54
Baby taxi/tempo stand	-	-	0.25
Rickshaw/van stand	-	-	0.25
Passenger Shed	1	0.01	0.25
Total	1	0.01	8.36

11.4.2.2 Parking and Terminal Facilities

Bus Terminal

There is no bus terminal in Chandanaish pourashava. The area coverage of the proposed bus terminal is 4.09 acres. The location of bus terminal has been proposed in Ward no. 08 and 09 at west side of the Arakan Road.

Truck Terminal

As a small town, the economic activity is very low in Chandanaish Pourashava. The area coverage of the proposed truck terminal is 1.69 acres and it is located in Ward no. 08 and 09 at west side of the Arakan Road. Figure- 2.5 presents a typical bus and truck terminal for Chandanaish pourashava.

Tempo Stand

Tempo is now a major and a cheaper mode of transport in small towns that play important role in commuter transportation. There is no formal tempo stand in Chandanaish. Nine CNG/Autorickshaw stands are proposed with a total of 8.58 acres of land at Ward no. 1, 2, 4, 6 and 9. These terminals may also suitable for the Tempooos (*Map 2.2*).

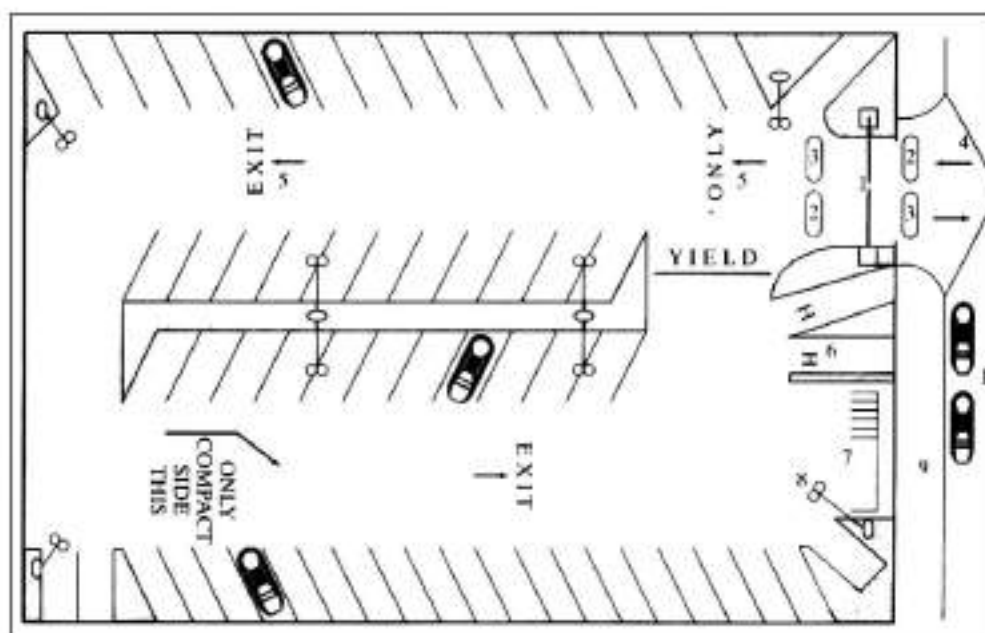


Figure 11.5: Typical Layout of a Bus & Truck Terminal

Auto Rickshaw Stand

There is no formal Rickshaw stand in Chandanaish for keeping the vehicles. Rickshaws generally stand here and there of the pourashava. 1 Auto Rickshaw Stand with an area of 0.6 acres have been proposed in Ward no. 6 (*Map- 2.2*).

Plot wise allocation of different Transport Services has been shown in *Table 1.11, Chapter-1: Land Use Plan, (Part B: Urban Area Plan)*.

Parking Facilities

Parking facilities of Chandanaish Pourashava has been given considering two parameters.

- 1) *Individual Building*: In this context, it is recommended to follow the Building Construction Act, 1996 (Sub-section 2&3, Section-13).
- 2) *Area wise Parking Facilities*: As per Pourashava context, it is recommended to provide parking facilities in Commercial and Industrial area. As per Building Construction Act, 1996, 5.75% land areas will be declared as parking zone.

11.4.2.3 Development of Facilities for Pedestrians, Bicycles and Rickshaws

Footpath

Footpath has been recommended for all the roads (above 20 ft) for safety and ease of pedestrian movement. Due to narrow right of way it is difficult to provide wider footpaths. Width of footpaths will vary between 1.5 m to 2.0 m depending on availability of right of way. For design of footpath, please see *Figure 2.1 to 2.4*.

Bicycles and Rickshaws

Separate lane for NMT vehicles will be provided in Transport network development plan which will be used by bicycle and rickshaw. Separate Service lane can be initiated when average NMV is > 400 per hour and MV is > 100 per hour as per projected traffic volume.

11.4.2.4 Other Transportation Facilities

Improvement Roadway Intersection

Due to the poor designing of road way intersection, traffic congestion and traffic conflict occur in the Pourashava.

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

- Channelization
- Improvement of Intersection geometry

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 excessive pavement areas (due to roundabout and islands)

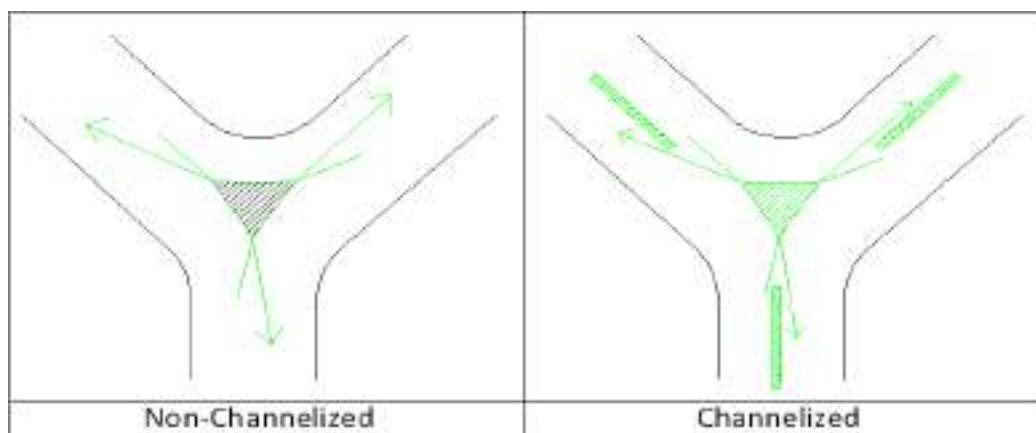


Figure 11.6 A: Channelization Measures at maior intersections

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.

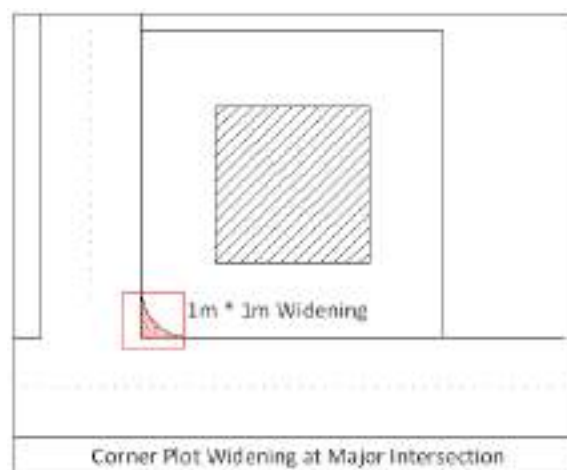


Figure 11.6B: Corner Plot Widening at intersections

11.5 Transportation System Management Strategy (TSM)

11.5.1 Strategies for Facility Operations

Parking Management

Parking management concerns provision and controlled utilization of limited parking space through physical means and regulatory measures. In Chandanaish Pourashava, parking measures are considered for:

- Bus Stand
- 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°
 - Within 25 meter of Pedestrian Crossing or Intersection, no parking would be allowed
 - No parking will be allowed over the Highway

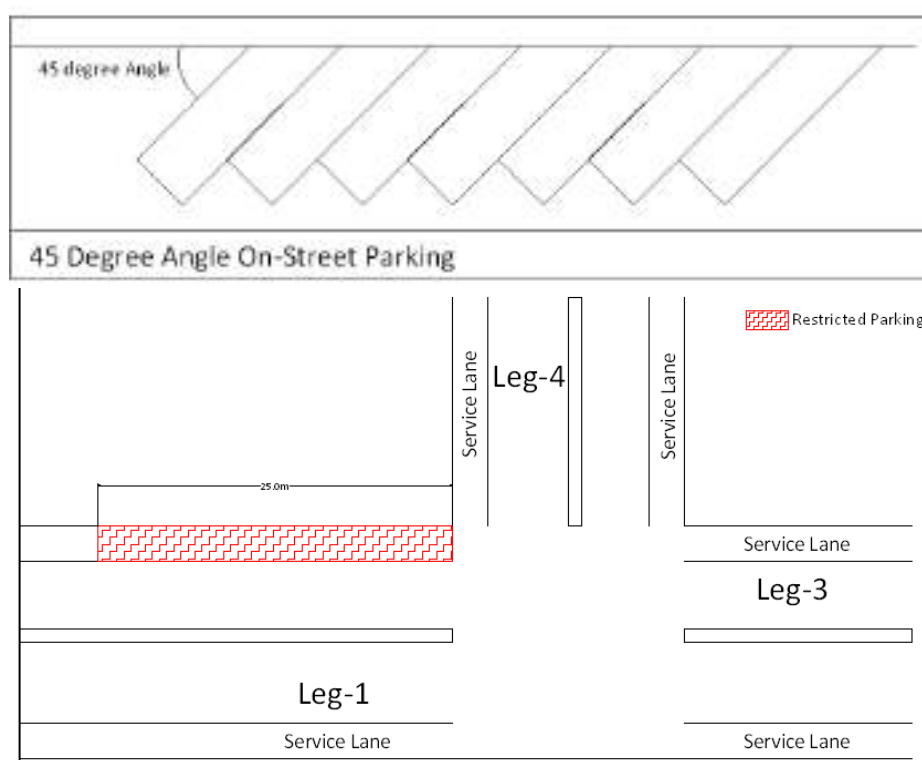


Figure 11.7: Parking Management

11.5.2 Strategies for Traffic Flow and Safety

Restriction on Particular Mode (s) (for an area or a road)

- a. For certain time period of the day; (Truck movement) or
- b. For all time (Rickshaw ban)

In Chandanaish Pourashava, Truck movement will be restricted to move through the main cities. The Trucks or other heavy traffic will use the Highway Road (Arakan Road). On the other hand, Rickshaw and other non-motorized vehicles will be discouraged to move over the Regional Highway (Chandanaish- Satkania Road) and other Upazila/Feeder Roads. Though, provision of Service lane in these roads is kept as per National Land Transport Policy, 2004. It is preferable to ensure safety by providing separate service lane, shoulder and footway.

Road Signs and Markings

These are the most common form of management measures for controlling of traffic movement and improving safety of operation. Marking includes lane marking, location of lane changes, guiding turning traffic etc. The basic function of markings by road paint measures is to inform the driver or to guide into the correct lane for the movement, wants to make.

Linked traffic Signals

Traffic signals in an areas or on a particular road can be linked together to reduce delays at the intersections. Depending on situation, this measure can bring significant improvement in traffic operation. In Chandanaish Pourashava, the signal system would not be applicable within plan period. However, the provision of signal system is proposed for 3 Leg and 4 Leg Intersections.

Speed Control

Regulatory or various physical measures like Speed breaker, Rumble strip etc. can be used. In Chandanaish Pourashava, Highway Road, at the link of Primary and Secondary Road, at major Intersections, at in front of schools, colleges, Mosques, Temples Speed Control measures should be taken. In Highway Road the speed have to be controlled within 80-90 km per hour. Besides, speed breaker should be provided at the in-front school, colleges and hospitals etc.

11.5.3 Strategies for Traffic Management

Road Hierarchy measures

Hierarchy is categorization of roads according to their function which has been already described in previous section.

Segregation of different Modes

Segregation of Right of Way by speed and purpose (NMTs from MTs by physical means or otherwise, providing separate frontage or Service Road) is one type of segregation which can be utilized for traffic management.

Pedestrian/ Non-motorized measures

Provision of walk-ways, improvement of footpaths, segregation from vehicular traffic, closing of streets to vehicular traffic etc. are some of the important measures.

Tidal flow operation

It refers to the management process whereby the carriageway area is shared between the two directions of travel (by movable barriers) in near proportion to the flow in each direction. As a result, number of lanes assigned to a particular direction varies with the time of the day. 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. This phenomenon is known as Tidal Flow. In this case, half of other side lane can be utilized for one direction traffic during peak hour.

11.6 Plan Implementation Strategies

11.6.1 Regulations to implement the Transportation Plan

In Bangladesh, it is a common phenomenon that the Plan proposal is just a policy document, lack of implementation is observed in all sectors. Transport sector is also familiar with this phenomenon. Roads are developed without considering laws and Regulations especially internal roads of the town. The violation of laws has been commenced from the micro level Building Plan Approval. Therefore, in implementation of Transportation Plan, it is required to follow the relevant rules and policies. Building Plan Approval Building Construction Rule, 1996, Bangladesh National Building Code, 1993 (amended in 2006), National Land Transport Policy (2004) which has been already explained in different design phase of preparation of Master Plan of Chandanaish Pourashava. Besides, to develop the Road Network it is required to acquire the land as per requirement of Right of Way (ROW). The issues regarding acquisition of Land is also mentioned in National Land Transport Policy, 2004.

Land Acquisition as a Legal Instrument for Construction of Roads

Land acquisition is a process in which a public agency or non-profit land conservation organization purchases all the ownership rights vested to the land from a willing seller. In every case, land acquisition must mean the transfer of ownership. Thus, it is the act by which a person acquires a property.

Land Acquisition Act

For implementation of any urban development program, availability of land and its control are necessary. Acquisition of land for creating an adequate stock of urban land is necessary not only for future growth but also for a large number of public uses. One of the most important legal tools is to acquire the land by the Land Acquisition Act, 1894 was subsequently amended in 1961. The right of acquiring land by the country for the public utility has been recognized all over the world. The basic Principle of this Act is that is to give priority to the welfare of the community and provide compensation to the owner for the loss of property rests with the state to be settled. To provide the advantage of Land Requisition, the Land Acquisition and Requisition of Immovable Property Ordinance, 1982 has been come into force. Table 2.6.1 shows the possible regulations to implement the Transportation Plan of Chandanaish Pourashava.

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

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

Table 11.9: Regulations to implement Transportation Plan

Type of Development	Nature of Planning	Policy instrument to control development	
Obtaining individual plots under planning	<ul style="list-style-type: none"> Building Adjacent Road Preventing illegal Encroachment of Road 	Follow up the Section-8-12 including clauses of Building Construction Act, 1996 Implementation Agency: Pourashava, AC land Office	
Planned development of undeveloped areas	New Roads and walkways	Compulsory Acquisition of land	Involvement of Implementation Agency LGED and RHD for Regional and National Road network
Redevelopment of already developed areas	Road Widening	Land Sharing/ Readjustment	Respective Authority: RHD, LGED, and Pourashava.
Other Measures	<ul style="list-style-type: none"> Parking Measures Bus Stoppage Street Lighting Tree Plantation Traffic Control Channelization Infrastructure development such as Bridge 	<ul style="list-style-type: none"> ✓ Compulsory land Acquisition for tree plantation and other measures will be implemented by Pourashava. ✓ RHD and LGED will be involved to construct Bridges and Channelization. ✓ Traffic Control by Traffic Police 	

11.6.2 Implementation, monitoring, Evaluation and Coordination of the Plan

Once the decisions are made, procedures for implementing the chosen policies and programs begin. The term 'implementation' embraces such a multitude of varied activities that there is no one technique, or even group of them to ensure the effective implementation. The implementation of any plan can not be possible within a day. It is a process and requires proper monitoring, co-ordination among the responsible Organizations. To implement the Transportation and Traffic Management Plan of Chandanaish Pourashava, following system is required to be developed:

Co-ordination among organizations and link with Pourashava

Pourashava: Pourashava is the highest authority for implementing the Master Plan as per Pourashava Act, 2009. The Master plan must coherent with the existing rules and regulations of Pourashava. Pourashava will be responsible for:

1. Any new roads construction and maintenance
2. Development, expansion and improvement of any road infrastructure
3. Without permission of Pourashava no development activities can be conducted

Besides, any site development schemes, Community Development projects, land acquisition, Building Control, Parking Management, Parks, Traffic Control and other basic urban services (such as street lighting) are provided by Pourashava.

Other Development Organizations responsible for implementation

BRTA: BRTA is a regulatory body to control, manage and ensure discipline in the road transport sector and road safety related areas in Bangladesh. The function of BRTA is oriented with Vehicle Registration, Route Permit etc. Depending on forecasted travel demand BRTA will be responsible for motorized vehicle registration.

BRTC: The function of BRTC is oriented with Comfortable and safe Travel, Subsidies for different group of passengers such as Students, Old persons etc. Thus, to ensure efficient service for the passengers is the main focus of this Organization.

LGED: An Engineering Cell was established in the Local Government Division (LGD) under the Ministry of Local Government, Rural Development and Cooperative (MLGRD&C) in 1970s to oversee the rural works program. LGED is responsible for Upazila, Union and Village Road, Bridges Construction and maintenance. Thus, such roads and other infrastructure connecting Pourashava are constructed by LGED.

RHD: The Roads and Highways Department (RHD) was created in 1962. RHD is responsible for the construction and the maintenance of the major road and bridge network of Bangladesh. RHD is mainly responsible for Construction of National, Regional and Zila/ Feeder Roads of Bangladesh.

Land Registration Department: In 1989, Land Record and Survey Management Evaluation Committee recommended that at the Zila level, Zila Land Officer, Additional Zila Land Officer, Additional Zila commissioner and Assistant Commissioner (Land) will form Land Registration Committee which will be 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.

Computerized Land Information System

An efficient system for land administration and geographic information is an important tool for planned development and economic wellbeing for Pourashava. This system can provide information on real property rights, values and use of land, building for business activities, management of real properties and development and implementation of land and Transport policies. At present, the system of land recording is traditional handwriting documentation suffering with the problem of storing, retrieving and analyzing. Therefore, advantages will be occurred in some specific issues are as follows:

- Land Tenure (land ownership)
- Land Value
- Information on “*khas*” land
- Existing Land use intensification and Road Network Map
- Information on unauthorized and non-conforming land uses

Thus, the digital database for lands within Pourashava has been already built up which will ultimately build up the connection among all responsible organizations with Pourashava. The development of corridors, densification and infilling, and transport planning must guide land use and development planning, and vice versa.

Monitoring

For the efficient implementation, proper and up to date land records are prerequisite. Success of town planning schemes, land readjustment and transfer of development rights depend upon efficacy of land records – Revenue Mouza maps, Physical Feature Maps, Land Use Maps, Transportation Network Maps. Regular monitoring and supervising is the vital step in planning process after the preparation of plan phase.

According to Urban Management Policy, 1999, Land use plans shall be prepared by Pourashavas 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 Pourashava 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. In Chandanaish Pourashava, at present a Town Planner is working which is one of the implications of this policy in practical field of planning.

In light of this policy, it would be prudent to initiate improvement and coordination in the databases of existing agencies. The maintenance of land records is the statutory responsibility of the A.C Land Office (Settlement Office). This also forms the basis of land taxation. The responsibility of granting development permission or building plan approval is with the Pourashava where Development Plans or Proposals are prepared. The local authority (Pourashava) has to use same data base for assessment of properties for property tax. Besides, other government agencies (LGED, RHD etc.) should use the same database. It is therefore necessary to establish interactive data bases - Revenue and developmental - with the concerned agencies. In this regards, Geographic Information System (GIS) is the most applicable tool which can assist the continuous updating of database and enhance the Land management system of the Pourashava.

Evaluation

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

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

The top level supervision has to be done by a high level supervisory committee headed by the Pourashava 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 Pourashava. The committee will supervise implementation works regularly and issue necessary instructions to expedite the works of implementation.

Chapter 12: Drainage and Environmental Management Plan

A: Drainage Plan

12.1 Introduction

12.1.1 Goals and Objectives

Due to population increase, open spaces and low-lying areas within the settlements, new residence was developed to accommodate additional inhabitants. This is greatly reduced the retention areas for runoff during rainy season, consequently adversely affected the drainage system. On the other hand encroachment on the natural canals and unplanned construction of roads for access to individual plots is impeding the rainfall run-off to discharge in the nearby rivers/outfall. Temporary rise in the water level result in the inundation of vast areas are causing sufferings to the inhabitants of those areas.

Water supply, sanitation, solid waste management, cyclonic storm, flooding, air, sound and health hazards are the prime concern for improving the environment and safe living condition of the study area.

The aim of the drainage and environmental study is to improve the general drainage and environment in the Chandanaish Pourashava and surrounding area and keep the parameters up to the tolerable limit of the human health and ecosystem.

12.1.2 Methodology and Approach to Planning

There is no any standard method or techniques to projection of drains for maintaining proper drainage system. It depends on the several parameters. Inadequate drainage networks, natural siltation, absence of outlets, disposal of solid waste into the drains and drainage path and lack of proper maintenance of the existing drainage system are the major causes of drainage problems and water logging in the project area. Apart from these, seasonal tidal effect and flat topography of land also causes temporary water logging in the project area.

As short-term measure the congestions artificially created in the drainage channels have to be removed. But for long-term measure regional and national level intervention is urgently needed. A national policy on mitigation of water logging has to be adopted and implemented on priority basis for the mitigation of the waterlogging problem of this region.

12.2 Existing Drainage Network

12.2.1 Introduction

The drainage system of Chandanaish Pourashava includes various types of drains. Primary drains are mainly based on pre-existing natural khals. Secondary drains discharging into the primaries may be natural or man-made. Tertiary channels have usually debris and waste.

12.2.2 Existing Drainage System/ Network

Natural Drain

The Pourashava comprise a significant number of ponds and ditches. Two canals named Chullo khal and Boromoti Khal comprising of 11.25 km long is only the natural drainage. Its condition is very poor due to encroachment by construction of houses. Area covered by Khals found to be 496.94 acres in the project area (*Table 3.1*).

Table 12.1: List of Existing Natural Drainage Network

Khal ID	Length (km)	Area (acre)
C-1	2.38	6.40
C-2	0.02	0.03
C-3	0.31	0.72
C-4	0.27	0.38
C-5	1.16	1.72
R-1	1.80	29.03
R-2	5.31	458.66
Total	11.25	496.94

Source: Physical Feature Survey, 2009

The Pourashava comprise a significant number of ponds and ditches. In Chandanaish Pourashava 1706 number of pond and only 15 ditches exist. Pond and ditches covers 398.54 acres of land. Highest number of ponds is observed in ward 5 comprising 82.45 acres of land i.e 20.69 percent of the total land occupied by ponds and ditches.

Number of Ponds: 1706

Number of ditches: 15

Man Made Drain

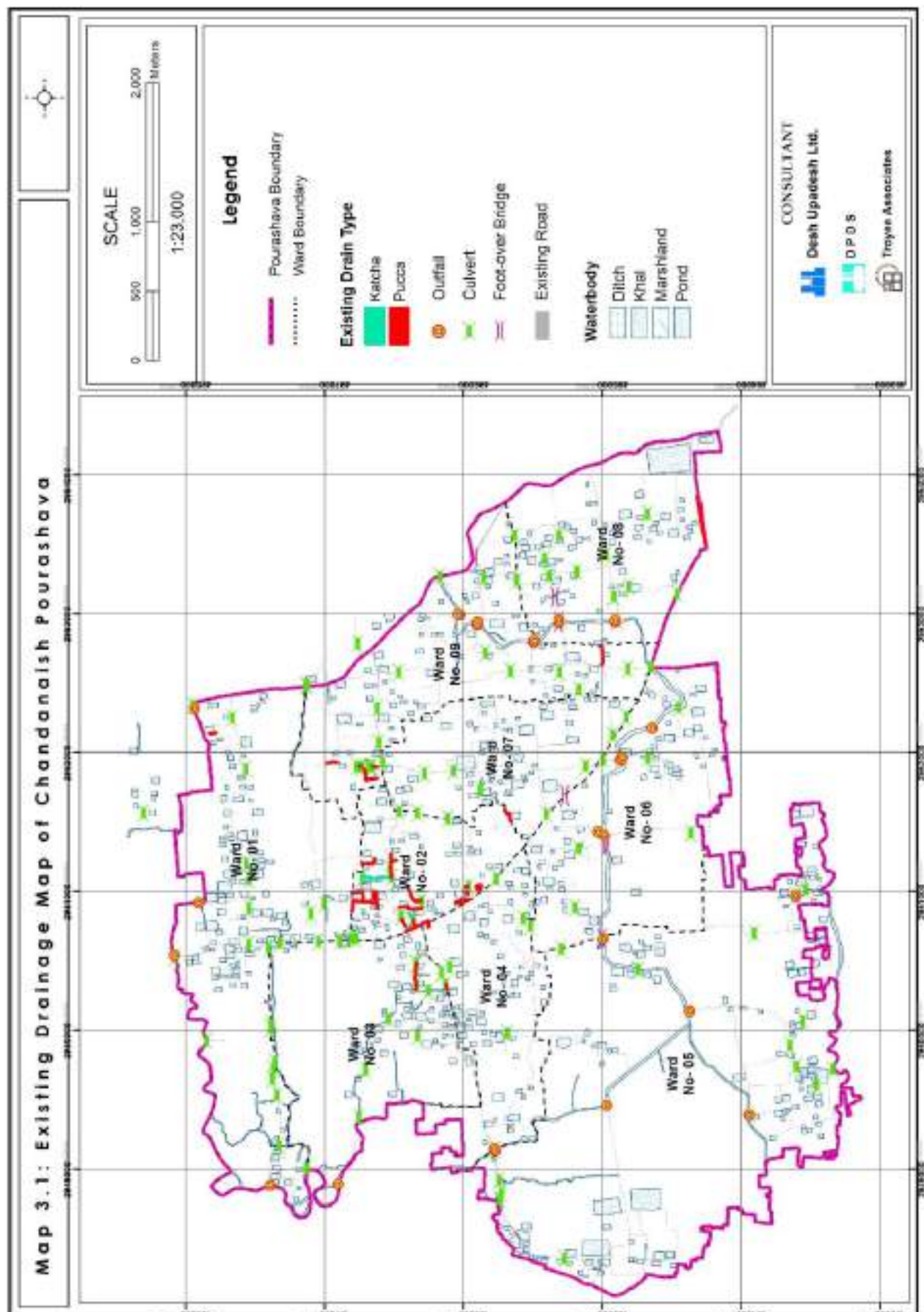
There is only 3.49 km drainage network in the municipal area of Chandanaish Pourashava. Among the total drain 3.24 km is pucca and only 0.25 km drain is katcha. All the total katcha drain is found in ward 02 (Table 3.2). The existing drains in Pourashava area fall into the nearby khal or low land of the Pourashava. As a result some of areas are facing the water logging problem during rainy season. The Pourashava comprise a significant number of ponds. These ponds are also act as drainage system of the project area. The detail networks of drain of Pourashava area are presented in Map 3.1. There is no storm water drainage system in Pourashava area. The existing drainage facilities in the Pourashava areas are inadequate.

Table 12.2: Man-made Drainage Network of Chandanaish Pourashava

Drain ID	Drain Type	Hierarchy of Drain	Length (km)
T-DR-EX-01	Pucca	Tertiary Drain	0.02
T-DR-EX-02	Pucca	Tertiary Drain	0.14
T-DR-EX-03	Pucca	Tertiary Drain	0.08
T-DR-EX-04	Pucca	Tertiary Drain	0.12
T-DR-EX-05	Pucca	Tertiary Drain	0.14
T-DR-EX-06	Pucca	Tertiary Drain	0.20
T-DR-EX-07	Pucca	Tertiary Drain	0.12
T-DR-EX-08	Pucca	Tertiary Drain	0.04
T-DR-EX-09	Pucca	Tertiary Drain	0.16
T-DR-EX-10	Pucca	Tertiary Drain	0.18
T-DR-EX-11	Katcha	Tertiary Drain	0.21
T-DR-EX-12	Pucca	Tertiary Drain	0.20
T-DR-EX-13	Pucca	Tertiary Drain	0.19
T-DR-EX-14	Pucca	Tertiary Drain	0.17
T-DR-EX-15	Katcha	Tertiary Drain	0.04
T-DR-EX-16	Pucca	Tertiary Drain	0.16
T-DR-EX-17	Pucca	Tertiary Drain	0.04
T-DR-EX-18	Pucca	Tertiary Drain	0.02
T-DR-EX-19	Pucca	Tertiary Drain	0.16
T-DR-EX-20	Pucca	Tertiary Drain	0.04
T-DR-EX-21	Pucca	Tertiary Drain	0.05
T-DR-EX-22	Pucca	Tertiary Drain	0.10
T-DR-EX-23	Pucca	Tertiary Drain	0.15
T-DR-EX-24	Pucca	Tertiary Drain	0.27
T-DR-EX-25	Pucca	Tertiary Drain	0.06

Drain ID	Drain Type	Hierarchy of Drain	Length (km)
T-DR-EX-26	Pucca	Tertiary Drain	0.05
T-DR-EX-27	Pucca	Tertiary Drain	0.09
T-DR-EX-28	Pucca	Tertiary Drain	0.10
T-DR-EX-29	Pucca	Tertiary Drain	0.01
T-DR-EX-30	Pucca	Tertiary Drain	0.08
T-DR-EX-31	Pucca	Tertiary Drain	0.02
T-DR-EX-32	Pucca	Tertiary Drain	0.03
T-DR-EX-33	Pucca	Tertiary Drain	0.04
Total			3.49

Source: Physical Feature Survey, 2009



12.2.3 Analysis on Land Level Topographic contour

The study area is mainly medium highland excepting some low lying strips and canals. A small part of it is urban, sign of very slow urbanization process is visible in few isolated locations and generally it is an agricultural area characterized by crop production. Alignment and crest level survey has conducted to measure the elevation of the existing road network, khal, drainage channel (no embankment or dyke has found).

Through topographic survey land level/spot heights were taken at 50m intervals. By this time 2465 numbers of spot heights were taken within the Pourashava. The contour map prepared through land level survey shows; nearly 100% of the study area has an average RL of 3.78 m. These areas are free from normal flooding. Only minor water logging occurred during the rainy season that does not stay for long.

The lowest spot height is -0.6 mPWD (Ward No. 3) and the highest spot height is +11.7 mPWD (Ward No. 9) are found in the study area. Average land height of the project area is + 3.78 mPWD. About 41% spots are found ranges between + 2.1 mPWD to + 4 mPWD The number of spots covered in each ward with minimum height, maximum height, average height and their standard deviation is shown in *Table 3.3*.

Topography of different wards of Chandanaish Pourashava is almost neared or below mean elevation. In this connection ward no. 7, 8, 9 are having higher elevation. Maximum areas of these wards have remained equal to their mean spot level.

Table 12.3: Spot height (in Meter) in the Chandanaish Pourashava

Ward No.	Count	Minimum	Maximum	Mean	Standard
Ward 1	429	-0.3	8.1	2.67	1.66
Ward 2	109	0.3	5.7	3.55	1.13
Ward 3	341	-0.6	4.2	1.99	0.99
Ward 4	265	0.3	4.8	2.32	0.99
Ward 5	532	0.3	5.4	2.28	1.02
Ward 6	200	0.6	6.3	3.59	1.43
Ward 7	113	3	6.6	4.9	0.74
Ward 8	182	3	9.3	6.44	1.19
Ward 9	294	2.4	11.7	6.25	1.93
Total	2465	-0.6	11.7	3.78	1.23

Source: Topographic Survey, 2009

The contour map prepared through land level survey shows; nearly 100% of the study area has an average RL of 3.78 m. These areas are free from normal flooding. Only minor water logging occurred during the rainy season that does not stay for longer time

A contour map for Chandanaish Pourashava at 0.30m vertical interval was drawn using the spot levels surveyed roughly at 50m interval. Summary result of contours generated is presented in *Table 3.4 and 3.5*. It was observed that maximum parts of total area are on the average height elevation. Main activities of the Pourashava are concentrated at the east part of higher elevation. Detailed contour map of Chandanaish Pourashava area is presented as *Map 3.2*.

Table 12.4: Percent Distribution of Spot Level according to the Defined Height Interval

Spot Interval m PWD	Spot Number (Frequency)	Percentage
Up to 1.2	252	10.2
1.21 to 2	438	17.8
2.1 to 4	1017	41.3
4.1 to 6	468	19.0
6+	290	11.8
Total	2465	100

Source: Topographic Survey, 2009

Table 12.5: Contour derived from the spot elevation

Sl. No.	Spot Unit	Value
1	Total Contour Number	Count: 2465
2	Mean (Meter)	Mean: 3.36
3	Maximum Contour Height (Meter)	Maximum: 11.7
4	Minimum Contour Height (Meter)	Minimum: -0.6
5	Standard Deviation	Standard Deviation: 2.10

Source: Topographic Survey, 2009

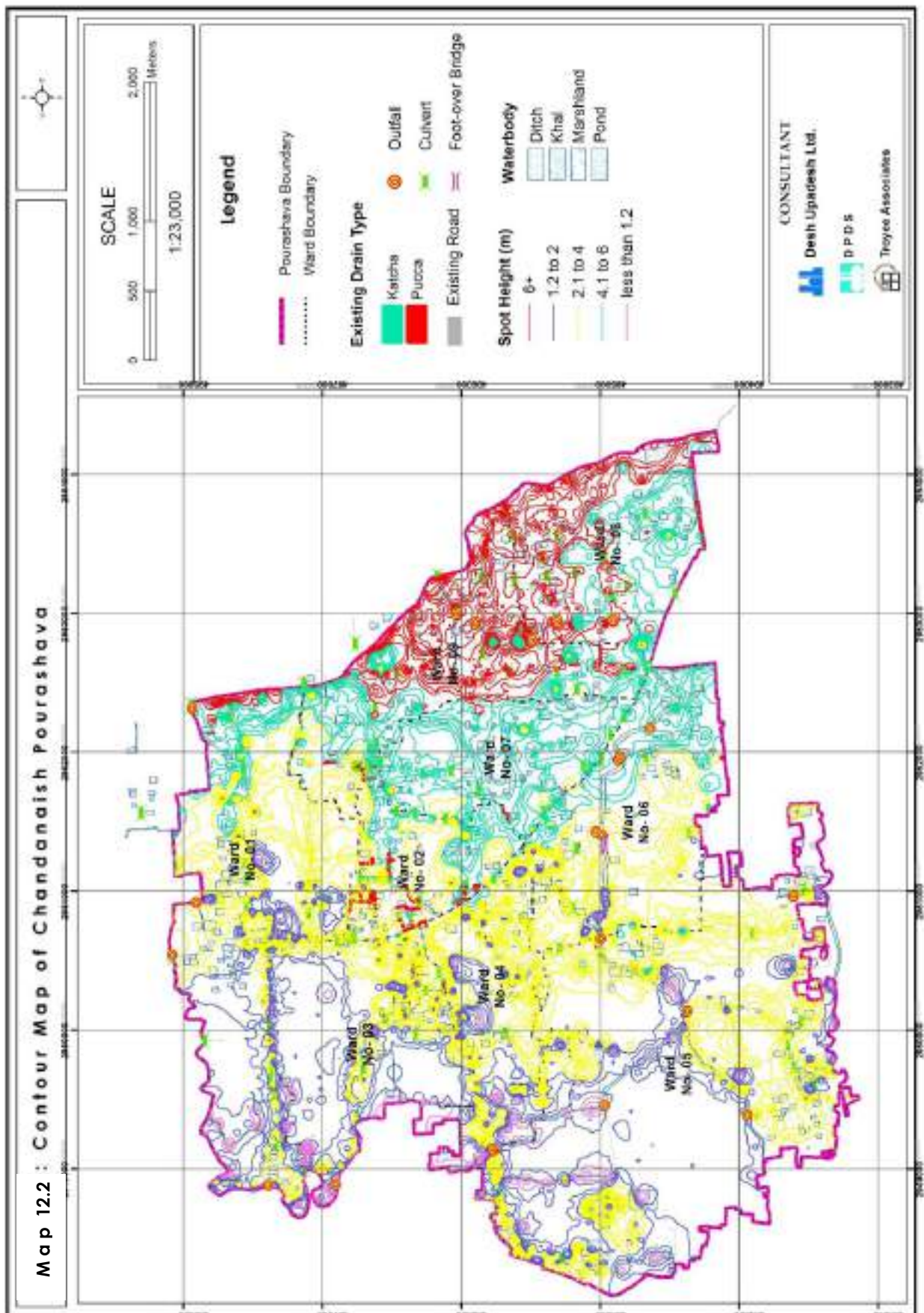
12.2.4 Analysis of peak hour run-off discharge and identification of drainage outfalls

The run-off co-efficient C is defined as the ratio of the rate of run-off to the rate of rainfall during the same time period and is dimensionless. Because, some rainfall is retained in depression or ponds and the run-off is prevented from reaching the drain due to obstructions, or infiltrate into the soil, the run-off coefficient is less than one.

The value applied is based upon an average for the situation under consideration and is recommended that to be sent in the range of 0.40 to 0.48 for fully developed urban areas containing a normal mix of residential and commercial properties.

There are several problems were identified pointed as following manner:

- Uncontrolled conversion of low lying areas to urban land through landfill
- Encroachments of natural canals
- Absence of effective surface drain system
- Uncontrolled and indiscriminate disposal of solid waste into khals and drains
- Lack of proper operation and maintenance of drainage system
- Lack of awareness of people about the need and function of drainage system



12.3 Plan for Drainage Management and Flood Control

12.3.1 Plan for Drain Network Development

Smooth natural flow and proper maintenance of drainage system are pre-requisite to solution of water logging. Ward action plan would be addressed more to mitigate the overall drainage situation in the study area. Beside this, encroached settlements and other uses within the water bodies recommend to remove immediately. Excavation of existing water bodies and canal can be made quick drain the runoff and increase the water retention capacity.

12.3.1.1 Drainage Network Plan

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

Primary Drain

Primary drains are called as the main drains. Primary drains cover larger storm drainage area than above discussed tertiary and secondary drains. In ascending order its position is third. Its cross-section is larger than other types, carrying capacity is high and is constructed of brick, cement concrete and sometimes reinforced concrete. Primary drains may be of earthen structure provided sufficient land is available and land value is low. Contributing drainage water comes from tertiary and secondary drains. Primary drains discharge its drainage water to outfall, natural khal, river or large lowland area/ Beels. Figure 3.1 and 3.2 below show the typical cross-section of the primary drains.

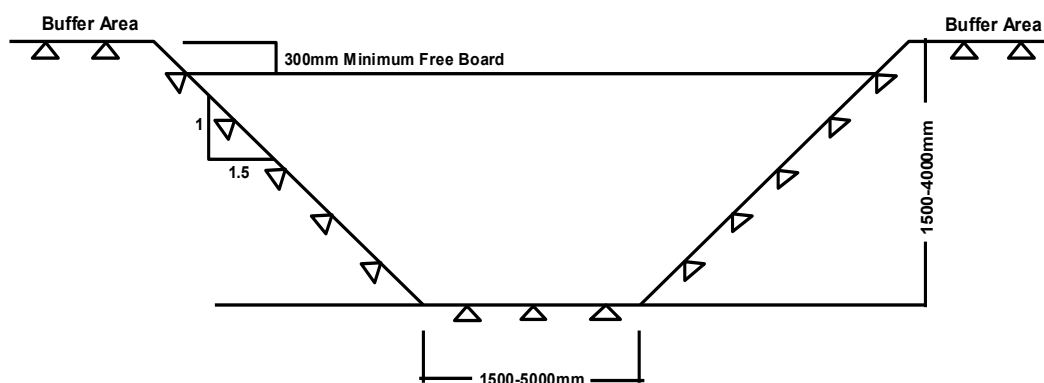


Figure 12.1: Earthen Primary Drain

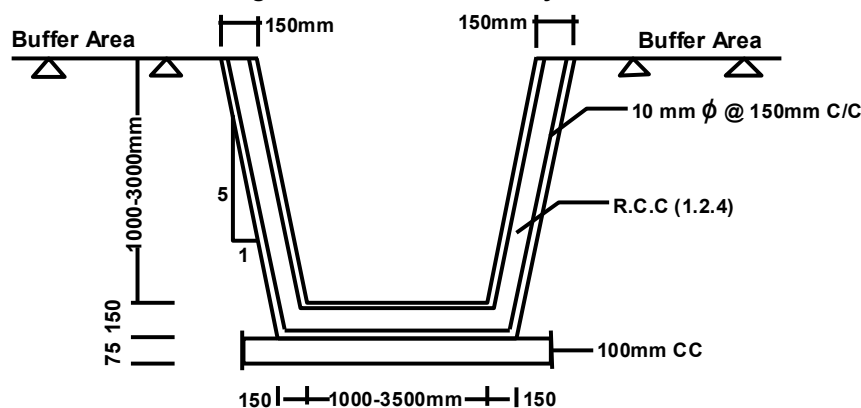


Figure 12.2: Typical RCC Primary Drain

Secondary Drain

Secondary drains collect discharge from tertiary drains. One secondary drain may receive drainage discharges from several tertiary drains in its course. Size and capacity of secondary drain is much bigger than tertiary drains, its catchment area is also bigger than tertiary drains. Like tertiary drains, it may run parallel to bigger roads. Secondary drains may run along and through the middle of its storm water contributing area. The typical cross-section, size and shape, and its construction material are shown in Figure 3.3

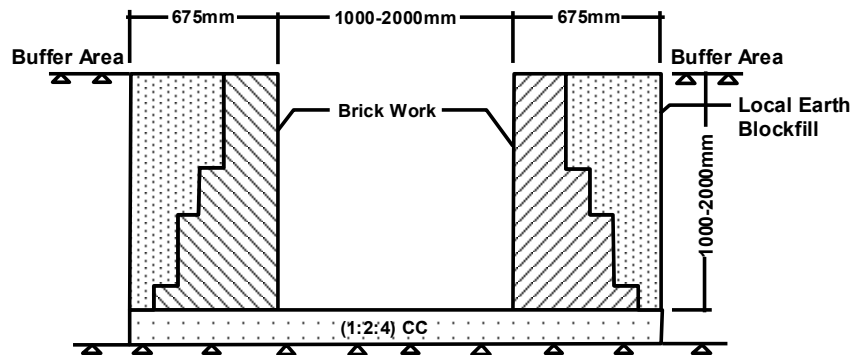


Figure 12.3: A Typical Secondary Drain

Tertiary Drain

Tertiary drain carry run-off or storm water received from the above mentioned plot drains and block or 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 3.4.

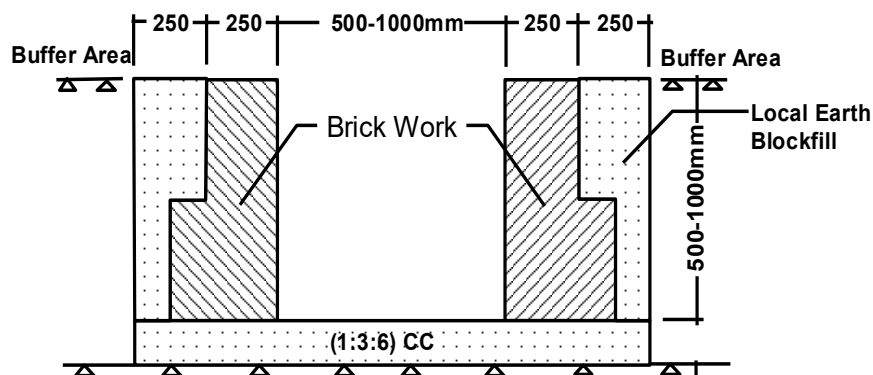


Figure 12.4: A Typical Tertiary Drain

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

Plot Drains

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

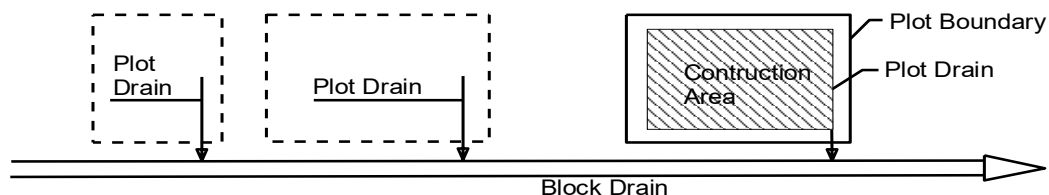


Figure 12.5: Plot and Block Drain

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.

A schematic diagram showing the origin of Primary, Secondary and Tertiary drains and their destinations to the outfall river is presented in Figure 3.6.

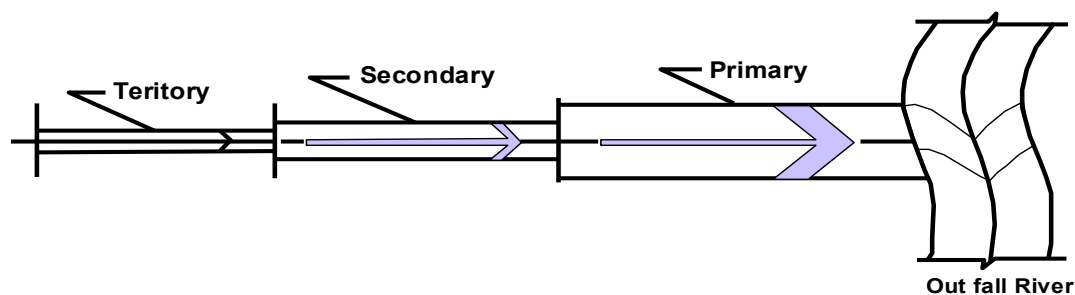


Figure 12.6: A Schematic Diagram showing flow directions from Tertiary drains to Outfall

Other Drainage Related Infrastructures

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

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

i) Bridges, Culverts and Box Culverts

These structures are provided at places wherever roads cross the drainage network system. Such structures are built on the roads to free passage of drainage water and sometimes to provide navigation/ boat passages. Consequently the conflict between drainage and road networks is mitigated. Figure 3.7 and 3.8 show bridge and culverts in such system.

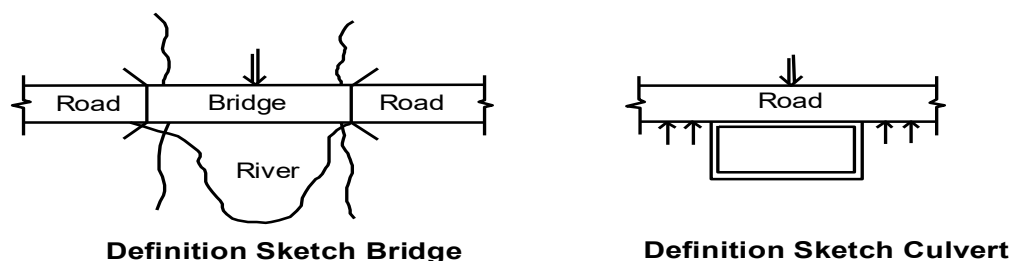


Figure 12.7: Bridge and Culvert

ii) Drainage sluices, pipe sluices and siphons

Drainage sluices, pipe sluices and siphons are provided on the embankments. Embankments protect the area from floods coming from outside rivers and make the project area flood free. However storm water from rainfall-runoff within the area causes localized flood, drainage congestion and submergence. A sketch below shows a few of such structures.

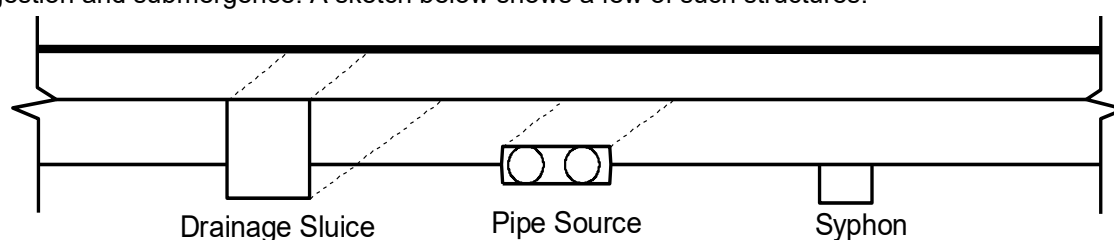


Figure 12.8: A schematic view of Drainage sluice, pipe sluice and siphon on embankment which relieve drainage congestion.

12.3.1.2 Proposal for improvement of the existing drains networks

Drainage of the Chandanaish Pourashava is served by a canal system. The canal system is not functioning. Most of the canals have been dried up due to siltation and blockade by encroachment. Proposal has been made in the plan to re-excavate the canals and create a canal network through connecting the missing links for improvement of the drainage system. Bridge and culverts should be constructed in appropriate location of the canals, so that flash flood water can be drained quickly.

12.3.1.3 Proposals for New Drains

There are three types drain proposed in the drain network plan, primary drain, secondary drain & tertiary drain. Total 83.27 km new drains have been proposed for the planning area of Chandanaish Pourashava (Table 3.6, 3.7 and 3.8 & Map 3.3).

Tertiary Drain

Tertiary drains are local drains. Tertiary drains cover smaller storm drainage area than primary and secondary drains. In ascending order its position is third. Its cross-section is smaller than other types; carrying capacity is low and is constructed of brick, cement concrete and sometimes reinforced concrete. Tertiary drains runs along all local secondary/access roads. The total length of new tertiary drains is 41.87 km. Table 3.6 shows the details of new tertiary drains.

Table 12.6: Proposals of New Tertiary Drains in Chandanaish Pourashava

Drain ID	Drain Type	Length in Meter	Width in Meter	Phasing
TD-1	Tertiary Drain	274.8	0.50	Phase-02
TD-2	Tertiary Drain	23.6	0.50	Phase-02
TD-3	Tertiary Drain	298.4	0.50	Phase-02
TD-4	Tertiary Drain	140.1	0.50	Phase-02
TD-5	Tertiary Drain	203.8	0.50	Phase-02
TD-6	Tertiary Drain	519.1	0.50	Phase-02
TD-7	Tertiary Drain	102.8	0.50	Phase-02
TD-9	Tertiary Drain	735.8	0.50	Phase-02
TD-10	Tertiary Drain	600.0	0.50	Phase-02
TD-11	Tertiary Drain	754.2	0.50	Phase-02
TD-12	Tertiary Drain	229.9	0.50	Phase-02
TD-13	Tertiary Drain	188.3	0.50	Phase-02
TD-14	Tertiary Drain	691.0	0.50	Phase-02
TD-15	Tertiary Drain	325.6	0.50	Phase-02
TD-16	Tertiary Drain	418.5	0.50	Phase-02
TD-17	Tertiary Drain	136.7	0.50	Phase-02
TD-18	Tertiary Drain	200.6	0.50	Phase-02
TD-19	Tertiary Drain	335.6	0.50	Phase-02
TD-21	Tertiary Drain	193.7	0.50	Phase-02
TD-22	Tertiary Drain	322.9	0.50	Phase-02
TD-23	Tertiary Drain	138.0	0.50	Phase-02
TD-24	Tertiary Drain	309.8	0.50	Phase-02
TD-25	Tertiary Drain	336.9	0.50	Phase-02
TD-26	Tertiary Drain	451.2	0.50	Phase-02
TD-27	Tertiary Drain	304.7	0.50	Phase-02
TD-28	Tertiary Drain	462.6	0.50	Phase-02
TD-29	Tertiary Drain	147.6	0.50	Phase-02
TD-30	Tertiary Drain	642.6	0.50	Phase-02
TD-31	Tertiary Drain	338.4	0.50	Phase-02
TD-32	Tertiary Drain	551.4	0.50	Phase-02
TD-33	Tertiary Drain	236.6	0.50	Phase-02
TD-34	Tertiary Drain	308.9	0.50	Phase-02
TD-35	Tertiary Drain	336.7	0.50	Phase-02
TD-36	Tertiary Drain	396.7	0.50	Phase-02
TD-37	Tertiary Drain	248.0	0.50	Phase-02
TD-38	Tertiary Drain	151.7	0.50	Phase-02
TD-39	Tertiary Drain	580.9	0.50	Phase-02
TD-44	Tertiary Drain	252.1	0.50	Phase-02
TD-45	Tertiary Drain	1285.4	0.50	Phase-02
TD-46	Tertiary Drain	365.7	0.50	Phase-02
TD-47	Tertiary Drain	291.5	0.50	Phase-02
TD-48	Tertiary Drain	940.0	0.50	Phase-02
TD-49	Tertiary Drain	263.9	0.50	Phase-02
TD-50	Tertiary Drain	234.5	0.50	Phase-02
TD-51	Tertiary Drain	725.7	0.50	Phase-02
TD-52	Tertiary Drain	158.4	0.50	Phase-02
TD-53	Tertiary Drain	410.1	0.50	Phase-02
TD-54	Tertiary Drain	163.4	0.50	Phase-02
TD-55	Tertiary Drain	588.3	0.50	Phase-02
TD-56	Tertiary Drain	537.3	0.50	Phase-02
TD-57	Tertiary Drain	582.1	0.50	Phase-02
TD-58	Tertiary Drain	880.4	0.50	Phase-02
TD-59	Tertiary Drain	167.8	0.50	Phase-02
TD-60	Tertiary Drain	996.0	0.50	Phase-02
TD-61	Tertiary Drain	393.7	0.50	Phase-02
TD-62	Tertiary Drain	327.9	0.50	Phase-02
TD-63	Tertiary Drain	437.8	0.50	Phase-02
TD-64	Tertiary Drain	543.4	0.50	Phase-02
TD-65	Tertiary Drain	208.7	0.50	Phase-02
TD-66	Tertiary Drain	522.7	0.50	Phase-02
TD-67	Tertiary Drain	297.2	0.50	Phase-02

Drain ID	Drain Type	Length in Meter	Width in Meter	Phasing
TD-68	Tertiary Drain	275.6	0.50	Phase-02
TD-69	Tertiary Drain	299.9	0.50	Phase-02
TD-70	Tertiary Drain	650.8	0.50	Phase-02
TD-72	Tertiary Drain	270.5	0.50	Phase-02
TD-73	Tertiary Drain	1002.8	0.50	Phase-02
TD-74	Tertiary Drain	422.7	0.50	Phase-02
TD-75	Tertiary Drain	245.8	0.50	Phase-02
TD-76	Tertiary Drain	370.3	0.50	Phase-02
TD-77	Tertiary Drain	219.2	0.50	Phase-02
TD-78	Tertiary Drain	73.4	0.50	Phase-02
TD-79	Tertiary Drain	408.0	0.50	Phase-02
TD-80	Tertiary Drain	641.3	0.50	Phase-02
TD-81	Tertiary Drain	127.1	0.50	Phase-02
TD-82	Tertiary Drain	114.0	0.50	Phase-02
TD-84	Tertiary Drain	288.8	0.80	Phase-02
TD-85	Tertiary Drain	298.1	0.80	Phase-02
TD-86	Tertiary Drain	240.7	0.80	Phase-02
TD-87	Tertiary Drain	322.6	0.80	Phase-02
TD-88	Tertiary Drain	274.0	0.80	Phase-02
TD-89	Tertiary Drain	190.1	0.80	Phase-02
TD-90	Tertiary Drain	1108.9	0.80	Phase-02
TD-91	Tertiary Drain	990.8	0.80	Phase-02
TD-92	Tertiary Drain	1020.1	0.80	Phase-02
TD-93	Tertiary Drain	504.2	0.80	Phase-02
TD-94	Tertiary Drain	1728.3	0.80	Phase-02
TD-95	Tertiary Drain	1335.0	0.80	Phase-02
TD-96	Tertiary Drain	83.9	0.80	Phase-02
TD-125	Tertiary Drain	12.7	0.80	Phase-02
TD-127	Tertiary Drain	169.8	0.50	Phase-02
TD-20	Tertiary Drain	262.5	0.50	Phase-02
TD-97	Tertiary Drain	159.5	0.80	Phase-02
TD-41	Tertiary Drain	133.2	0.50	Phase-02
TD-40	Tertiary Drain	252.3	0.50	Phase-02
TD-42	Tertiary Drain	720.2	0.50	Phase-02
TD-43	Tertiary Drain	656.9	0.50	Phase-02
TD-71	Tertiary Drain	266.0	0.50	Phase-02
TD-83	Tertiary Drain	1516.3	0.80	Phase-02
Total (in km)		41.86		

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 bigger than tertiary drains but smaller than primary drains. Its catchment area is smaller than primary drains, but bigger than tertiary drains. It may run parallel to bigger roads. Secondary drains may run along and through the middle of its storm water contributing area. However in a built up area, it is difficult to have space for such alignment. Therefore, drains are built along roads. In Chandanaish, 15.85 km of new secondary drains have been proposed (*Table 3.7*).

Table 12.7: Proposals of New Secondary Drains in Chandanaish Pourashava

Drain ID	Drain Type	Length in Meter	Width in Meter	Phasing
SD-98	Secondary Drain	1751.2	1.00	Phase-02
SD-99	Secondary Drain	2260.8	1.00	Phase-02
SD-100	Secondary Drain	1052.8	1.00	Phase-02
SD-101	Secondary Drain	651.9	1.00	Phase-02
SD-102	Secondary Drain	1475.9	1.00	Phase-02
SD-103	Secondary Drain	1609.8	1.00	Phase-02
SD-104	Secondary Drain	472.0	1.00	Phase-02
SD-105	Secondary Drain	2072.5	1.00	Phase-02
SD-106	Secondary Drain	1904.5	1.00	Phase-02

Drain ID	Drain Type	Length in Meter	Width in Meter	Phasing
SD-107	Secondary Drain	889.1	1.00	Phase-02
SD-124	Secondary Drain	262.6	1.00	Phase-02
SD-126	Secondary Drain	817.9	1.00	Phase-02
SD-108	Secondary Drain	631.0	1.00	Phase-02
Total (in km)		15.85		

Primary Drain

Primary drains carry run-off or storm water to the destination. Their catchment area or storm water contributing area is bigger than mahalla or tertiary drains. In most municipal areas or even in Dhaka City Corporation it is difficult to find such naming or classifications. However such classifications can be seen in reference books. Primary drains generally are the under jurisdiction of municipality/city corporation. In big cities the drainage section of WASA is responsible for primary drains. These drains are constructed by brick, cement concrete and sometimes by excavating earth in their alignments. Sometimes borrow pits of the roads serve as drains provided borrow pits are uniformly and continuously excavated. Primary drains deliver its discharge usually to the rivers or larger khals. Primary drains may be of earthen structure provided sufficient land is available and land value is low. Contributing drainage water comes from households and other sources via secondary drains and tertiary drains. Mainly the existing khals will serve as primary drains. The khals are proposed to be lined up to prevent encroachment and erosion. Lining will also enable easy and quick flow of water during heavy rains. The Pourashava has 61 km of khals all that will serve as primary drains. Besides, new man-made primary drains will be of 25.54 km. Table 3.8 shows the details of new primary drains.

Table 12.8: Proposals of New Primary Drains in Chandanaish Pourashava

Drain ID	Drain Type	Length in Meter	Width in Meter	Phasing
PD-109	Primary Drain	398.8	1.50	Phase-01
PD-110	Primary Drain	4729.5	1.50	Phase-01
PD-111	Primary Drain	3167.2	1.50	Phase-01
PD-112	Primary Drain	1508.4	1.50	Phase-01
PD-114	Primary Drain	1810.5	1.50	Phase-01
PD-115	Primary Drain	1750.1	1.50	Phase-01
PD-116	Primary Drain	672.9	1.50	Phase-01
PD-117	Primary Drain	1952.5	1.50	Phase-01
PD-118	Primary Drain	2832.5	1.50	Phase-01
PD-119	Primary Drain	3236.8	1.50	Phase-01
PD-120	Primary Drain	1107.0	1.50	Phase-01
PD-121	Primary Drain	906.6	1.50	Phase-01
PD-122	Primary Drain	432.1	1.50	Phase-01
Total (in km)		24.50		

Outfall of Drains

There is no formal outfall of drains in or outside Chandanaish Pourashava. The primary drains mainly discharge storm water to the nearby khals. But these outfalls are not formally designed. Through the physical infrastructure survey and extensive field observation the consultant has identified outlets to the khals that passes through the Pourashava. Most of the katcha drains are closed ended without any outlet that causes overflows in the road and surroundings. Besides, 14 numbers of local outfalls are proposed with 29 existing outfalls to discharge storm and domestic waste water from tertiary drain to secondary drain as well as primary drains or khals (Table 3.9).

Table 12.9: List of Drain outfalls of Chandanaish Pourashava

Serial No	Outfall Id	Ward No
Existing Outfalls		
1	O-2, O-3, O-4, O-5, O-6	Ward No:01
2	O-29	Ward No:03
3	O-23	Ward No:04
4	O-1, O-9, O-10, O-22, O-27, O-28	Ward No:05
5	O-7, O-8, O-12, O-13, O-26	Ward No:06
6	O-14, O-15, O-16, O-17, O-18, O-19, O-20, O-21, O-24, O-25	Ward No:08
Proposed Outfalls		
7	O-30, O-31, O-42	Ward No:05
8	O-3	Ward No:03
9	O-33, O-34, O-35, O-38	Ward No:01
10	O-36	Ward No:09
11	O-37	Ward No:08
12	O-39, O-40, O-41	Ward No:06
13	O-43	Ward No:05

Drainage Development

The fund must be made available by the central government to develop the drainage system as per plan. It is beyond the capacity of Pourashava to fund such a huge project. It is apprehended that the entire drainage development as per plan would not be possible at a time as it would involve huge expenditure. So it is better to phase out the construction in the following way:

Phase 1: 2012-2016: 25.54 km. Primary Drains

Phase 2: 2016-2021: 41.87 km. of Tertiary Drains and 15.85 km. of Secondary Drains

Other required tertiary drains and minor drains will be developed by community based with close collaboration of the Poura authority.

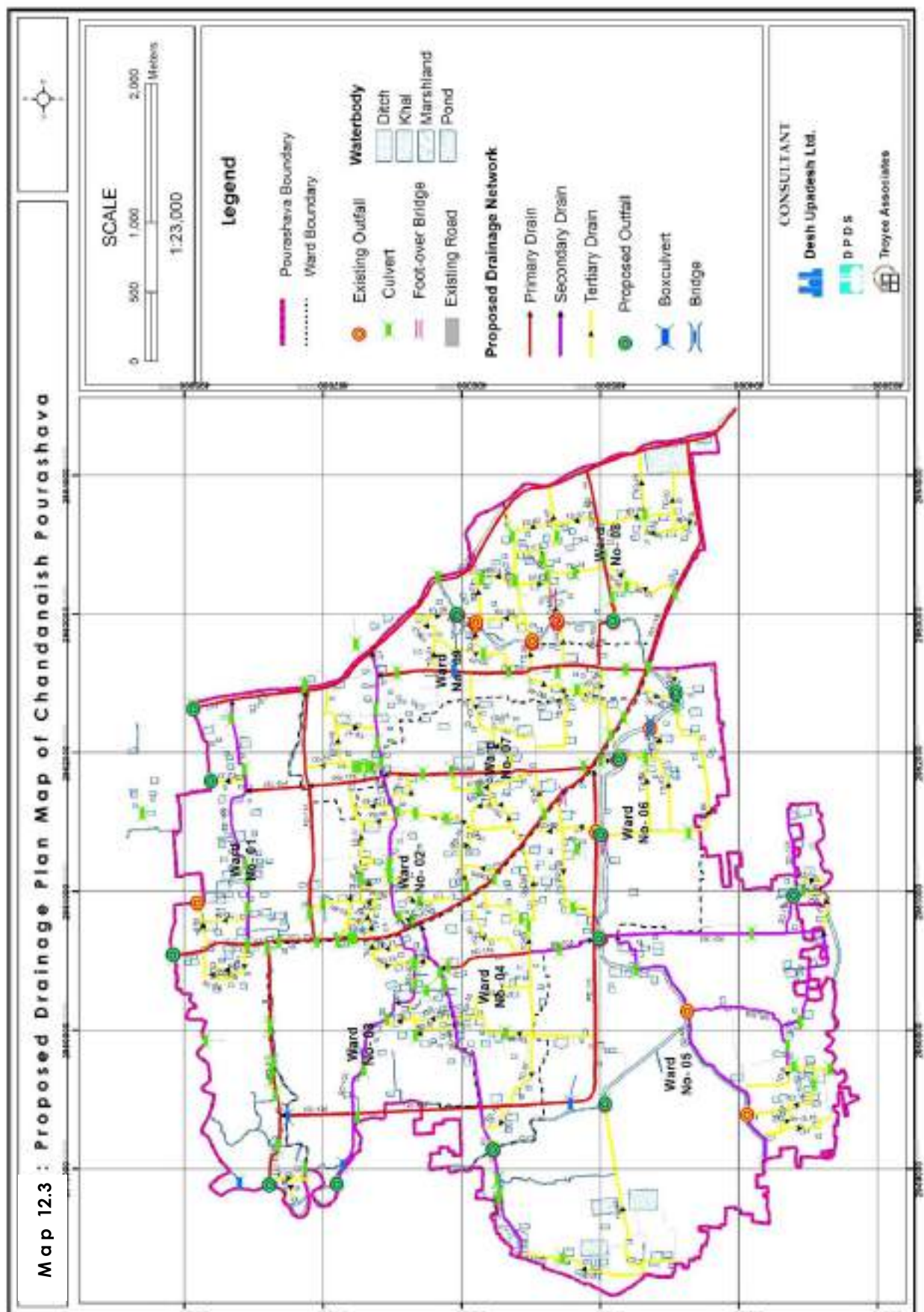
12.3.1.4 List of Infrastructure measures for Drainage and Flood Control Network

Bridge and culverts are the major infrastructures for drainage and flood control network need to be constructed in appropriate location of the canals, so that flash flood water can be drained quickly. Total 8 new box-culverts and 2 new bridges have been proposed. Table 3.10 shows the list of the bridge and culvert for drainage and flood control network in the Chandanaish Pourashava.

Table 12.10: List Bridge and Culverts in the Chandanaish Pourashava Area

Ward No.	Bridge	Culverts	Total
1	-	22	22
2	-	14	14
3	-	10	10
4	-	7	7
5	-	13	13
6	3	7	10
7	-	9	9
8	2	11	13
9	2	21	23
Total	7	114	121

Source: Physical Features Survey, 2009 and proposed by the Consultant.



12.4 Plan Implementation Strategies

12.4.1 Regulations to implement the Drainage and Flood Plan

For plan implementation the first requirement would be resources, which is highly lacking in the Pourashava. Chandanaish is a small Pourashava with very limited holding tax realized. So, the first strategy will be to increase its revenue and non-revenue earning income. The strategy is to build capacity of the Pourashava to implement the plan. Permission for additional manpower has to be sought from the government. At the same time additional fund has to be provided to pay for salaries and charges. 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 by imposing punitive measures like, fine on the waste disposer. The property owner beside the drains should be made responsible to look after the drains in front of his property and made responsible for any clogging.

The regulations which will be needed for the implement of drainage and flood plan are:

1. Section 3 of the Acquisition and Requisition of Immovable Property Ordinance, 1982 is needed for acquisition of land in view to construct drainage and flood control components. The Water Development Board, according to the demand, will apply to the Deputy Commissioner for such acquisition.
2. Water Development Board Ordinance, 1976 delegate power to the Water Development Board for construction of embankment. To control intrusion of flood water and improvement of drainage facilities, the Board is empowered to take necessary actions according to the regulations prescribed in the Ordinance.
3. Irrigation Act, 1876 has prescribed regulations for the improvement of irrigation facilities through the improvement of drainage facilities in view to increase agriculture production. Deputy Commissioner may enforce any regulations prescribed in the Act necessary for irrigation facilities.
4. Canal and Drainage Act, 1872 has enacted for excavation of canal and removal of drainage congestion from agriculture land. The Deputy Commissioner may authorize any person, through a written approval, for excavation of canal in view to improve irrigation facilities for agriculture practices.
5. Public Health (Emergency Provision) Ordinance, 1944 has enacted for the improvement of drainage and sanitation facilities. Department of Public Health Engineering (DPHE) is authorized to enforce the regulations prescribed in the Ordinance. The government approves project for DPHE mostly for the improvement of drainage and sanitation facilities in urban areas.

12.4.2 Implementation, Monitoring, Evaluation and Coordination of the Plan

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

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

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

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

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

Development control as an instrument of plan implementation may be selectively applied within the Urban Area Plans. Development controls would also be varied in intensity and detail to suit the particular circumstances. It is important that they should be clear and easily understood by all parties concerned. Since the entire Pourashava 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 efficiency of the urban land market would make, more private land available to urban households;
- would pass much of the development costs for local infrastructure to the private sector and land market mechanisms;
- would increase in land for development without large cash outlays by government to purchase land for development schemes; and
- would keep provision of land for community facilities virtually no cost to government.

Plan Monitoring

The Urban Area Plan would simply be tools for guiding and encouraging the growth and development of an urban area in a preferred manner. In a rapidly changing urban environment, the Urban Area Plan would require to keep up to date. If this is not done, within a few years it will be obsolete. Therefore, it is imperative that the requirement for regular updating of the Urban Area Plan be made a legal requirement. For implementation of the various programme components of the Urban Area Plan appropriate administrative measures will have to be undertaken. This will essentially include project preparation and monitoring of their execution and evaluation. For carrying out all these activities appropriate institutional measures are also needed.

Evaluation

Monitoring and evaluation of on going and implemented projects is essential to keep the future course of action on the right track. An on going project should be regularly monitored and handicaps identified to enable taking appropriate measures at the right time. Post implementation evaluation is also needed to take appropriate measures correcting past errors-from project preparation to implementation.

The top level supervision has to be done by a high level supervisory committee headed by Pourashava 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 Pourashava. The committee will supervise implementation works regularly and issue necessary instructions to expedite the works of implementation.

Co-ordination

A Planning Section of Pourashava should have close interaction with the citizen of Pourashava 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 Pourashava 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 winning 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.

B: Environmental Management Plan

12.5 Introduction

12.5.1 Goals and Objectives

All planning activities should be directed towards developing liveable urban environment with special focus on incorporating carbon free green city.

12.5.2 Methodology and Approach to Planning

Every development project has some positive and negative impacts. The negative impacts of this project are not higher than that of positive impacts. The major environmental problems in the project area are related to drainage system, sanitation, solid waste management, industrial waste disposal, water pollution and air pollution. Environmental management strategies aimed to achieving greater economic efficiency and improving cost recovery.

12.6 Existing Environmental Condition

12.6.1 Introduction

The major environmental problems in the Chandanaish Pourashava are related to drainage system, sanitation, solid waste management, water/ air/ sound pollution and land pollution. Besides water logging in the low lying areas within the pourashava area is another major concern. Except for a rain gauge, Chandanaish Meteorological Office does not have any other measuring device. But considering the proximity to Chittagong, the climatic features, environment and other natural phenomenon of Chandanaish Pourashava may be expected to be similar with the Chittagong district.

12.6.2 Geo-morphology

Geology in the Chandanaish and its adjacent district Chittagong is composed of sandstones, alternating with beautiful laminated bluish-grey shales and siltstones. These sediments are probably of fluviatile origin through some of the even-bedded siltstones and shales of considerable lateral extent of shallow marine beds.

There are four main soils or physiographic units can be recognized, viz.

- I) The higher hill ranges occupy a narrow belt a few miles behind the coast along the eastern border of Cox's Bazar, The most common soils are strong brown, friable, silty clay loams and silty clays which grade into broken shaley rock at 2-4 feet. All soils are strongly acid in reaction.
- II) The lower hill ranges are developed in unconsolidated sands and clays of the Dupi Tila formation. They are mainly less than 250 feet high flat-topped upland areas dissected by steep-sided narrow valleys north of Ramu in Cox's Bazar District. Soils are mainly deep, red, friable, clay loams to clays. All the soils are strongly acid and sandy soils are droughty.
- III) The coastal plains are underlain by heavy marine or tidal clays characterized by more sandy and silty deposit near the foot of the hills and along the course of rivers and streams which cross the plains. Near the coast, some of these soils becoming saline at the end of the dry seasons.
- IV) The tidal mangrove swamps are most extensive at the mouth of the Matamuhuri river, where they form the Chakaria Sundarbans and also along the sides of other tidal rivers and creeks in Cox's Bazar district, especially along the Naf river. Here the soils are grey clay flooded twice daily by saline water and unsuitable for agriculture.

12.6.3 Temperature

The maximum temperature in the year reached between the last week of March and end of May. Temperature data is recorded at three stations named of Chittagong, Cox's Bazar and Rangamati. Chandanaish is close to the Chittagong. The average maximum temperature in the Chittagong is 33.7°C in April and minimum is 14.8°C in January during 2006.

12.6.4 Humidity

The humidity is high throughout the year. March and April are the least humid months in the country. The relative humidity is everywhere over around 80 during June, July, August and September. The least humid month in the southeastern area is January, February and March. Lowest average humidity is recorded 63 at Chittagong.

12.6.5 Hydrology

Hydrology of the Chandanaish Pourashava assumes to be similar with the coastal plains of Chittagong presents a complicated interaction of fresh water flow from the upstream, the tides and tidal flows from the Bay of Bengal. Tropical Cyclones, storm surge and other meteorological effect are occurred from the sea that affects Chandanaish Pourashava as well.

12.6.6 Solid Waste and Garbage disposal

With the increase of population and rapid urbanization it is natural that generation of solid waste will also increase. If these wastes are not properly managed, it can have detrimental effects on the environmental quality. So collection and management of solid waste is a great challenge for the Pourashava authority. In the rural areas there are low lying vacant lands alongside almost all the households and solid wastes are dumped there. But a substantial amount of solid waste that are generated daily are not collected and disposed off which eventually find their way into roadside drains or canals or incidental spaces or in vacant plots in between settlements thus making the urban living hazardous.

12.6.7 Latrine

According to the Pourashava authority, most of the people in this area used sanitary latrines. From the socio-economic survey it can be seen that about 89.6 percent households have been used sanitary toilet. There are 10.9 percent respondents reported to use insanitary latrines and the remaining 2.2 percent has no toilets particularly in the Ward 1.

12.6.8 Pollutions

12.6.8.1 Water Pollution

Water pollution has been caused with the discharge of sewage and other oxygen demanding wastes. Strong sewage or waste from industry can be lead to the depletion of the dissolved oxygen in the water. Inadequate water supplies for drinking and domestic uses and inefficient of non-existent sanitation facilities also are the important factors affecting human health. Improper solid waste management and weak sanitation facilities are the major causes of water born disease in the study area.

12.6.8.2 Air Pollution

Man made air pollution in urban areas is often referred to as 'smog' originated from industrial and household fuel combustion. Motor vehicle fuel combustion process also emits smog in the study area. Increase air pollution beyond the tolerance rise the incidence of respiratory disease. Few

small scale industries within the pourashava area also cause air pollution, although, their effect in the pourashava is very insignificant. Chittagong-Cox's Bazar Highway crosses through the eastern side of the pourashava. A large number of vehicles cross within this route, nevertheless, their effect in the pourashava is not available right now and difficult to make any comment without any research.

12.6.8.3 Sound Pollution

The major cause for environmental noise in the study area is the noise of traffic. This is a common experience of the population that noise poses a threat to their health and nerves. The most violators and destroyers of tranquility are the motor cycles, trucks, auto-rickshaws and passengers cars.

12.6.9 Natural Calamities and Localized Hazards

12.6.9.1 Cyclone

Several destructive cyclonic storms have visited Chittagong due to its tropical location. A tropical cyclone is generally born in the warm moist air overlying the ocean south of latitude 20°. Chittagong has suffered severely cyclonic storm- wave at different times when its direction moves towards the Chittagong and the Arakan coast. Most striking features of the cyclone are the centre and the magnitude of the storm area.

These two causes produce a large accumulation of water at and near the centre, which progress with the storm and give rise to a destructive storm-wave when centre reaches the shelving coast. It then sweeps inland and wide-spread damage is occurred. Tables below show the major cyclonic storms and tidal surges and nature of damages in Bangladesh due to cyclone. Sitakunda, Chittagong and Cox's Bazar are considered the points of landfalls of cyclonic storms. Affected areas from these points are considered the nature of damage of the cyclonic disaster.

12.6.9.2 River Erosion

There is no river within Chandanaish Pourashava. Several khal acted as the natural drainage system of the Pourashava. However, there is no mentionable erosion in the study area.

12.6.9.3 Land Pollution

Land Pollution is the degradation of land surface often caused by human activities and misuses of land. It occurs when waste is not disposed properly. Extensive use of synthetic chemical fertilizer and pesticides in the crop fields is another source of land pollution and thus a threat to human health. The major problems are the discharge of toxic effluents and the agricultural run-offs contaminating soil. Upazila Agricultural officer in the Chandanaish Upazila reported to use pesticides and chemical fertilizer in the crop fields but difficult to quantify its impact to the environment.

12.6.9.4 Earth Quake

Earth quake in this area is not a regular phenomenon. Although several earth quakes were observed in this area over the past decades but the intensity was very low and no damages occurred due to earth quake.

12.6.9.5 Water Logging

Existing drainage system of Chandanaish Pourashava has been made during topographical survey. Survey finding revealed that eastern side of the Pourashava comprising high land and

gradually down towards the western side of the pourashava. Water logging occurs in the rainy season due to poor drainage network system.

12.6.9.6 Flood

The mainland surround the pourashava is generally high from the level of tide and as a result most of the area is free from flood. But in rainy season some area of the pourashava are goes under water logging due to encroachment of canal.

12.6.9.7 Fire Hazard

With the expansion of the city boundary and population, the chances of fire incidence may increase for offices, institutions, market places, growth centers and industries. Electric short-circuit is mainly responsible for fire hazards in urban area. However, human error may also cause incidence of fire hazard sometimes. Some industries like garments and plastic products are more susceptible to fire hazards.

12.7 Plans for Environmental Management and Pollution Control

12.7.1 Proposals for Environmental Issues

12.7.1.1 Solid waste Management Plan

Promoting and sustaining community based waste collection system need to be promoted for introducing an effective solid waste management system. In this process separation of organic and inorganic components of the waste can be performed at the source of waste generation, preferably by using separate bins for different types of litters.

Solid wastes generated from urban dwellers can be a cause of degradation of environment. This issue is to be dealt with due importance in order to maintain a good quality of environment.

Biodegradable wastes can be transformed into compost using low cost local technology. Likewise metals and papers can also be reused in industries.

For this pourashava, the consultant proposes 1 solid waste disposal site within ward no. 1 and 6 waste transfer stations at different locations of ward no. 1, 2, 3 and 9. Among these, there are 3 waste transfer stations located in different places of ward no. 2.

Mitigation Measures:

1. *Introduction home collection system on community initiative.*
2. *Creation of solid waste transfer stations at important locations.*
3. *Creation of a dumping site for disposal of solid waste.*
4. *Uses of sanitary land fill method for treatment of waste at the dumping site.*
5. *Introduce recycling of solid waste.*

12.7.1.2 Plan for Protecting Open space, Wetland and Relevant Features

Open space and wetland are precious assets for protecting the healthy environment of flora and fauna. Apart from their scenic beauty, they have great economical and environmental value. Wetlands are abundant in natural resources on which livelihood of many people depend. Wetlands offer habitats to a number of species as well. Hence no urban intrusion should be allowed to wetlands characterized by rich natural habitat and high agricultural productivity. Rather these areas should be preserved through sustainable interfacing between wetland biodiversity and livelihood of local people.

All water bodies, hilly area and the existing open space must be preserved and protect from any development.

Mitigation Measures:

1. *The open space provisions have to be implemented to save future town environment.*
2. *Adequate fund is needed to be allotted to execute open space development.*
3. *No building permission should be accorded in locations earmarked for open space in the master plan.*
4. *Land owners may be motivated to donate land for open space development.*

12.7.1.3 Proposals for Pollution Control

Environment has become a major concern as uncontrolled development has already started to produce its negative impact on nature.

12.7.1.3.1 Industrial Pollution Control

There is no large industry in the Chandanaish Pourashava area. However, industries outside of the pourashava discharge of untreated effluent which do not have significant impact yet on the pourashava but might create problem in future. Some Industrial discharge contains toxic chemicals. If those wastes are not treated properly they can get involve into the aquatic lives and ultimately can affect different species of lives.

Saw mills & rice mills are the major industries of Chandanaish Pourashava. The study team recommends not allowing heavy industries in future within the pourashava premises.

12.7.1.3.2 Air/ Water/ Land/ Sound Pollution Control

Major air pollution is created by industrial emission and automobile exhaustion. At present, there are few industries in the Pourashava area. Therefore, air pollution is not a problem right now. It is apprehended that air pollution level will increase in the near future with increase of motor vehicles. In order to prevent air pollution mitigation technology has to be incorporated in the existing industry/ plant.

Water is the backbone of any settlement. Without easy and abundant supply of safe water, no settlement can prosper. The surface water pollution level may increase for high volume of discharge of wastewater, sanitary sewage, over spilling of pit and septic tank. Therefore, care should be taken to implement the solid waste development plan.

Source of sound are transportation systems, industries, frequent miking, ambulance siren, construction works, generators, stone crushing etc. At present general level of noise of the project area is below than that of DoE standard. But it can be assumed that with the expansion of urban area and settlements, the noise pollution will increase due to improved number of motor vehicles, market places, industries, mass gathering etc.

12.7.2 Natural Calamities and Hazard Mitigation Proposals

12.7.2.1 Plan for Addressing Natural Calamities

In Bangladesh, natural disasters like floods and cyclones cause extensive damage to lives and properties in both urban and rural areas. In recent years, people have become more aware about the possibility of disaster due to earthquake because of the way developments are taking place in urban areas. Serious consideration, therefore, should be given to including disaster management within urban and national development strategies. Disaster management plan addressing the construction of cyclone centers along the coastline should be constructed in order to protect man and animals. Chandanaish Pourashava authority should well equip with disaster management and quick response to warning and risk management.

Mitigation Measures:

1. Provide housing loan to build houses with permanent materials.
2. Take measures to promote employment and reduce poverty.
3. Take appropriate measures for post disaster loss mitigation.

12.7.2.2 Protection Plan Addressing Regular Hazards

- Most of the natural canals and water courses will be preserved and maintained. The ponds larger than 0.2 acres should be preserved as a water reservoir.
- For the removal of drainage congestion, sufficient number of bridges and culverts should be provisioned during construction of roads.
- Indiscriminate land filling for expansion and construction of residential areas and buildings should be controlled with the imposition of agriculture policy.

12.7.2.3 Protection Plan Addressing Encroachment & Other Relevant Issues

- As a measure of protection from encroachment restrictive buffer zone will be created on both sides of natural canals and other watercourses (if necessary). Walkways and plantation will be needed for the protection of those buffer zones.
- Formation of appropriate legislation on solid waste management will be necessary. People encroaches canal through dumping of solid wastes. Encroachment on road, canal and river should be removed as early as possible with the formation of joined collaboration committee. This committee may be formed with the members from Pourashava, LGED, RHD and WDB.
- Using of waste as an unutilized resource and assisting in recycling of waste for conservation of resources and protection of environment.
- Introduces environmental education especially sanitary habits in school curriculum.

Development of commercial and industrial activities should be restricted in the high land. It is mentioned that high land generates huge surface runoff during rainy season. Frequent flood and water logging is the common disaster around this hilly areas of the Chandanaish Pourashava.

12.8 Plan Implementation Strategies

12.8.1 Regulations to implement the Environmental Management Plan

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

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 Pourashava 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 efficiency 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.

12.8.2 Implementation, Monitoring, Evaluation and Coordination

Plan Monitoring

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

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

Evaluation

Monitoring and evaluation of on going and implemented projects is essential to keep the future course of action on the right track. An on going project should be regularly monitored and handicaps identified to enable taking appropriate measures at the right time. Post implementation evaluation is also needed to take appropriate measures correcting past errors-from project preparation to implementation.

The top level supervision has to be done by a high level supervisory committee headed by Pourashava 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 Pourashava. The committee will supervise implementation works regularly and issue necessary instructions to expedite the works of implementation.

Co-ordination

A Planning Section of Pourashava should have close interaction with the citizen of Pourashava 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 Pourashava 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 winning 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

Sensible urban planning is critical to the healthy growth of cities. Unplanned growth leads a number of problems, creating misery for urban dwellers and making remedying of those difficulties. Yet flawed urban planning is little better, or perhaps worse, than no urban planning at all. It is thus important, when taking on such an enormous task as the drafting of an Urban Area Plan for a Pourashava, to ensure that the plan is well considered and likely to be conducive to good health and well-being of the urban dwellers.

Consideration for the preparation of Urban Service

- (a) 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.
- (b) Set forth the functional role of each service provider in the future provision of the urban service.
- (c) Determine the future service area for each provider of the urban service.
- (d) 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.

Range and Content of the Urban Services

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

The Plan concern where services will be located (expected development). It also indicates how the Structure Plan policies will govern the areas and the standard for services calculated (based on the population forecast).

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

This section describes the urban basic services development proposals for future development of the Pourashava. The proposals have been made at the town level, that is, the area under the urban area plan. The local level development proposals will be addressed in the Ward Action Plan. Provision of adequate utility services, such as water supply, sewerage and sanitation, drainage, electricity, energy, waste disposal, telecommunication in urban centres and their proper maintenance have major contributions in advancing the cause of sustainable and environmentally sound development. Therefore, proper consideration of urban services should be included in the urban planning process.

13.2 Analysis of Existing Condition and Demand for Services

13.2.1 Introduction

Considering the dispersed nature of settlements, it becomes extremely difficult and costly to provide utility services under any network. Hence isolated local level utility provisions are suitable for the area.

13.2.2 Analysis and Projection on Existing and Proposed Urban Services

Electricity

All the 9 wards of the pourashava have been brought under Rural Electrification Programme which is characterized by load shedding and voltage fluctuations According to BBS 2001, all the unions of the upazila have been brought under rural electrification programme. However, majority of the respondent (91 percent) are reported to moderate satisfaction about the quality electricity. Below one percent are satisfied with the service of electricity and 8.3 percent reported to poor performance of the services of electricity.

Water supply

Sources of drinking water in the Pourashava are primarily collected from ground water found at different depths. According to the field survey, there are various sources of water supply available in the study area. There is no piped water supply system in the Chandanaish Pourashava. Most of the families (45 percent) have no tube-well. They used neighboring community tube well for drinking purposes. About 29.4 percent have their own tube well for drinking. A significant number of households depend on Pourashava or Govt. tube well for safe drinking water.

Solid waste management

With the increase of population and rapid urbanization it is natural that generation of solid waste will also increase. If these wastes are not properly managed, it can have detrimental effects on the environmental quality. So collection and management of solid waste is a great challenge for the Pourashava authority. In the rural areas there are low lying vacant lands alongside almost all the households and solid wastes are dumped there. But a substantial amount of solid waste that are generated daily are not collected and disposed off which eventually find their way into roadside drains or canals or incidental spaces or in vacant plots in between settlements thus making the urban living hazardous.

Sewage Disposal

Isolated septic tank-soak well system with water sealed pan is recommended for each household instead of hanging latrines.

Gas

There is no gas supply in the Pourashava. Most of them are used wood and kerosene fuel for cooking purpose. Present government does not encourage using supply gas for domestic purposes due to the shortage of gas availability. In this circumstances bio-gas and traditional fuel using scientific household kiln may be good alternative.

13.3 Proposals for Urban Services and Implementation Strategies

13.3.1 Introduction

From past experience observed in the major cities, that plans prepared for planned development and development control has been neglected and piece-meal type development schemes were undertaken resulting in total chaos in urban living. It is unfortunate that town planning is not a part of our cultural practices. Individuals love to go at will without respect to planning norms. As such it is essential that some sort of awareness to be built among the people of follow the plan. On the other hand the respective authorities should become sincere and dedicated to implement the plan.

13.3.2 Proposals for Urban Services

Existing urban services are not adequate for meeting the demand by 2031. Therefore, proposal for urban services are distributed in appropriate locations in the Pourashava in order to plan and equitable manner.

Table 13.1: Proposed Urban Services Facilities for a period 20 Yrs.

Type of Facilities	Ward No.	Mouza Name	Plot No.	Area (acre)
Fire Service	03	Uttar Joara JL _13_01	2295, 2298, 2302-2308, 2310-2319, 2321-2325, 2330-2335, 2338	2.56
Public Toilet	09	Gacbaria JL _22_02	5585-5587, 5589, 5594-5597, 5607	1.43
Solid Waste Disposal Site	01	Uttar Joara JL _13_01	270, 480-485, 492-496, 498-520, 555-561, 566-576, 578-589, 618-620	7.92
Waste Transfer Station	01	Gacbaria JL _22_01	580, 607, 608	0.05
	02	Chandanish JL _23_00	57,58	0.04
		Chandanish JL _23_00	76, 1188-1190, 1284	0.21
		Chandanish JL _23_00	15,16	0.13
	03	Uttar Joara JL _13_01	2551-2555	0.1
	09	Gacbaria JL _22_01	1962, 1963	0.07

Source: Proposed by the Consultant.

Solid Waste

One solid waste disposal site with 8.1 acres and 6 waste transfer stations with 0.6 acres have been proposed to ensure proper waste management up to year 2031. Map 4.1 shows the location of proposals

13.3.3 Regulations to Implement the Proposals

Chandanaish Pourashava should be equipped with sufficient number of qualified planners and logistic to enable them monitor the development within the Pourashava area. This will help them effectively guide both for utility management as well as effective development control. Also the development control will be by the guidance of following ordinance:

Local Government (Pourashava) Ordinance, 2009 (Ordinance No. XLXVIII of 2009) was enacted in 6th October 2009. According to the 2nd Schedule, Sl. No. 10, the Pourashava 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 Pourashava shall be subject to control, regulation and inspection by the Pourashava. 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 Pourashava.

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

The sewerage facilities may be provided by the Pourashava and Directorate of Public Health Engineering (DPHE). According to the 2nd Schedule, Sl. No. 12, of the Local Government (Pourashava) Ordinance, 2009, Pourashava may provide an adequate system of public drains and all such drains shall be constructed, maintained, kept, cleared and emptied with due regard to the heal and convenience of the public. All private drains shall be subject to control, regulation and inspection by the Pourashava.

Public Health (Emergency Provisions) Ordinance, 1944 (Ordinance No. XXI of 1944) was enacted in 20th May 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 Pourashava. The existing authorities will be needed for electrification of the Pourashava according to the guidelines presented in the plan.

Telegraph and Telephone Board Ordinance, 1975 (Ordinance No. XLVII of 1975) was enacted in 30th August 1975. A Telegraph and Telephone Board (T&T Board) was composed through this Ordinance. Section 6(1) of the Ordinance has prescribed the functions of the Board and said, it shall be the function of the Board to provide efficient telegraph and telephone services and to do all acts and things necessary for the development of telegraphs and telephones. In the Pourashava, 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.

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 Pourashava. The existing authorities will be needed for electrification of the Pourashava according to the guidelines presented in the plan.

13.3.4 Implementation, monitoring and Evaluation of the Urban Services Plan

Mayor of the Chandanaish Pourashava will be the most responsible authority for implementing the development of the urban services. Addition to this, Chandanaish Pourashava authority should take initiative to foster better co-ordination among the stakeholders for implementation, monitoring and evaluation of the urban services. Involving the stakeholders especially the Chandanaish Upazila authority should stop all unauthorized construction.

Establishment of support mechanisms will be placed in such way that the people of all income groups in general and of those living in poverty and the disadvantaged to have access to basic services. Properly set user fees and charges for utility services are the most effective means of managing demand.

Monitoring

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

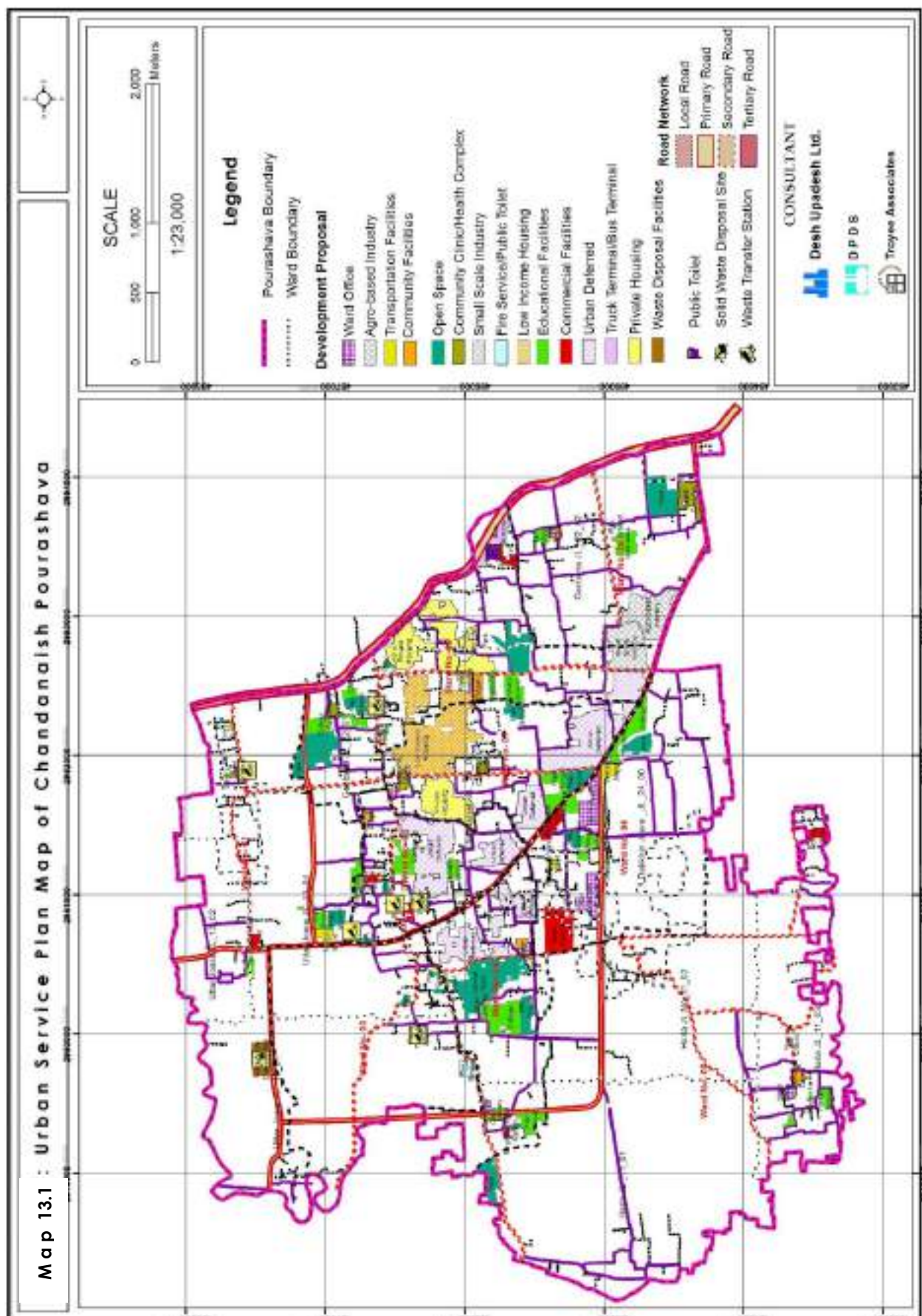
For implementation of the various programme components of the Urban Services Plan appropriate administrative measures will have to be undertaken. This will essentially include project preparation and monitoring of their execution and evaluation. For carrying out all these activities appropriate institutional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

Evaluation

Monitoring and evaluation of 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 Pourashava 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 Pourashava. The committee will supervise implementation works regularly and issue necessary instructions to expedite the works of implementation.





PART-C
WARD ACTION PLAN

Part C: Ward Action Plan Report

Chapter 14: Action Plan for Ward Area

14.1: Introduction

14.1.1: Background

At present there has no proper Master Plan for development of Chandanaish Pourashava. In the absence of proper Master Plan, construction of all types of infrastructure like houses, roads, drains, markets are going on unabated in an unplanned pattern. This situation is creating an adverse milieu in the original landscape thereby creating environmental hazards. In view of this grave situation it has, therefore, been contemplated that Structure Plan, Urban Area Plan and subsequent Ward Action plan will help to be organized development of the Chandanaish Pourashava. With the implementation of these plans, positive change in the life style of the people of the Chandanaish Pourashava is expected to be safe, comfort and less jeopardy.

14.1.2 Content and form of Ward Action Plan

The Ward Action Plan report has been divided into five main parts. These are preceded by introductory section which explain the approach of the report and provide background with the linkage of Structure Plan and Urban Area Plan. Section two of the report identifies strategies and policies prescribed in the Structure Plan and Urban Area Plan and their uses for the preparation of Ward Action Plan. This section also covers prioritization in case of development needs and Ward-wise Action Plan for next five years. Ward-wise Action Plans of different wards are being presented in the next nine sections of the report. Proposal, priority tasks and financial involvement with the infrastructural development as a priority basis are the outcome of this part. Implementation guidelines are the key issues of part four. Comparative Advantage of Plan and Proposals for mitigation of identified issues are the components of last part of this report.

The Ward Action Plan has been contained list of priority schemes for the development of roads, drains, traffic management and other social infrastructures for implementation during the first five years of plan period. It also contains the phasing of proposals and the means of implementation. The Proposals Map show where the policies and proposals apply. In addition to indicating the priorities, a Ward Action Plan includes proposals identified by other agencies and bodies expected to happen within the period of the Plan. However, any dates and costs shown against proposals are liable to change as programs and the availability of resources are revising annually.

14.1.3 Linkage with the Structure and Urban Area Plan

The study envisages formulation of a three-tier development plan (Structure Plan, Master Plan and Ward Action Plan) for the planned and orderly development of the Chandanaish Pourashava.

Structure Plan is basically concerned with development of broad strategies for managing and promoting efficient urban development over the medium and long term and attempts to integrate economic, physical and environmental objectives. Thus a Structure Plan provides a broad framework for development activities over a long period of time in and around the Chandanaish Pourashava. Several priority projects have identified in the structure plan, which would be implemented as Ward Action Plan through people's participation.

Urban Area Plan is prepared for managing and promoting development over medium terms following the broad guidelines set by the longer term Structure Plan. It shows the city structure of sub-system in space over the medium term of 10 years. The plan address the outline more specific area-wise development policies to guide development over the medium terms. Other purpose of preparing Urban Area Plan is to facilitate the development control function. It shows the broad land use zones on a more detailed scale of maps as derived from the Structure Plan.

Ward Action Plan provides guidance for development where action is expected in the short term and covers individual parts of a city within a variable time frame. It comprises high priority projects and programs that can be implemented in a relatively short time period of 5 years, in an intensive manner.

14.1.4 Approach & Methodology

The Ward Action Plan will be guided by the policies and proposals of upper level plans and provides guidance for development where action is expected within a variable time frame. It comprises high priority projects and programmes that can be implemented in a relatively short time period, in an intensive manner.

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

The methodology could be illustrated through tri-step process for the assessment of Ward Action Plan (Figure-1.1).

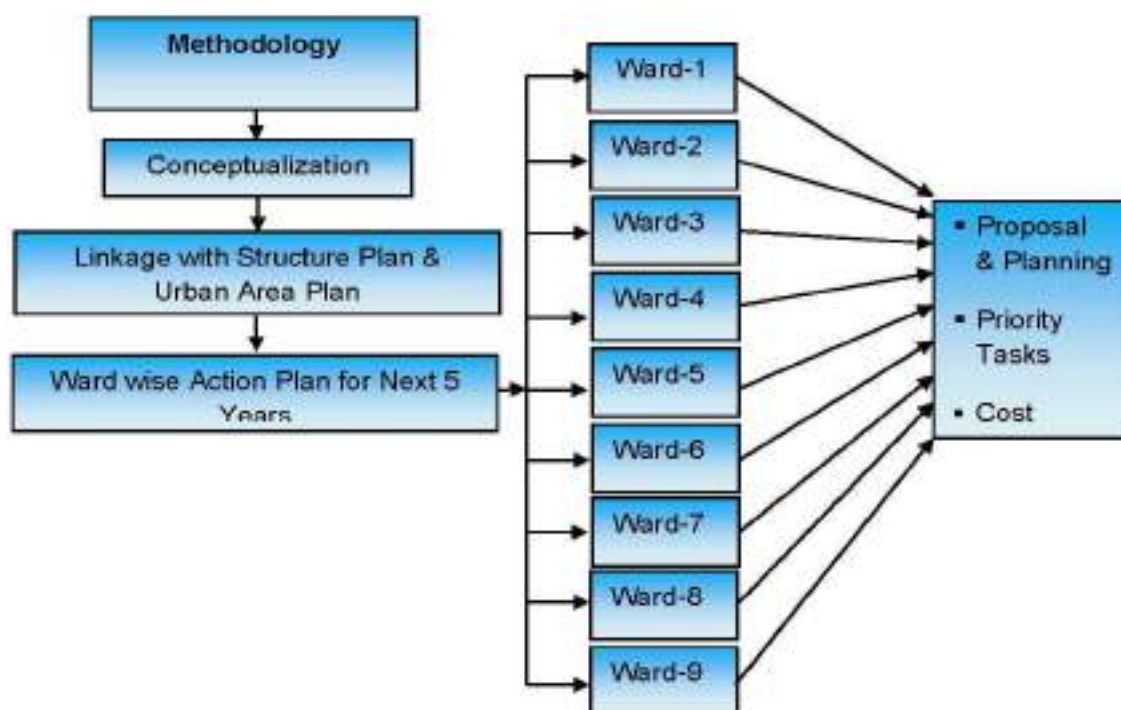


Figure 14.1: Methodology of Ward Action Plan Preparation

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

14.2: Derivation of Ward Action Plan

14.2.1 Guidelines of Structure Plan

Structure Plan provides a broad framework for development activities over a long period of time in and around the Chandanaish Pourashava. This is higher-level development guidelines followed by people's aspiration, development directions and opportunities for growth and development. Urban Area Plan is prepared on the basis of strategies and policies, which, adopted in the structure plan. Urban Area Plan is to facilitate the development control function. Ward Action Plan is the lowest tier of the development plan guided by Urban Area Plan.

14.2.2 Directions in the Urban Area Plan

Urban area plan encompasses the land use plan, transportation and traffic management plan, drainage and environmental management plan and plan for urban services. All of these plan are prepared for 9 wards of the Chandanaish Pourashava to develop and update provisions for better housing, infrastructures for roads, markets, transport network, bus terminals, sanitation, water supply, drainage, solid waste management, electricity, education, leisure and such other infrastructure facilities for meeting the social and community needs for better quality of life. Ward action plan is exclusive Ward plan proposal derived from the urban area plan.

14.2.3 Prioritization of infrastructure/development schemes

There are five critical issues are considered for development schemes that are given more priority in the Ward Action Plan. Roads network, Drainage Network, supply water, urban services and open space for recreation are discussed elaborately in the form of development proposal.

14.2.4 Ward wise Action Plan for Next Five Years

The Ward Action Plan is spanning for the 5 years period. Ward wise priority schemes are considered for the next five years action plan. In all Pourashavas of Bangladesh, a number of development projects going to be implemented through different projects under several government authorities and agencies. In a broad category, those projects are concentrated mainly construction of urban infrastructures, providing municipal facilities, construction of drainage infrastructure, solid waste management, sanitation program and tree plantation. Different government organizations named Roads and Highways Division, LGED, Directorate of Public Health Engineering, Bangladesh Water Development Board and Directorate of Environment are implementing those activities. In addition to that several NGO's and private organizations are also taking part in some Pourashava development related projects. In the year 2012, government has allocated funds towards Chandanaish Pourashava based on the unit cost according to the work component.

14.3: Ward Action Plan

14.3.1: Action Plan for Ward 01

14.3.1.1 Criteria for the Plan Proposal

Demography

Ward No. 1 is located on the northern part of the Pourashava. As per the pourashava population census data of 2011, the Ward No. 01 had a population of 8925 persons. Family size was 6; sex ratio was same with male and female. Population projection shows 9615 population for the year 2016. For the same year, it has a gross density of about 14 persons per acre and it will be 17 persons per acre in 2031. Table 3.1.1 shows the detail.

Table 14.3.1A: Population Statistics of Ward No. 01

Item	Year				
	2011	2016	2021	2026	2031
Area (Acre)	709.53	709.53	709.53	709.53	709.53
Population	8,925	9,615	10,358	11,158	12,021
Population Density per acre	13	14	15	16	17

Source: Chandanaish Pourashava, 2011

14.3.1.2 Critical Issues and Opportunities of the ward

Critical Issues

Ward no. 1 is the northern part of the Chandanaish Pourashava with characteristics of some urban and mostly predominant rural activities. It has the following critical issues,

- Lack of basic facilities and infrastructures required for an urban area.
- There is no systematic drainage and solid waste management facilities.
- Lack of adequate road.
- There is no water supply network at this ward.
- There is lack of commercial, open space, recreational, educational and social gathering facilities.

Development Opportunities

Due to low density of population and having external road linkage by Chittagong-Cox's Bazar highway i.e. Arakan Road creates development opportunity of this ward. The development opportunities are as follows,

- From environmental point of view, low density population can create a very livable environment for the area with respect to ventilation, use of road and other basic services.
- Some khals inside of Chandanaish Pourashava plays an important role in drainage system.
- Chittagong-Cox's Bazar highway i.e. Arakan Road also plays pivotal role to develop different facilities due to tourist attracting zone of Cox's Bazar, Teknaf and Saint Martin as well as Landport of Teknaf.

14.3.1.3 Proposals and Plan for Ward No. 01

14.3.1.3.1 Review of Existing Land Use

Ward no. 01 is mostly rural but only a few areas urban in character. Out of total 709.54 acres of land of this ward, around 463.99 acres of land i.e. 65.39% is reserved for agriculture. In existing land uses, both the urban residential and rural homestead has been considered as residential use as a whole. The residential use with 117.29 acres, occupies 16.53% of total land, water bodies 14.10%, circulation network 1.42% and commercial activities 1.03%. Only 0.22% of land is used as government service. There is only 0.42% land for urban green space and recreational facilities. No other notable type of land uses are found in this ward. *Table 3.1.2* shows the existing and proposed land use pattern of the ward (*Map 3.1A and Map 3.1B*).

14.3.1.3.2 Proposed Land Use Zoning

The category wise proposals are presented here. *Table 3.1.2* shows the amount of land existing and proposed uses in Ward no. 1.

i. Urban Residential Zone

At present around 117.29 acres land is occupied by urban residential use as a whole. In Ward Action Plan of Ward 01, around 0.50 acre of land has been earmarked for urban residential use which will occupy 0.07% of the total land in Ward 01.

ii. Rural Settlement

As this Ward is predominantly rural in character, a large portion of land like 135.60 acres (19.11%) of land is proposed for rural settlement up to the year 2031.

Table 14.3.1B: Summary of the Existing Land uses and Proposed Land uses

Sl. No.	Existing Landuse	Area in Acres	%	Sl. No.	Proposed General Landuse	Area in Acres	%
1	Residential	117.29	16.53	1	Urban Residential Area	0.50	0.07
				2	Rural Settlement	136.27	19.19
2	Education and Research	2.93	0.41	3	Education and Research	5.93	0.84
3	Governmental Services	1.55	0.22	4	Governmental Office	1.53	0.22
4	Non Government Services	1.01	0.14	5	Health Services	0.83	0.12
5	Commercial Activity	7.29	1.03	6	Commercial Zone	6.09	0.86
6	Manufacturing and Processing Activity	-	-	7	General Industry	-	-
7	Mixed Use	-	-	8	Mixed Use	-	-
8	Circulation Network	10.06	1.42	9	Circulation Network	37.82	5.33
9	Transport and Communication	-	-	10	Transport and Communication	2.90	0.41
10	Service Activity	0.52	0.07	11	Utility Services	8.15	1.15
11	Community Facilities	1.91	0.27	12	Community Facilities	1.90	0.27
12	Recreational Facilities	-	-	13	Recreational Facilities	-	-
13	Restricted Area	-	-	14	Restricted Area	-	-
14	Agriculture	463.99	65.39	15	Agriculture	434.06	61.13
15	Urban Green Space	2.96	0.42	16	Urban Green/ Open Space	10.65	1.50
16	Water Bodies	100.03	14.10	17	Water Bodies	61.71	8.69
17	Vacant Land	-	-	18	Historical & Heritage	-	-
18	Forest	-	-	19	Forest	-	-
19	Miscellaneous	-	-	20	Miscellaneous	1.70	0.24
				21	Urban Deferred	-	-
Total		709.54	100	Total		709.54	100

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

iii. Education and Research

In Ward Action Plan, one Primary school is proposed along with a library which comprises an area of 3.27 acres.

iv. Government office

In ward no. 1, a ward councilor's office with an area of 0.49 acres of land has been proposed as a ward center. The *Table 3.1.2* has shown in detail and Annexure-7 shows the mouza wise plot proposal of the ward councilor's office of Ward no. 1.

v. Commercial Activity

At present, commercial activity and density of population are very low in this ward. Only 1.83 acres of land has been proposed as neighborhood market for this purpose. *Table 3.1.2* shows the existing and proposed commercial land use of Ward no. 1.

vi. 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 37.82 acres of land and about 5.33% of the total area that is more workable for this ward.

vii. Community Facilities

Land for community facilities will be 1.90 acre (0.27%) whereas present land for this purpose in this ward is also same. A community center of 0.46 acres has been proposed here beside proposed ward councilor's office.

viii. Agricultural Area

The total area under this use in ward 01 has been estimated about 434.06 acres of land covering 61.13% of the total land of this ward.

ix. Open Space & Recreational Facilities

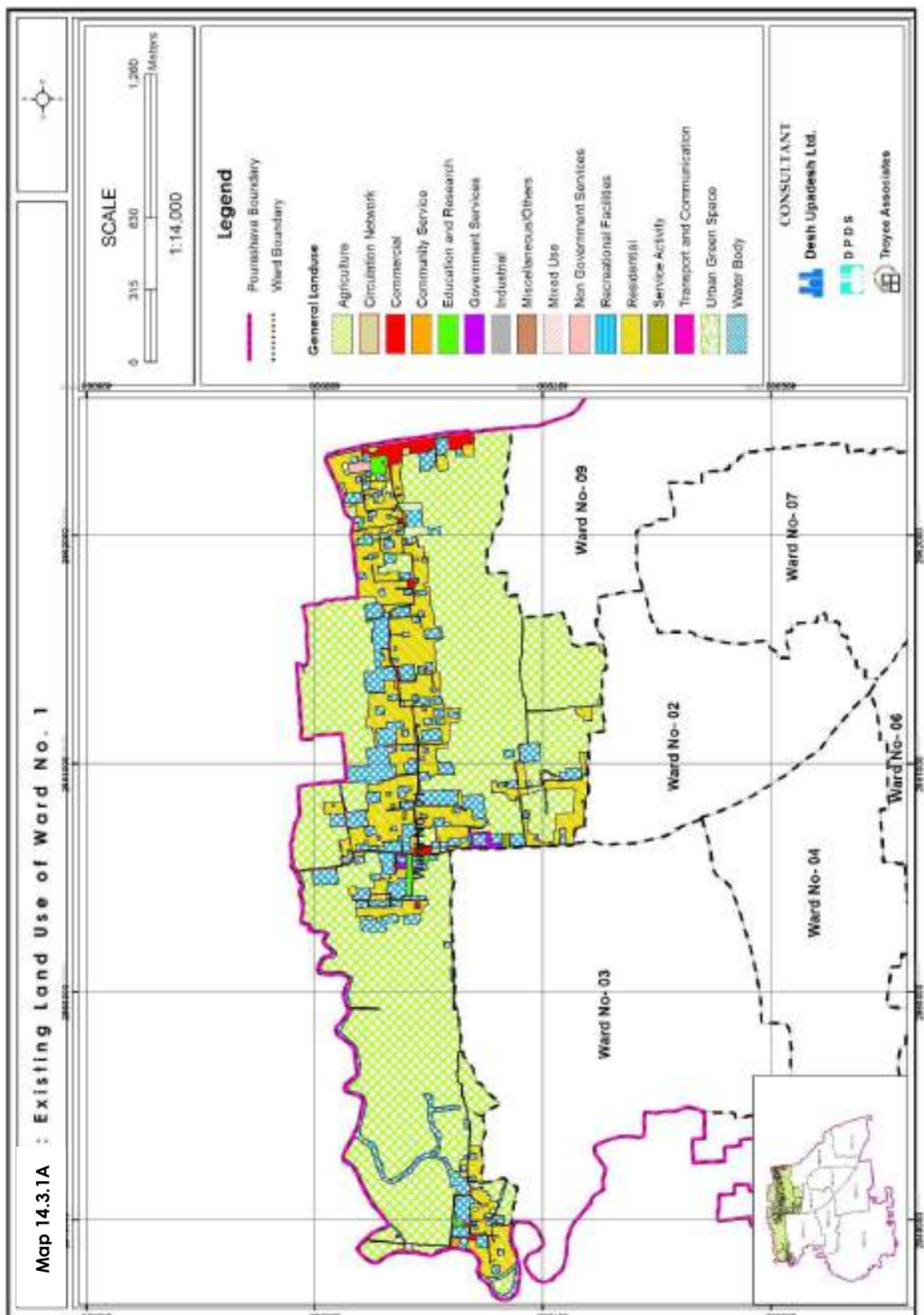
Land for open space will be 10.65 acres (1.50%) which includes open recreational facilities like playground, Neighborhood Park, green belt along the lake and khals.

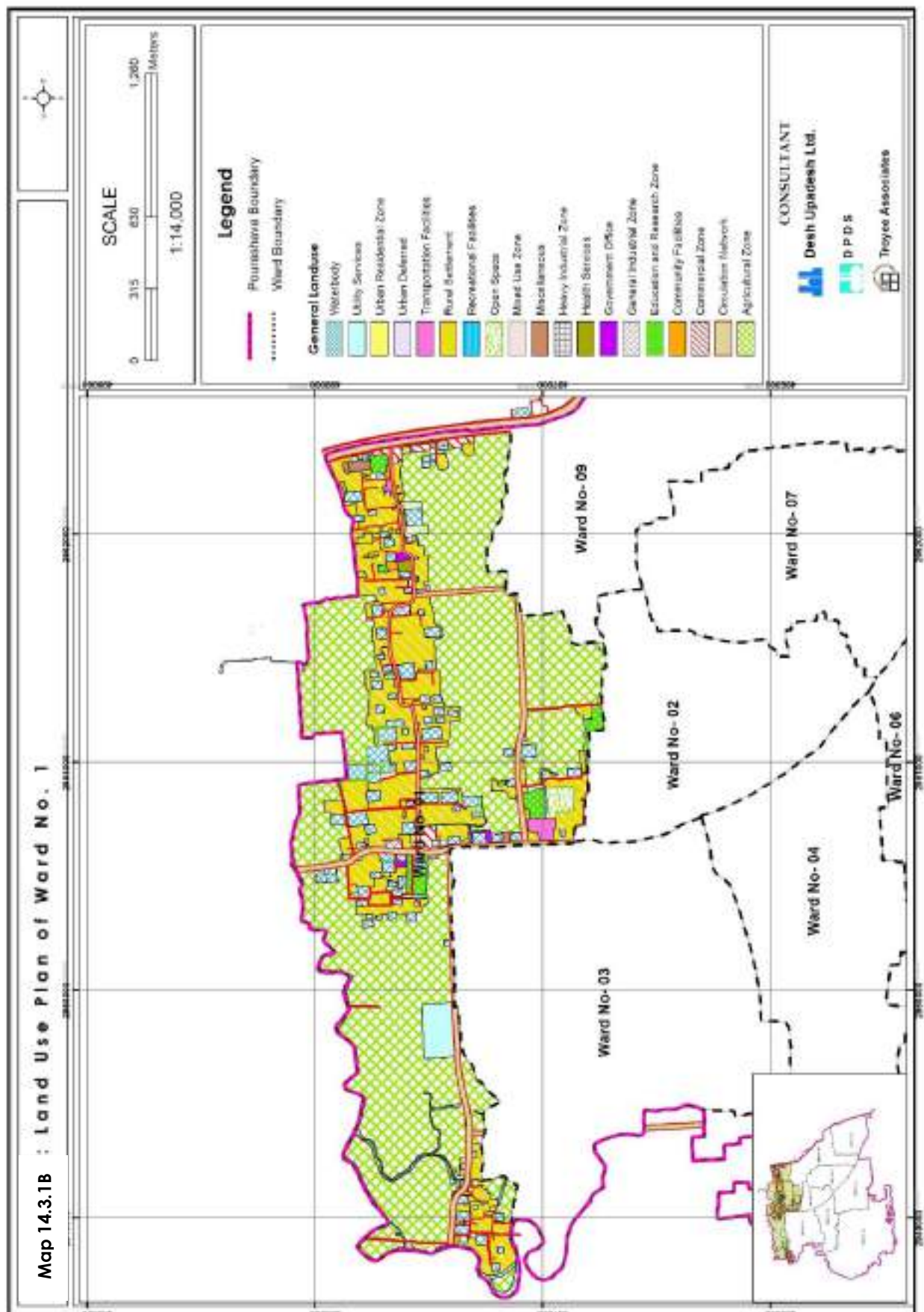
x. Water bodies

The proposed retention area (Water bodies) covers almost 61.71 acres of land which covers 8.69% of the total ward area. All of the existing water bodies like khal, river, pond, ditch etc have tried to preserve as possible.

xi. Utility Services Zone

A total of 8.15 acres of land covering 1.15% of total land is earmarked as Utility Services zone at Ward no. 01. A solid waste dumping site and a waste transfer station has proposed in this ward.





14.3.1.3.3 Proposed Road Infrastructure Development

A total of 13.45 km of road development has been proposed in first ward action plan for Ward no. 01 of Chandanaish Pourashava. Length of the access road (local road) will be 2.91 km and width of these roads will be 10 ft which covers 21.64% of total road network development proposal. Total length of tertiary (20 ft and 30 ft) and secondary road (40 ft and 60 ft) will be 4.18 km and 2.30 km respectively. The rest 4.05 km primary road will be developed and its width will be 80-160 ft at different locations. The detailed scenario of road network development proposal is given in *Table 3.1.3 A and 3.1.3 B (Map 3.1C)*.

Table 14.3.1C: Summary of Road Network Proposal at Ward no. 01

Road Width (Feet)	Type of Road	Total		New Road		Road Widening	
		Length (km)	%	Length (km)	%	Length (km)	%
10	Local Road (as it is)	2.91	21.64	-	-	-	-
20	Tertiary Road	4.18	31.09	0.54	54.33	3.64	38.14
30		-	-	-	-	-	-
40	Secondary Road	1.90	14.13	-	-	1.90	19.91
60		0.40	2.97	0.40	40.24	-	0.00
80	Primary Road	3.61	26.88	0.05	5.43	3.56	37.30
160		0.44	3.29	-	-	0.44	4.64
Total		13.45	100.00	0.99	100.00	9.54	100.00

Source: Prepared by Consultants

A total of 9.54 km of road widening has been proposed for this ward. Among these, 3.64 km, 1.90 km and 4.00 km is respectively for tertiary, secondary and primary road.

Table 14.3.1D: Phasing of Road Network Proposal at Ward no. 01

Road ID	Road Type	Proposal	Width (ft)	Phasing
PR-115	Primary Road	Widening	80	First Phase
PR-469	Primary Road	Widening	160	Second Phase
PR-483	Primary Road	Widening	80	Second Phase
PR-484	Primary Road	New Road	80	Third Phasing
PR-485	Primary Road	Widening	80	Third Phasing
SR-107	Secondary Road	Widening	40	First Phase
SR-464	Secondary Road	New Road	60	First Phase
TR-32	Tertiary Road	Widening	20	Third Phasing
TR-33	Tertiary Road	New Road	20	Third Phasing
TR-34	Tertiary Road	Widening	20	Third Phasing
TR-467	Tertiary Road	Widening	20	Second Phase
TR-470	Tertiary Road	Widening	20	Third Phasing
TR-474	Tertiary Road	Widening	20	Third Phasing
TR-475	Tertiary Road	Widening	20	Second Phase
TR-477	Tertiary Road	Widening	20	Second Phase
TR-60	Tertiary Road	Widening	20	Second Phase
TR-63	Tertiary Road	Widening	20	Third Phasing
TR-64	Tertiary Road	Widening	20	Third Phasing
TR-65	Tertiary Road	Widening	20	Third Phasing
TR-66	Tertiary Road	New Road	20	Third Phasing
TR-8	Tertiary Road	Widening	20	Third Phasing
TR-9	Tertiary Road	Widening	20	Third Phasing

14.3.1.3.4 Proposed Drainage Infrastructure Development

Existing drainage is mostly depending on natural drainage facilities. The proposed drainage facilities will be developed based on these natural channels. The primary drain (4.59 km) for the ward which will be connected by 1.90 km secondary drain and 2.76 km tertiary drain. *Table 3.1.4* shows the detail Drainage Network of ward no. 01 in Chandanaish Pourashava (*Map 3.1D*).

Table14. 3.1E: Summary of Drainage Network Proposal at Ward no. 01

Drain Hierarchy	Drain Width (Meter)	Proposed Drain ID	Length (Km)
Primary Drain	1.50	PD-110	0.81
	1.50	PD-114	1.00
	1.50	PD-115	1.08
	1.50	PD-119	1.24
	1.50	PD-122	0.40
	1.50	PD-123	0.06
Sub-Total			4.59
Secondary Drain	1.00	SD-106	1.90
Sub-Total			1.90
Tertiary Drain	0.50	TD-1	0.27
	0.50	TD-2	0.02
	0.50	TD-4	0.14
	0.50	TD-33	0.24
	0.50	TD-34	0.31
	0.50	TD-35	0.34
	0.50	TD-79	0.41
	0.50	TD-80	0.64
	0.50	TD-82	0.11
	0.50	TD-3	0.26
	0.50	TD-51	0.02
Sub-Total			2.76
Grand Total			9.25

Source: Prepared by Consultants

14.3.1.3.5 Priority Tasks

The following priorities have been identified after the public consultation meeting at Chandanaish Pourashava. Among these tasks, activities under Priority-1 to be executed by first 5 years, actions under Priority-2 to be done by next 5 years and tasks under Priority-3 to be accomplished by last 10 years.

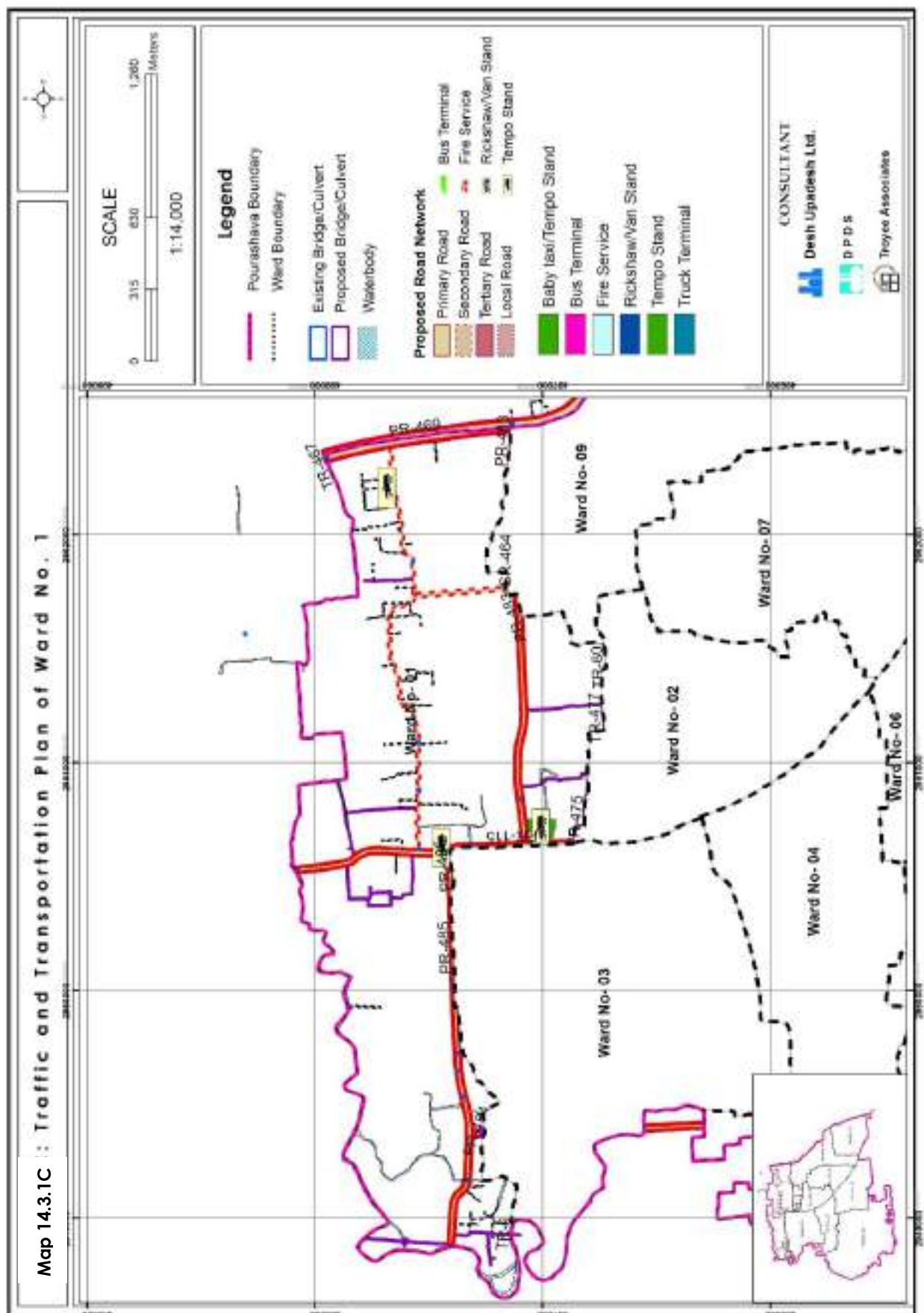
Table 14.3.1F: List of Priority Tasks has to be initiated by the Chandanaish Pourashava

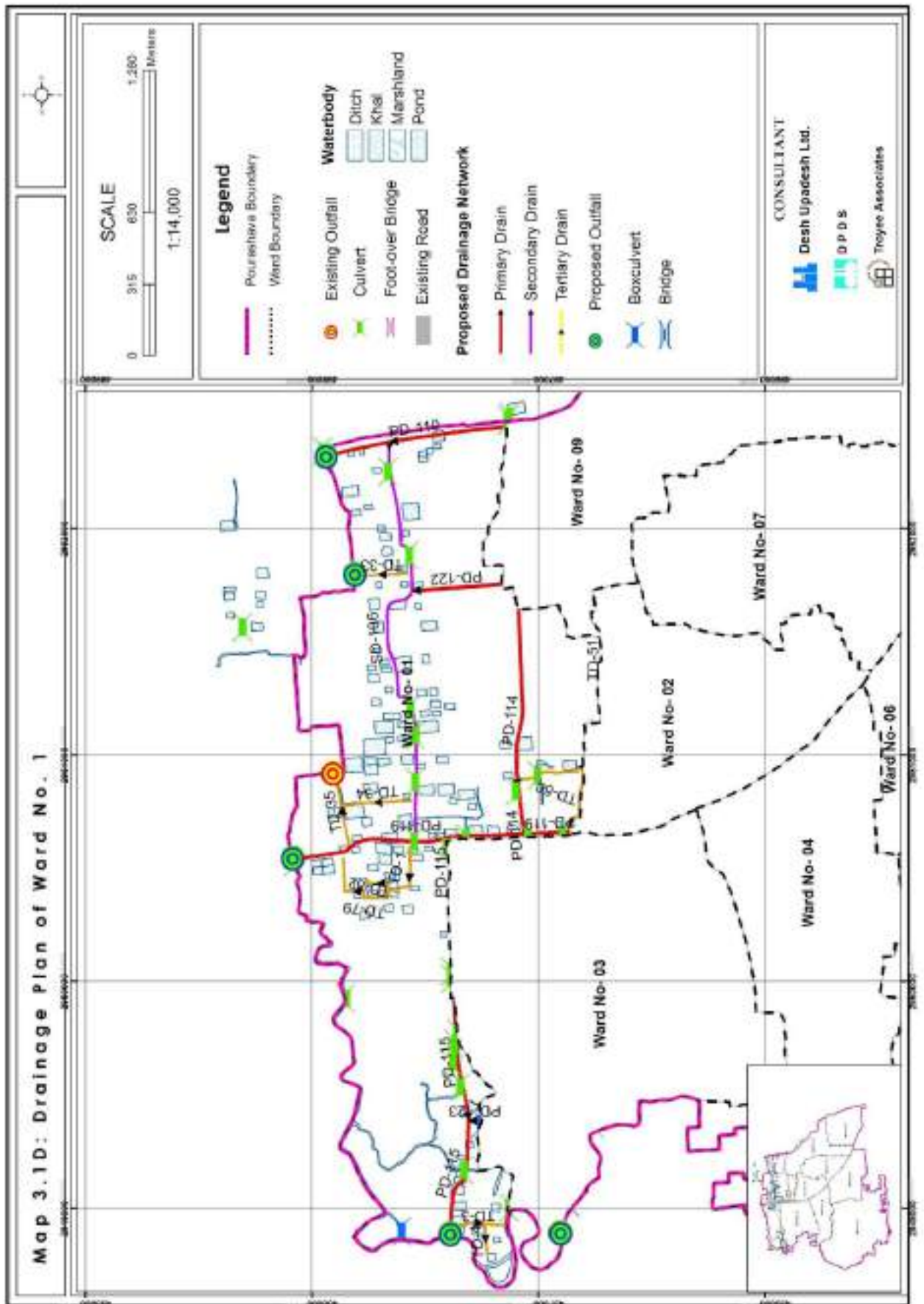
Priority-1		Priority-2		Priority-3	
Type of Construction	ID	Type of Construction	ID	Type of Construction	ID
Road Development	PR-115, SR-109, SR-466	Road Development	PR-469, PR-483, TR-60, TR-467, TR-475, TR-477	Road Development	LR-117, LR-118, LR-119, LR-120, LR-121, LR-122, LR-123, LR-124, LR-125, LR-126, LR-127, LR-128, LR-129, LR-130, LR-131, LR-132, LR-133, LR-134, LR-135, LR-136, LR-137, LR-138, LR-139, LR-140, LR-141, LR-142, LR-143, LR-144, LR-145, LR-146, LR-147, LR-148

Priority-1		Priority-2		Priority-3	
Type of Construction	ID	Type of Construction	ID	Type of Construction	ID
					LR-450, LR-455 LR-456, PR-484. PR-485, TR-8, TR-9, TR-32, TR-33, TR-34, TR-63, TR-64, TR-65, TR-66, TR-470, TR-474
Drain	PD-110, PD-114 PD-115, PD-119 PD-122, PD-123	Drain	SD-106	Drain	TD-1, TD-2, TD-4, TD-33, TD-34, TD-35, TD-79, TD-80, TD-82, TD-3, TD-51
Other Facilities	Tempo Stand, Waste Transfer Station, Community Clinic, Community Centre, Ward Office	Other Facilities	Tempo Stand, Solid Waste Disposal Site, Primary School	Other Facilities	Neighborhood Market, High School, Library, Tempo Stand

Source: Prepared by consultants'

Plot wise specific development proposal is attached in *Annex-7*, list of road inventory and drainage inventory is given in *Annex-8 and Annex-9* respectively.





14.3.2: Action Plan for Ward 02

14.3.2.1 Criteria for the Plan Proposal

Demography

Ward No. 2 is located on the north-east part of the Pourashava. It has moderate density of population. As per the pourashava population census data of 2011, the Ward no. 02 had a population of 7892 persons. Family size was 6; sex ratio was same with male and female. Population projection shows 8502 population for the year 2016. For the same year, it has a gross density of about 39 persons per acre and it will be 49 persons per acre in 2031. *Table 3.2.1* shows the detail.

Table 14.3.2A: Population Statistics of Ward no. 02

Item	Year				
	2011	2016	2021	2026	2031
Area (Acre)	216.74	216.74	216.74	216.74	216.74
Population	7,892	8,502	9,159	9,867	10,629
Population Density per acre	36	39	42	46	49

Source: Chandanaish Pourashava, 2011

14.3.2.2 Critical Issues and Opportunities of the ward

Critical Issues

Ward No. 2 is the north-eastern part of the Chandanaish Pourashava with characteristics of some rural urban and mostly predominant urban activities. It has the following critical issues,

- Lack of basic facilities and infrastructures required for an urban area.
- There is no systematic drainage and solid waste management facilities.
- Lack of adequate road.
- There is no water supply network at this ward.
- There is lack of commercial, open space, recreational, educational and social gathering facilities.

Development Opportunities

Due to low density of population and having external road linkage by Chittagong-Cox's Bazar highway i.e. Arakan Road creates development opportunity of this ward. The development opportunities are as follows,

- From environmental point of view, low density population can create a very livable environment for the area with respect to ventilation, use of road and other basic services.
- Some khals inside of Chandanaish Pourashava plays an important role in drainage system.
- Chittagong-Cox's Bazar highway i.e. Arakan Road also plays pivotal role to develop different facilities due to tourist attracting zone of Cox's Bazar, Teknaf and Saint Martin as well as Landport of Teknaf.

14.3.2.3 Proposals and Plan for Ward no. 02

14.3.2.3.1 Review of Existing Land Use

Ward no. 02 is mostly urban but only a few areas rural in character. Out of total 216.73 acres of land of this ward, 72.51 acres of land i.e. 33.46% is reserved for agriculture. In existing land uses, both the urban residential and rural homestead has been considered as residential use as a whole. The residential use with 77.83 acres, occupies 35.91% of total ward land, water bodies 17.47%, circulation network 3.39%, commercial activity 2.63% and education and research 1.32%. Only 1.72% of land is used as government service. There is only 2.34% land for urban green space and recreational facilities. No other notable type of land uses are found in this ward. Table 3.2.2 shows the existing and proposed land use pattern of the ward (Map 3.2A and Map 3.2B).

14.3.2.3.2 Proposed Land Use Zoning

The category wise proposals are presented here. Table 3.2.2 shows the amount of land existing and proposed uses in Ward No. 2.

i. Urban Residential Zone

At present around 77.83 acres land is occupied by urban residential use as a whole. In Ward Action Plan of Ward 02, 87.49 acre of land has been earmarked for urban residential use which will occupy 40.36% of the total land in Ward 02.

ii. Rural Settlement

As this Ward is predominantly urban in character, only 0.03 acres (0.01%) of land is proposed for rural settlement up to the year 2031.

Table 14.3.2B: Summary of the Existing Land uses and Proposed Land uses

Sl. No.	Existing Landuse	Area in Acres	%	Sl. No.	Proposed General Landuse	Area in Acres	%
1	Residential	77.83	35.91	1	Urban Residential Area	87.49	40.36
				2	Rural Settlement	0.03	0.01
2	Education and Research	2.86	1.32	3	Education and Research	9.38	4.33
3	Governmental Services	3.73	1.72	4	Governmental Office	4.53	2.09
4	Non Government Services	0.04	0.02	5	Health Services	-	-
5	Commercial Activity	5.71	2.63	6	Commercial Zone	9.45	4.36
6	Manufacturing and Processing Activity	-	-	7	General Industry	-	-
7	Mixed Use	0.08	0.04	8	Mixed Use	0.06	0.03
8	Circulation Network	7.34	3.39	9	Circulation Network	18.73	8.64
9	Transport and Communication	-	-	10	Transport and Communication	0.46	0.21
10	Service Activity	1.67	0.77	11	Utility Services	0.42	0.19
11	Community Facilities	2.03	0.94	12	Community Facilities	3.44	1.59
12	Recreational Facilities	0.30	0.14	13	Recreational Facilities	0.27	0.13
13	Restricted Area	-	-	14	Restricted Area	-	-
14	Agriculture	72.51	33.46	15	Agriculture	1.85	0.85
15	Urban Green Space	4.77	2.20	16	Urban Green/ Open Space	7.77	3.58
16	Water Bodies	37.86	17.47	17	Water Bodies	21.34	9.85
17	Vacant Land	-	-	18	Historical & Heritage	-	-
18	Forest	-	-	19	Forest	-	-
19	Miscellaneous	-	-	20	Miscellaneous	0.01	0.01
				21	Urban Deferred	51.52	23.77
Total		216.73	100	Total		216.73	100

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

iii. Education and Research

In Ward Action Plan, 2 colleges, 1 madrasa and 2 nursery schools is proposed which comprises an area of 6.46 acres.

iv. Government office

In Ward No. 2, only 4.53 acres of land (2.09% of total land) has been proposed for govt. services. However, no ward councilor's office or ward center has been proposed in ward no. 2. The Table 3.2.2 has shown in detail landuse.

v. Commercial Activity

At present, commercial activity and density of population are low in this ward. Only 3.62 acres of land has been proposed as a wholesale market and a corner shop for this purpose.

vi. 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 18.73 acres of land and about 8.64% of the total area that is more workable for this ward.

vii. Community Facilities

Land for community facilities will be 3.44 acre (1.59%) whereas present land for this purpose in this ward is 2.03 acres (0.94%). A central eidgah of 1.27 acres has been proposed here near the boundary of ward no. 1 and 9. Map 3.2 shows the location of proposed central eidgah.

viii. Agricultural Area

The total area under this use in Ward 02 has been estimated only 1.85 acres of land covering 0.85% of the total land of this ward.

ix. Open Space & Recreational Facilities

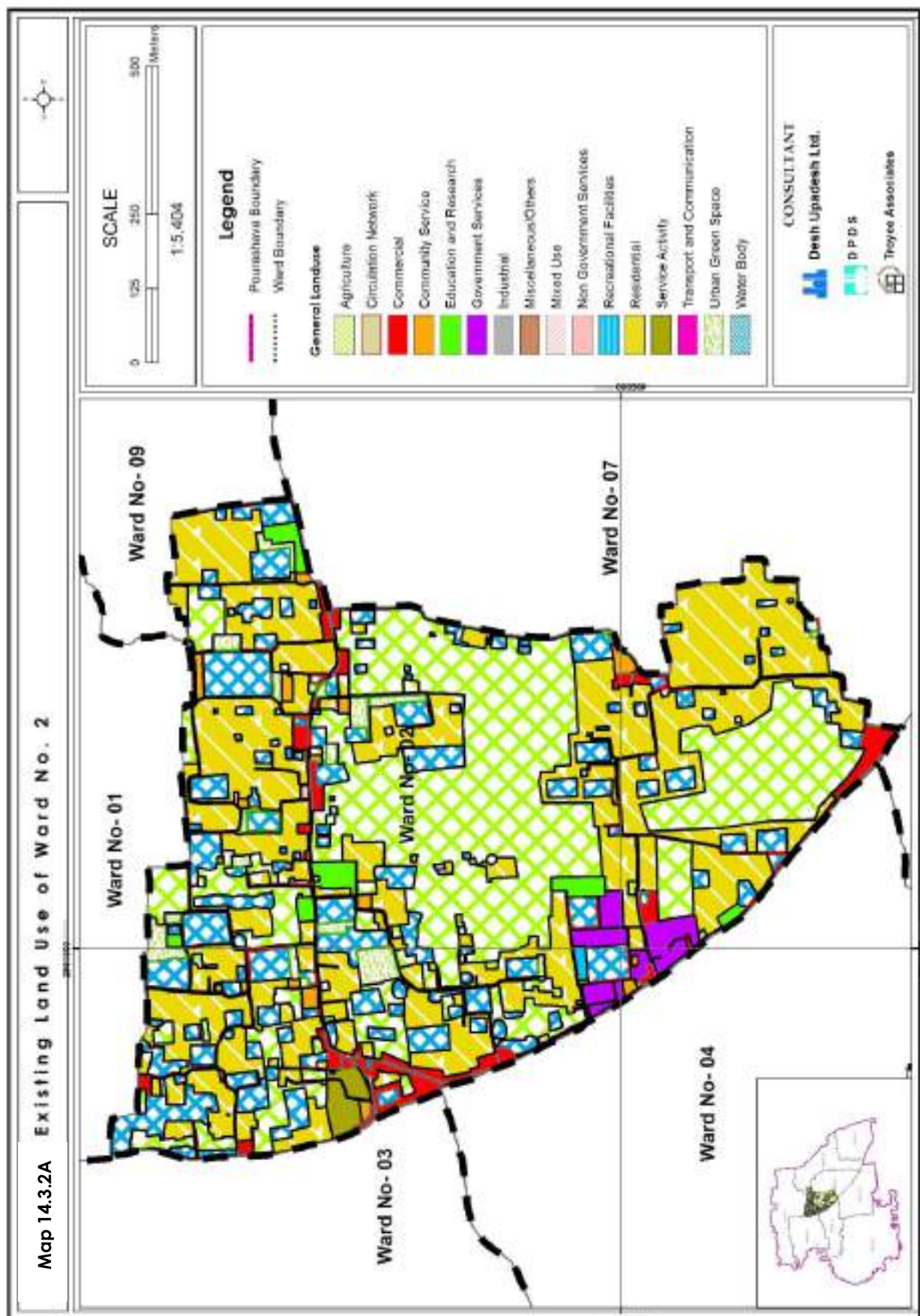
Land for open space will be 8.04 acres (3.71%) which includes open recreational facilities like playground and park.

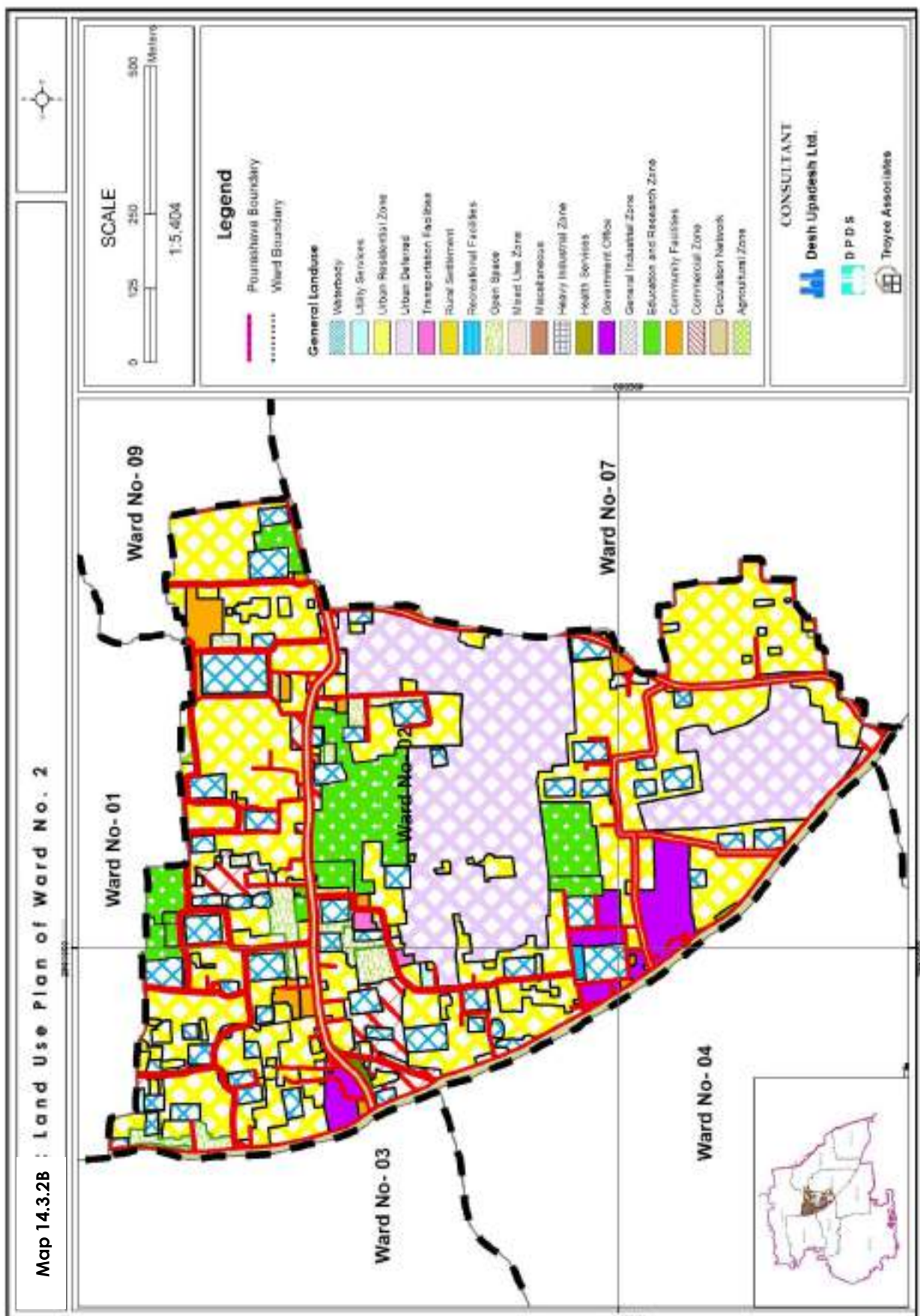
x. Water bodies

The proposed retention area (Water bodies) covers almost 21.34 acres of land which covers 9.85% of the total ward area. All of the existing water bodies like khal, river, pond, ditch etc have tried to preserve as possible.

xi. Utility Services Zone

A total of 8.15 acres of land covering 1.15% of total land is earmarked as Utility Services zone at Ward no. 02. A solid waste dumping site and a waste transfer station has proposed in this ward. Map 3.2B shows the proposed location of utilities of Ward No. 2.





14.3.2.3.3 Proposed Road Infrastructure Development

A total of 9.42 km of road development has been proposed in first ward action plan for Ward no. 02 of Chandanaish Pourashava. Length of the access road (local road) will be 2.16 km and width of these roads will be 10 ft which covers 22.93% of total road network development proposal. Total length of tertiary (20 ft and 30 ft) and secondary road (40 ft) will be 5.37 km and 0.99 km respectively. The rest 0.90 km primary road will be developed and its width will be 80 ft. The detailed scenario of road network development proposal is given in *Table 3.2.3 A and 3.2.3 B (Map 3.2C)*.

Table 14.3.2C: Summary of Road Network Proposal at Ward no. 02

Road Width (Feet)	Type of Road	Total		New Road		Road Widening	
		Length (km)	%	Length (km)	%	Length (km)	%
10	Local Road (as it is)	2.16	22.93	-	-	-	-
20	Tertiary Road	4.61	48.93	-	-	4.61	63.48
30		0.76	8.07	-	-	0.76	10.47
40	Secondary Road	0.99	10.51	-	-	0.99	13.63
60		-	-	-	-	-	-
80	Primary Road	0.90	9.57	-	-	0.90	12.42
160		-	-	-	-	-	-
Total		9.42	100.00	-	-	7.26	100.00

Source: Prepared by Consultants

Table 14.3.2D: Phasing of Road Network Proposal at Ward no. 02

Road ID	Road Type	Proposal	Width (ft)	Phasing
TR-13	Tertiary Road	Widening Road	20	Third Phasing
TR-14	Tertiary Road	Widening Road	20	Second Phase
TR-15	Tertiary Road	Widening Road	20	Second Phase
TR-16	Tertiary Road	Widening Road	20	Third Phasing
TR-17	Tertiary Road	Widening Road	20	Third Phasing
TR-35	Tertiary Road	Widening Road	20	Second Phase
TR-36	Tertiary Road	Widening Road	20	Second Phase
TR-37	Tertiary Road	Widening Road	20	Second Phase
TR-475	Tertiary Road	Widening Road	20	Second Phase
TR-477	Tertiary Road	Widening Road	20	Second Phase
TR-58	Tertiary Road	Widening Road	20	Second Phase
TR-59	Tertiary Road	Widening Road	20	Second Phase
TR-60	Tertiary Road	Widening Road	20	Second Phase
TR-61	Tertiary Road	Widening Road	20	Third Phasing
TR-62	Tertiary Road	Widening Road	20	Third Phasing
TR-80	Tertiary Road	Widening Road	20	Second Phase
TR-96	Tertiary Road	Widening Road	30	Second Phase
SR-106	Secondary Road	Widening Road	40	First Phase
PR-115	Primary Road	Widening Road	80	First Phase

A total of 7.26 km of road widening has been proposed for this ward. Among these, 5.37 km, 0.99 km and 0.90 km is respectively for tertiary, secondary and primary road.

3.2.3.4 Proposed Drainage Infrastructure Development

Existing drainage is mostly depending on natural drainage facilities. The proposed drainage facilities will be developed based on these natural channels. The primary drain (1.57 km) for the ward which will be connected by 0.89 km secondary drain and 4.53 km tertiary drain. *Table 3.2.4* shows the detail Drainage Network of ward no. 02 in Chandanaish Pourashava (*Map 3.2D*).

Table 14.3.2E: Summary of Drainage Network Proposal at Ward no. 02

Drain Hierarchy	Drain Width (Meter)	Proposed Drain ID	Length (Km)
Primary Drain	1.50	PD-119	1.57
Sub-Total			1.57
Secondary Drain	1.00	SD-105	0.89
Sub-Total			0.89
Tertiary Drain	0.50	TD-32	0.55
	0.50	TD-36	0.40
	0.50	TD-37	0.25
	0.50	TD-38	0.15
	0.50	TD-50	0.23
	0.50	TD-52	0.16
	0.50	TD-69	0.30
	0.50	TD-81	0.13
	0.50	TD-16	0.33
	0.50	TD-49	0.25
	0.50	TD-51	0.48
	0.80	TD-84	0.29
	0.80	TD-85	0.30
	0.80	TD-86	0.24
	0.80	TD-92	0.47
Sub-Total			4.53
Grand Total			6.99

Source: Prepared by Consultants

14.3.2.3.5 Priority Tasks

The following priorities have been identified after the public consultation meeting at Chandanaish Pourashava. Among these tasks, activities under Priority-1 to be executed by first 5 years, actions under Priority-2 to be done by next 5 years and tasks under Priority-3 to be accomplished by last 10 years.

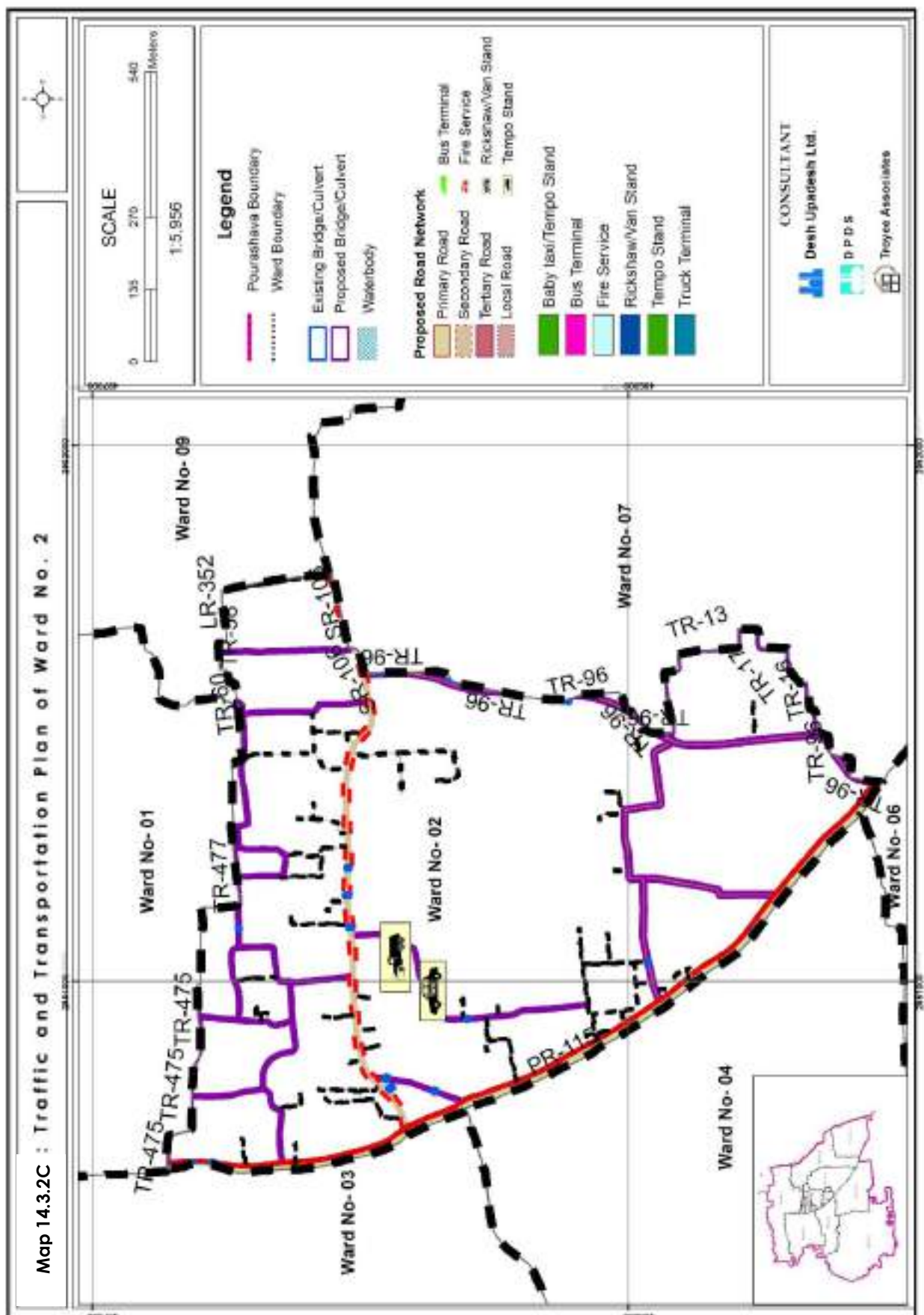
Table 14.3.2F: List of Priority Tasks has to be initiated by the Chandanaish Pourashava

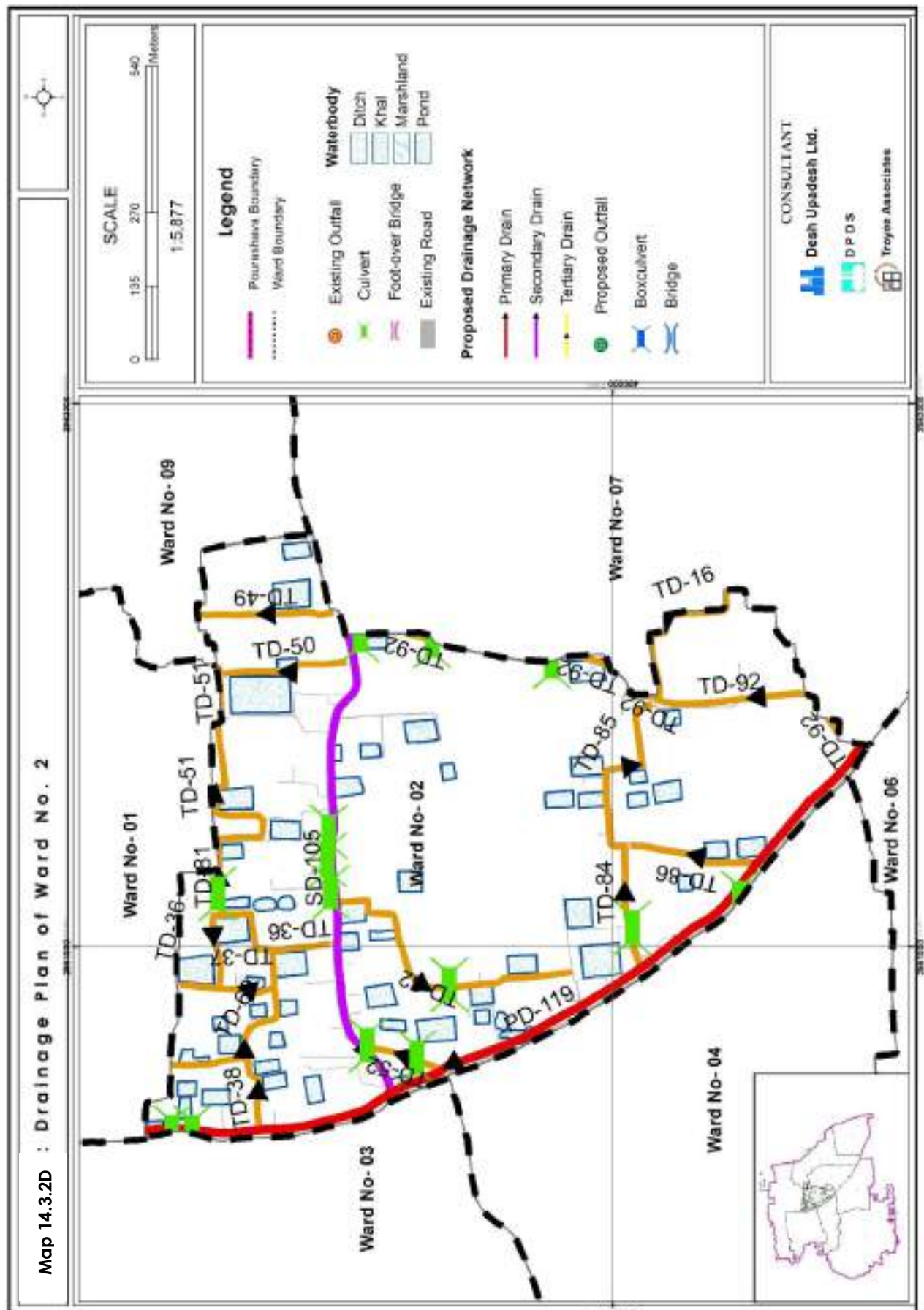
Priority-1		Priority-2		Priority-3	
Type of Construction	ID	Type of Construction	ID	Type of Construction	ID
Road Development	PR-115, SD-108	Road Development	TR-14, TR-15 TR-35, TR-36 TR-37, TR-58 TR-59, TR-60 TR-80, TR-96 TR-475, TR-477	Road Development	LD-116, LD-307 LD-308, LD-309 LD-310, LD-311 LD-312, LD-313 LD-314, LD-315 LD-316, LD-317 LD-318, LD-319 LD-320, LD-321 LD-322, LD-323 LD-324, LD-325 LD-326, LD-327 LD-328, LD-329 LD-330, LD-331 LD-332, LD-333 LD-334, LD-335 LD-336, LD-337 LD-338, LD-339 LD-340, LD-341 LD-342, LD-343 LD-344, LD-345 LD-348, LD-349 LD-350, LD-354 LD-443, TR-13 TR-16, TR-17 TR-61, TR-62
Drain	PD-119	Drain	SD-105	Drain	TD-32, TD-36

Priority-1		Priority-2		Priority-3	
Type of Construction	ID	Type of Construction	ID	Type of Construction	ID
					TD-37, TD-38 TD-50, TD-52 TD-69, TD-81 TD-84, TD-85 TD-86, TD-16 TD-49, TD-51 TD-92
Other Facilities	Central Eidgah, College, Park, Rickshaw/Van Stand, Tempo Stand, Waste Transfer Station, Wholesale Market	Other Facilities	Waste Transfer Station, Nursery School Madrasha	Other Facilities	Waste Transfer Station, Nursery School, Madrasha, Park, Corner Shop

Source: Prepared by consultants'

Plot wise specific development proposal is attached in *Annex-7*, list of road inventory and drainage inventory is given in *Annex-8 and Annex-9* respectively.





14.3.3: Action Plan for Ward 03

14.3.3.1 Criteria for the Plan Proposal

Demography

Ward no. 3 is located on the north-west part of the Pourashava. As per the pourashava population census data of 2011, the Ward No. 03 had a population of 7163 persons. Family size was 6; sex ratio was same with male and female. Population projection shows 7717 population for the year 2016. For the same year, it has a gross density of about 17 persons per acre and it will be 21 persons per acre in 2031. *Table 3.3.1* shows the detail.

Table 14.3.3A: Population Statistics of Ward No. 03

Item	Year				
	2011	2016	2021	2026	2031
Area (Acre)	451.58	451.58	451.58	451.58	451.58
Population	7,163	7,717	8,313	8,955	9,648
Population Density per acre	16	17	18	20	21

Source: Chandanaish Pourashava, 2011

14.3.3.2 Critical Issues and Opportunities of the ward

Critical Issues

Ward no. 3 is the north-west part of the Chandanaish Pourashava with characteristics of some urban and mostly predominant rural activities. It has the following critical issues,

- Lack of basic facilities and infrastructures required for an urban area.
- There is no systematic drainage and solid waste management facilities.
- Lack of adequate road.
- There is no water supply network at this ward.
- There is lack of commercial, open space, recreational, educational and social gathering facilities.

Development Opportunities

Due to low density of population and having external road linkage of the pourashava by Chittagong-Cox's Bazar highway i.e. Arakan Road creates development opportunity of this ward. The development opportunities are as follows,

- From environmental point of view, low density population can create a very livable environment for the area with respect to ventilation, use of road and other basic services.
- Some khals inside of Chandanaish Pourashava plays an important role in drainage system.
- Chittagong-Cox's Bazar highway i.e. Arakan Road also plays pivotal role to develop different facilities due to tourist attracting zone of Cox's Bazar, Teknaf and Saint Martin as well as Landport of Teknaf.

14.3.3.3 Proposals and Plan for Ward No. 03

14.3.3.3.1 Review of Existing Land Use

Ward No. 03 is mostly rural but only a few areas urban in character. Out of total 451.59 acres of land of this ward, around 322.16 acres of land i.e. 71.34% is reserved for agriculture. In existing land uses, both the urban residential and rural homestead has been considered as residential use as a whole. The residential use with 56.13 acres, occupies 12.43% of total land, water bodies 12.47% and circulation network 1.06%. But no land is used as government service. There is only 0.32% land for urban green space and recreational facilities. No other notable type of land uses are found in this ward. *Table 3.3.2* shows the existing and proposed land use pattern of the ward (*Map 3.3A and Map 3.3B*).

14.3.3.3.2 Proposed Land Use Zoning

The category wise proposals are presented here.

i. Urban Residential Zone

At present around 56.13 acres land is occupied by urban residential use as a whole. In Ward Action Plan of Ward 03, around 48.01 acre of land has been earmarked for urban residential use which will occupy 10.63% of the total land in Ward 03.

ii. Rural Settlement

As this Ward is predominantly rural in character, a large portion of land like 9.19 acres (9.19%) of land is proposed for rural settlement up to the year 2031. *Table 3.3.2* shows the details about the existing and proposed land uses of Ward no. 3.

Table 14.3.3B: Summary of the Existing Land uses and Proposed Land uses

Sl. No.	Existing Landuse	Area in Acres	%	Sl. No.	Proposed General Landuse	Area in Acres	%
1	Residential	56.13	12.43	1	Urban Residential Area	48.01	10.63
				2	Rural Settlement	9.19	2.03
2	Education and Research	1.79	0.40	3	Education and Research	1.41	0.31
3	Governmental Services	-	-	4	Governmental Office	-	-
4	Non Government Services	-	-	5	Health Services	1.81	0.40
5	Commercial Activity	4.10	0.91	6	Commercial Zone	3.22	0.71
6	Manufacturing and Processing Activity	-	-	7	General Industry	-	-
7	Mixed Use	0.09	0.02	8	Mixed Use	0.03	0.01
8	Circulation Network	4.79	1.06	9	Circulation Network	18.01	3.99
9	Transport and Communication	0.21	0.05	10	Transport and Communication	0.17	0.04
10	Service Activity	2.34	0.52	11	Utility Services	0.12	0.03
11	Community Facilities	2.20	0.49	12	Community Facilities	2.19	0.48
12	Recreational Facilities	-	-	13	Recreational Facilities	-	-
13	Restricted Area	-	-	14	Restricted Area	-	-
14	Agriculture	322.16	71.34	15	Agriculture	327.34	72.47
15	Urban Green Space	1.43	0.32	16	Urban Green/ Open Space	12.08	2.67
16	Water Bodies	56.33	12.47	17	Water Bodies	28.08	6.22
17	Vacant Land	-	-	18	Historical & Heritage	-	-
18	Forest	-	-	19	Forest	-	-
19	Miscellaneous	0.02	0.00	20	Miscellaneous	0.01	0.00
				21	Urban Deferred	-	-
Total		451.59	100	Total		451.59	100

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

iii. Education and Research

In Ward Action Plan, one high school is proposed along with a play ground which comprises an area of 0.61 acres.

iv. Government office

In ward no. 3, no land for govt. office has been proposed.

v. Commercial Activity

At present, commercial activity and density of population are very low in this ward. Only 3.22 acres of land has been proposed for this purpose. *Table 3.3.2* shows the existing and proposed commercial land use of Ward no. 3.

vi. 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 18.01 acres of land and about 3.99% of the total area that is more workable for this ward.

vii. Community Facilities

Land for community facilities will be 2.19 acre (0.48%) whereas present land for this purpose in this ward is almost same.

viii. Agricultural Area

The total area under this use in Ward 03 has been estimated about 327.34 acres of land covering 72.47% of the total land of this ward.

ix. Open Space & Recreational Facilities

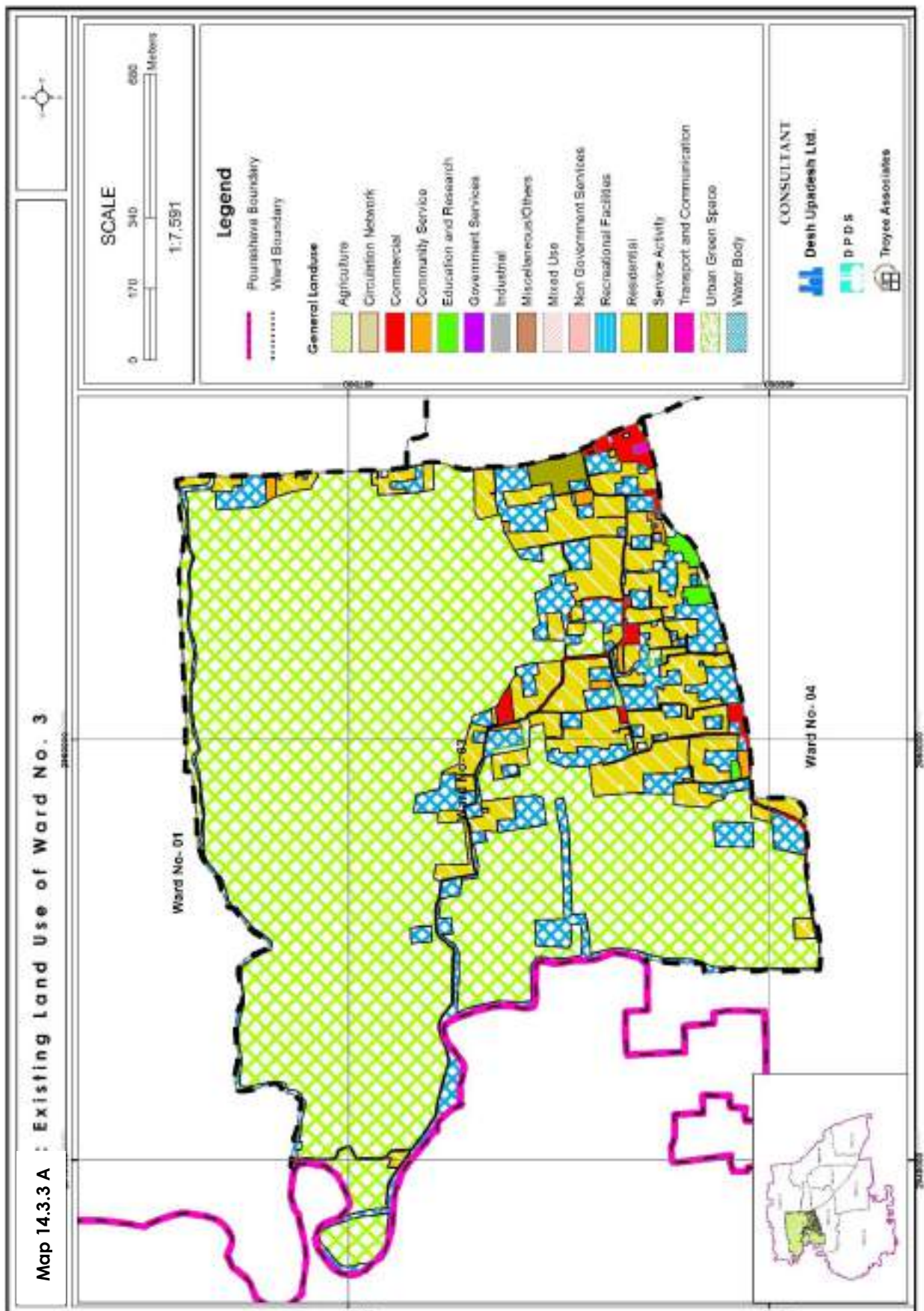
Land for open space will be 12.08 acres (2.67%) which includes open recreational facilities like playground and park.

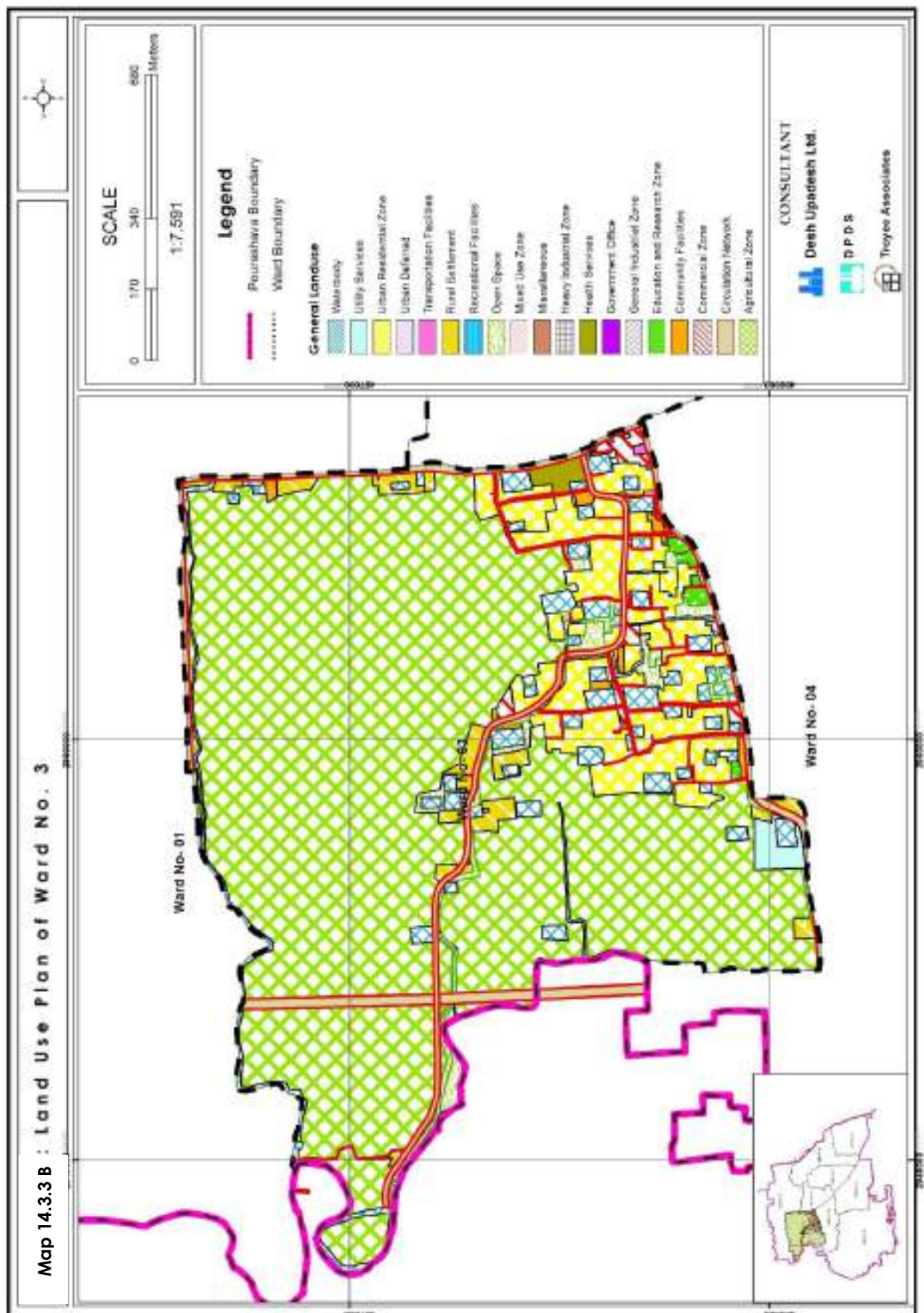
x. Water bodies

The proposed retention area (Water bodies) covers almost 28.08 acres of land which covers 6.22% of the total ward area. All of the existing water bodies like khal, river, pond, ditch etc have tried to preserve as possible.

xi. Utility Services Zone

A total of 0.12 acres of land covering 0.03% of total land is earmarked as Utility Services zone at Ward No. 03. A waste transfer station and a fire service station have been proposed in this ward.





14.3.3.3.3 Proposed Road Infrastructure Development

A total of 7.80 km of road development has been proposed in first ward action plan for Ward No. 03 of Chandanaish Pourashava. Length of the access road (local road) will be 1.68 km and width of these roads will be 10 ft which covers 21.54% of total road network development proposal. Total length of tertiary (20 ft) and secondary road (40 ft and 60 ft) will be 1.78 km and 2.85 km respectively. The rest 1.49 km primary road will be developed and its width will be 80 ft. The detailed scenario of road network development proposal is given in *Table 3.3.3 A and 3.3.3 B (Map 3.3C)*.

Table 14.3.3C: Summary of Road Network Proposal at Ward No. 03

Road Width (in Feet)	Type of Road	Total		New Road		Road Widening	
		Length (km)	%	Length (km)	%	Length (km)	%
10	Local Road (as it is)	1.68	21.54	-	-	-	-
20	Tertiary Road	1.78	22.82	-	-	1.78	32.78
30		-	-	-	-	-	-
40	Secondary Road	2.13	27.31	-	-	2.13	39.23
60		0.72	9.23	-	-	0.72	13.26
80	Primary Road	1.49	19.10	0.69	100.00	0.80	14.73
160		-	-	-	-	-	-
Total		7.80	100.00	0.69	100.00	5.43	100.00

Source: Prepared by Consultants

Table 14.3.3D: Phasing of Road Network Proposal at Ward no. 03

Road ID	Road Type	Proposal	Width (ft)	Phasing
TR-38	Tertiary Road	Widening Road	20	Third Phasing
TR-39	Tertiary Road	Widening Road	20	Third Phasing
TR-40	Tertiary Road	Widening Road	20	Second Phase
TR-41	Tertiary Road	Widening Road	20	Third Phasing
TR-42	Tertiary Road	Widening Road	20	Third Phasing
TR-82	Tertiary Road	Widening Road	20	Second Phase
SR-102	Secondary Road	Widening Road	40	Second Phase
SR-103	Secondary Road	Widening Road	40	Second Phase
SR-111	Secondary Road	Widening Road	60	First Phase
PR-115	Primary Road	Widening Road	80	First Phase
PR-484	Primary Road	New Road	80	Third Phasing
PR-485	Primary Road	Widening Road	80	Third Phasing
PR-486	Primary Road	New Road	80	Third Phasing

A total of 5.43 km of road widening has been proposed for this ward. Among these, 1.78 km, 2.85 km and 0.80 km is respectively for tertiary, secondary and primary road.

14.3.3.3.4 Proposed Drainage Infrastructure Development

Existing drainage is mostly depending on natural drainage facilities. The proposed drainage facilities will be developed based on these natural channels. The primary drain (1.35 km) for the ward which will be connected by 2.25 km secondary drain and 1.75 km tertiary drain. *Table 3.3.4* shows the detail Drainage Network of Ward No. 03 in Chandanaish Pourashava (*Map 3.3D*).

Table 14.3.3E: Summary of Drainage Network Proposal at Ward No. 03

Drain Hierarchy	Drain Width (Meter)	Proposed Drain ID	Length (Km)
Primary Drain	1.50	PD-115	0.67
	1.50	PD-121	0.23
	1.50	PD-123	0.45
Sub-Total			1.35
Secondary Drain	1.00	SD-101	0.65
	1.00	SD-102	1.48
	1.00	SD-98	0.12
Sub-Total			2.25
Tertiary Drain	0.50	TD-5	0.20
	0.50	TD-6	0.52
	0.50	TD-7	0.10
	0.50	TD-72	0.27
	0.50	TD-76	0.37
	0.50	TD-77	0.22
	0.50	TD-78	0.07
Sub-Total			1.75
Grand Total			5.35

Source: Prepared by Consultants

14.3.3.3.5 Priority Tasks

The following priorities have been identified after the public consultation meeting at Chandanaish Pourashava. Among these tasks, activities under Priority-1 to be executed by first 5 years, actions under Priority-2 to be done by next 5 years and tasks under Priority-3 to be accomplished by last 10 years.

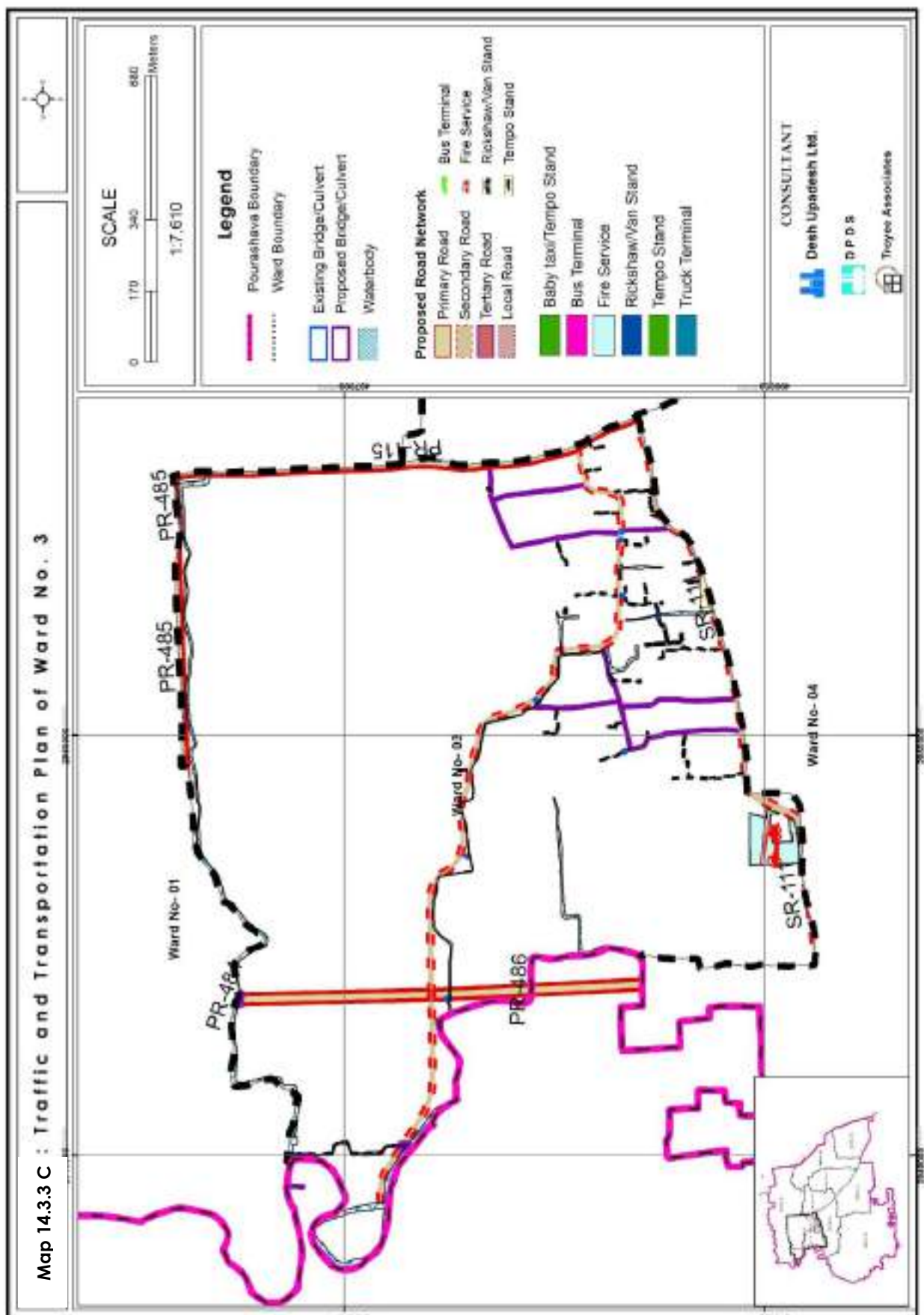
Table 14.3.3F: List of Priority Tasks has to be initiated by the Chandanaish Pourashava

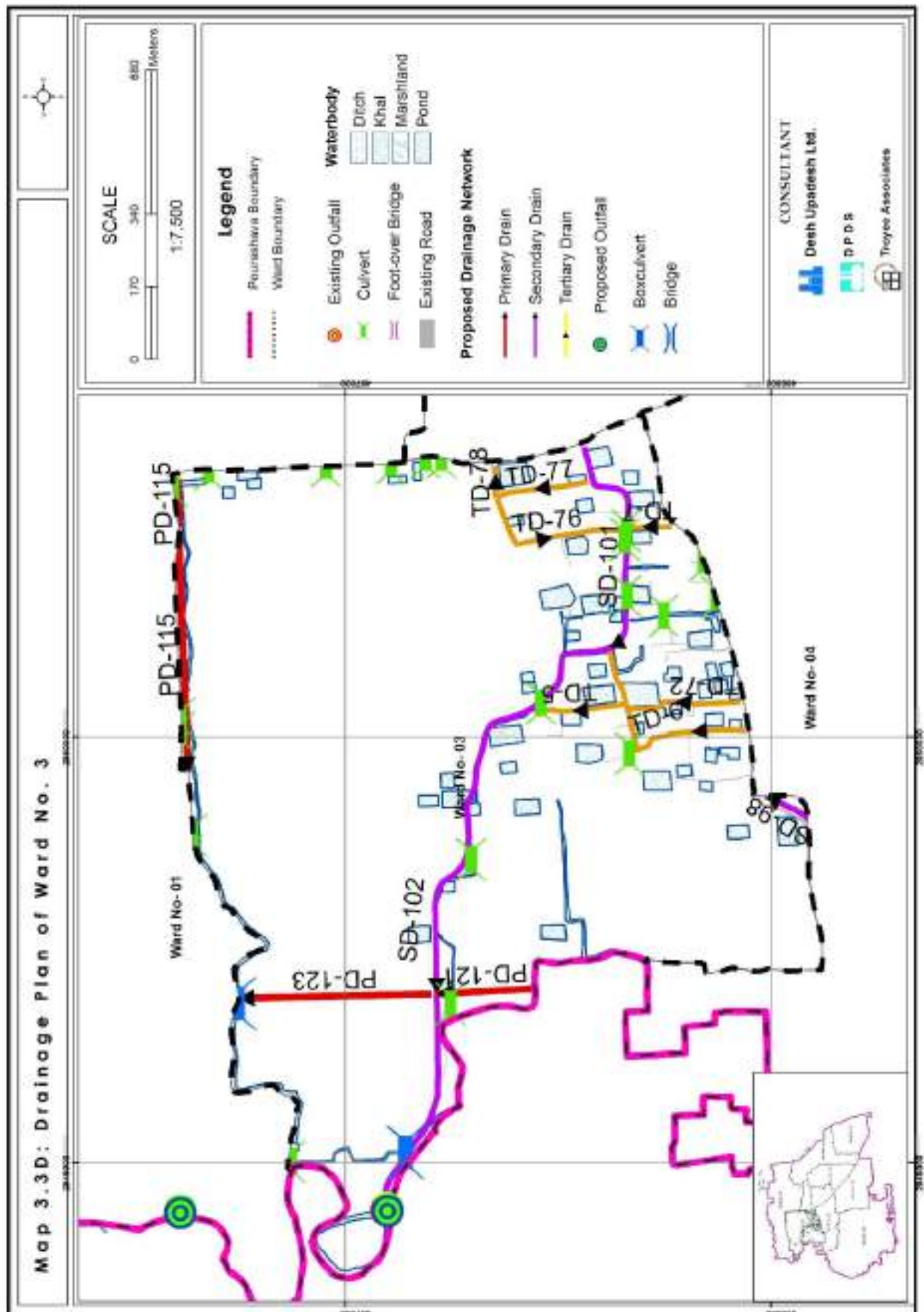
Priority-1		Priority-2		Priority-3	
Type of Construction	ID	Type of Construction	ID	Type of Construction	ID
Road Development	PR-115	Road Development	SR-104	Road Development	LR-149
	SR-113		SR-105		LR-150
			TR-40		LR-151
			TR-82		LR-152
					LR-153
					LR-154
					LR-155
					LR-156
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					LR-158
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					LR-166
					LR-167
					LR-174
					LR-176
					LR-178
					LR-246
					LR-247
					LR-248
					LR-457
					LR-459
					LR-461
					PR-484
					PR-485
					PR-486
					TR-38

Priority-1		Priority-2		Priority-3	
Type of Construction	ID	Type of Construction	ID	Type of Construction	ID
					TR-39 TR-41 TR-42
Drain	PD-115 PD-121 PD-123	Drain	SD-101 SD-102 SD-98	Drain	TD-5 TD-6 TD-7 TD-72 TD-76 TD-77 TD-78
Other Facilities	Waste Transfer Station, Fire Service	Other Facilities	High School	Other Facilities	-

Source: Prepared by consultants'

Plot wise specific development proposal is attached in *Annex-7*, list of road inventory and drainage inventory is given in *Annex-8 and Annex-9* respectively.





14.3.4: Action Plan for Ward 04

14.3.4.1 Criteria for the Plan Proposal

Demography

Ward no. 4 is located on the south-west middle part of the Pourashava. As per the pourashava population census data of 2011, the Ward No. 04 had a population of 6259 persons. Family size was 6; sex ratio was same with male and female. Population projection shows 6743 population for the year 2016. For the same year, it has a gross density of about 21 persons per acre and it will be 27 persons per acre in 2031. Table 3.4.1 shows the detail.

Table 14.3.4A: Population Statistics of Ward No. 04

Item	Year				
	2011	2016	2021	2026	2031
Area (Acre)	318.07	318.07	318.07	318.07	318.07
Population	6,259	6,743	7,264	7,825	8,430
Population Density per acre	20	21	23	25	27

Source: Chandanaish Pourashava, 2011

14.3.4.2 Critical Issues and Opportunities of the ward

Critical Issues

Ward no. 4 is the south-west middle part of the Chandanaish Pourashava with characteristics of some urban and mostly predominant rural activities. It has the following critical issues,

- Lack of basic facilities and infrastructures required for an urban area.
- There is no systematic drainage and solid waste management facilities.
- Lack of adequate road.
- There is no water supply network at this ward.
- There is lack of commercial, open space, recreational, educational and social gathering facilities.

Development Opportunities

Due to low density of population and having external road linkage of the pourashava by Chittagong-Cox's Bazar highway i.e. Arakan Road creates development opportunity of this ward. The development opportunities are as follows,

- From environmental point of view, low density population can create a very livable environment for the area with respect to ventilation, use of road and other basic services.
- Some khals inside of Chandanaish Pourashava plays an important role in drainage system.
- Chittagong-Cox's Bazar highway i.e. Arakan Road also plays pivotal role to develop different facilities due to tourist attracting zone of Cox's Bazar, Teknaf and Saint Martin as well as Landport of Teknaf.

14.3.4.3 Proposals and Plan for Ward No. 04

14.3.4.3.1 Review of Existing Land Use

Ward No. 04 is mixed urban in character. Out of total 318.09 acres of land of this ward, around 170.46 acres of land i.e. 53.59% is reserved for agriculture. In existing land uses, both the urban residential and rural homestead has been considered as residential use as a whole. The residential use with 77.55 acres, occupies 24.38% of total land, water bodies 15.86%, circulation network 1.89% and education and research 1.18%. Only 0.22% of land is used as government service. There is only 0.42% land for urban green space and recreational facilities. No other notable type of land uses are found in this ward. Table 3.4.2 shows the existing and proposed land use pattern of the ward (Map 3.4A and Map 3.4B).

14.3.4.3.2 Proposed Land Use Zoning

The category wise proposals are presented here. Table 3.4.2 shows the amount of land existing and proposed uses in Ward no. 4.

i. Urban Residential Zone

At present around 117.29 acres land is occupied by urban residential use as a whole. In Ward Action Plan of Ward 04, around 0.50 acre of land has been earmarked for urban residential use which will occupy 0.07% of the total land in Ward 04.

ii. Rural Settlement

As this Ward is predominantly rural in character, a large portion of land like 135.60 acres (19.11%) of land is proposed for rural settlement up to the year 2031.

Table 14.3.4B: Summary of the Existing Land uses and Proposed Land uses

Sl. No.	Existing Landuse	Area in Acres	%	Sl. No.	Proposed General Landuse	Area in Acres	%
1	Residential	77.55	24.38	1	Urban Residential Area	34.30	10.78
				2	Rural Settlement	49.20	15.46
2	Education and Research	3.75	1.18	3	Education and Research	17.19	5.40
3	Governmental Services	1.46	0.46	4	Governmental Office	3.90	1.23
4	Non Government Services	-	-	5	Health Services	1.91	0.60
5	Commercial Activity	2.90	0.91	6	Commercial Zone	2.61	0.82
6	Manufacturing and Processing Activity	-	-	7	General Industry	-	-
7	Mixed Use	0.08	0.03	8	Mixed Use	0.06	0.02
8	Circulation Network	6.02	1.89	9	Circulation Network	20.40	6.41
9	Transport and Communication	-	-	10	Transport and Communication	0.60	0.19
10	Service Activity	0.33	0.10	11	Utility Services	0.06	0.02
11	Community Facilities	2.18	0.69	12	Community Facilities	5.63	1.77
12	Recreational Facilities	0.42	0.13	13	Recreational Facilities	0.28	0.09
13	Restricted Area	-	-	14	Restricted Area	-	-
14	Agriculture	170.46	53.59	15	Agriculture	80.66	25.35
15	Urban Green Space	2.12	0.67	16	Urban Green/ Open Space	38.49	12.10
16	Water Bodies	50.45	15.86	17	Water Bodies	31.29	9.83
17	Vacant Land	-	-	18	Historical & Heritage	-	-
18	Forest	-	-	19	Forest	-	-
19	Miscellaneous	0.37	0.12	20	Miscellaneous	0.31	0.10
				21	Urban Deferred	31.27	9.83
Total		318.09	100	Total		318.09	100

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

iii. Education and Research

In Ward Action Plan, a high school, one college and a library is proposed which comprises an area of 14.72 acres.

iv. Government office

In ward no. 4, a ward councilor's office with an area of 2.72 acres of land has been proposed as a ward center. The *Table 3.4.2* has shown in detail and *ANNEX-7* shows the mouza wise plot proposal of the ward councilor's office of Ward no. 4.

v. Commercial Activity

At present, commercial activity and density of population are very low in this ward. Only 0.60 acres of land has been proposed as neighborhood market for this purpose. *Table 3.4.2* shows the existing and proposed commercial land use of Ward no. 4.

vi. 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 20.40 acres of land and about 6.41% of the total area that is more workable for this ward.

vii. Community Facilities

Land for community facilities will be 5.63 acre (1.77%) whereas present land for this purpose in this ward is 2.18 acres. A community center of 1.21 acres has been proposed here beside proposed ward councilor's office.

viii. Agricultural Area

The total area under this use in Ward 04 has been estimated about 80.66 acres of land covering 25.35% of the total land of this ward.

ix. Open Space & Recreational Facilities

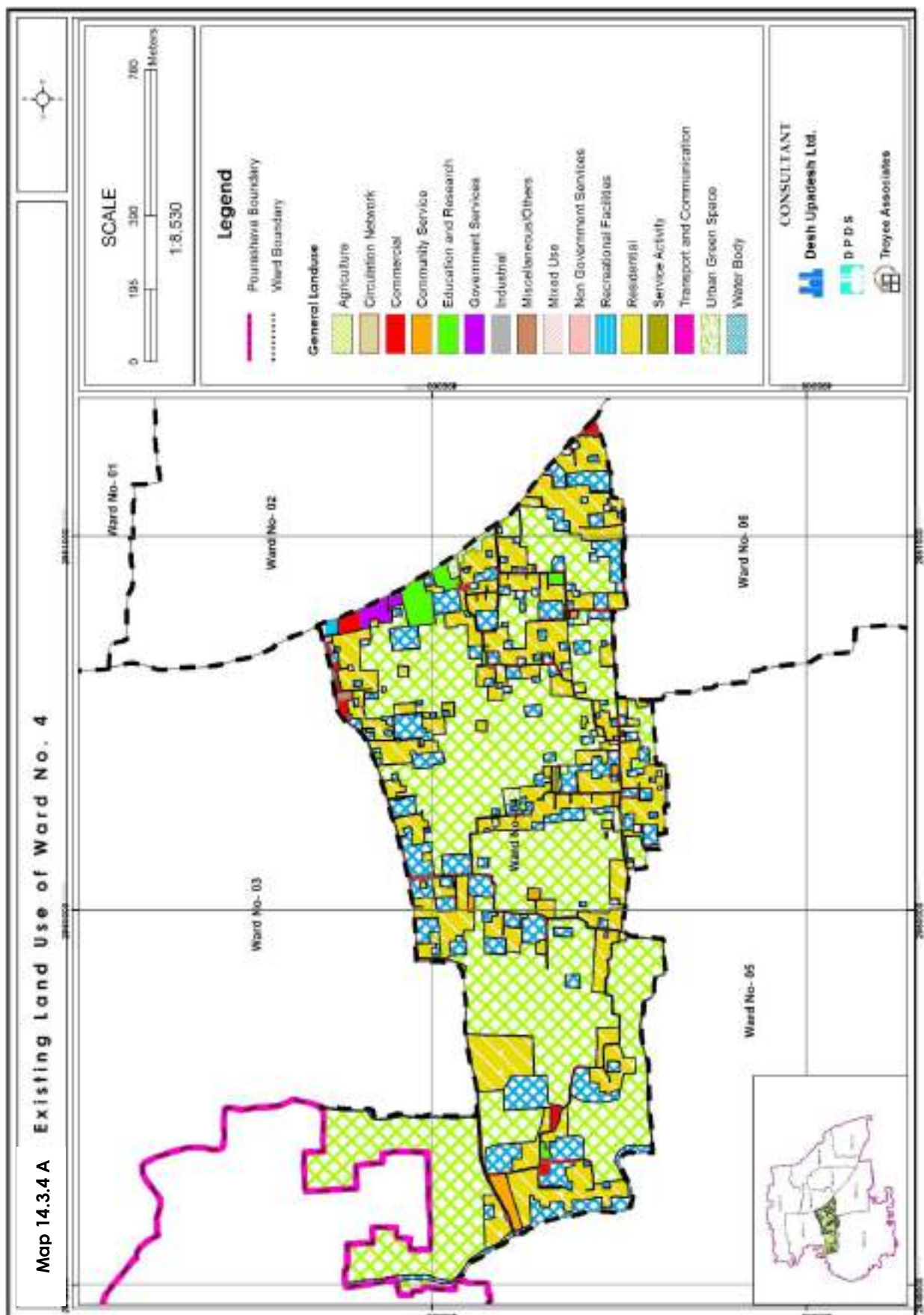
Land for open space will be 38.77 acres (12.19%) which includes open recreational facilities like playground a central park of 27.70 acres.

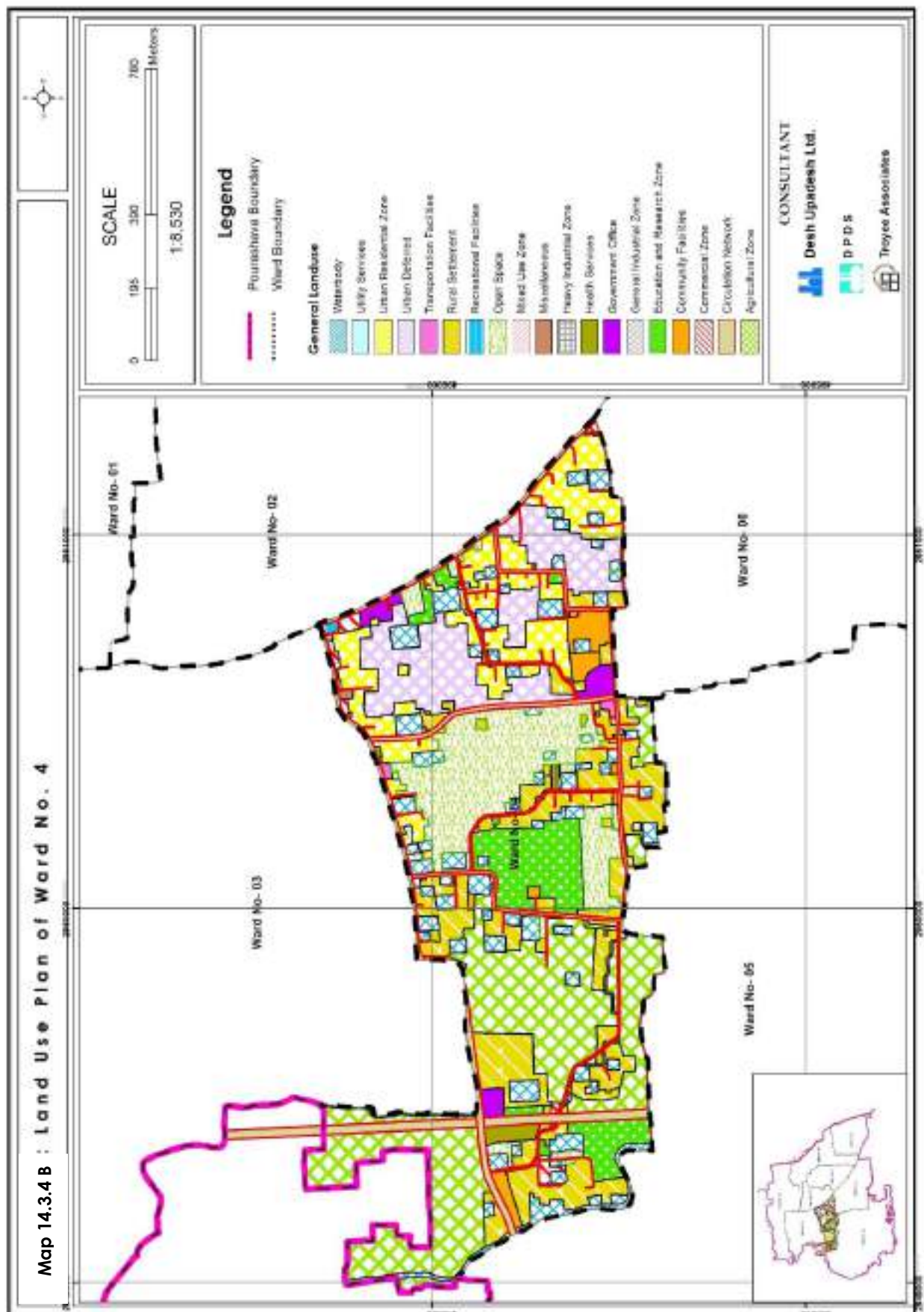
x. Water bodies

The proposed retention area (Water bodies) covers almost 31.29 acres of land which covers 9.83% of the total ward area. All of the existing water bodies like khal, river, pond, ditch etc have tried to preserve as possible.

xi. Utility Services Zone

A total of only 0.06 acres of land covering 0.02% of total land is earmarked as Utility Services zone at Ward No. 04. Map 3.4 shows the proposed location of utilities of ward no. 4





14.3.4.3.3 Proposed Road Infrastructure Development

A total of 9.56 km of road development has been proposed in first ward action plan for Ward No. 04 of Chandanaish Pourashava. Length of the access road (local road) will be 2.49 km and width of these roads will be 10 ft which covers 26.05% of total road network development proposal. Total length of tertiary (20 ft and 30 ft) and secondary road (40 ft and 60 ft) will be 4.13 km and 1.73 km respectively. The rest 1.21 km primary road will be developed and its width will be 80 ft. The detailed scenario of road network development proposal is given in *Table 3.4.3 A and Table 3.4.3 B (Map 3.4C)*.

Table 14.3.4C: Summary of Road Network Proposal at Ward No. 04

Road Width (in Feet)	Type of Road	Total		New Road		Road Widening	
		Length (km)	%	Length (km)	%	Length (km)	%
10	Local Road (as it is)	2.49	26.05	-	-	-	-
20	Tertiary Road	2.24	23.44	-	-	2.24	40.50
30		1.89	19.77	-	-	1.89	34.17
40	Secondary Road	0.69	7.17	0.68	44.05	0.01	0.14
60		1.04	10.92	-	-	1.04	18.88
80	Primary Road	1.21	12.65	0.86	55.95	0.35	6.31
160		-	-	-	-	-	-
Total		9.56	100.00	1.54	100.00	5.53	100.00

Source: Prepared by Consultants

Table 14.3.4D: Phasing of Road Network Proposal at Ward no. 04

Road ID	Road Type	Proposal	Width (ft)	Phasing
TR-10	Tertiary Road	Widening Road	20	Third Phasing
TR-43	Tertiary Road	Widening Road	20	Third Phasing
TR-44	Tertiary Road	Widening Road	20	Third Phasing
TR-45	Tertiary Road	Widening Road	20	Third Phasing
TR-46	Tertiary Road	Widening Road	20	Third Phasing
TR-47	Tertiary Road	Widening Road	20	Third Phasing
TR-48	Tertiary Road	Widening Road	20	Third Phasing
TR-67	Tertiary Road	Widening Road	20	Third Phasing
TR-465	Tertiary Road	Widening Road	30	Third Phasing
TR-479	Tertiary Road	Widening Road	30	Second Phase
TR-83	Tertiary Road	Widening Road	30	Third Phasing
TR-84	Tertiary Road	Widening Road	30	Third Phasing
TR-85	Tertiary Road	Widening Road	30	Third Phasing
TR-86	Tertiary Road	Widening Road	30	Second Phase
TR-89	Tertiary Road	Widening Road	30	Third Phasing
TR-95	Tertiary Road	Widening Road	30	Third Phasing
SR-100	Secondary Road	Widening Road	40	Third Phasing
SR-101	Secondary Road	Widening Road	40	Third Phasing
SR-104	Secondary Road	Widening Road	40	Third Phasing
SR-3	Secondary Road	Widening Road	40	Third Phasing
SR-4	Secondary Road	Widening Road	40	Third Phasing
SR-478	Secondary Road	Widening Road	40	First Phase
SR-479	Secondary Road	Widening Road	40	Third Phasing
SR-5	Secondary Road	Widening Road	40	Third Phasing
SR-99	Secondary Road	Widening Road	40	Third Phasing
SR-111	Secondary Road	Widening Road	60	First Phase
PR-482	Primary Road	New Road	80	First Phase

A total of 5.53 km of road widening has been proposed for this ward. Among these, 4.13 km, 1.05 km and 0.35 km is respectively for tertiary, secondary and primary road.

14.3.4.3.4 Proposed Drainage Infrastructure Development

Existing drainage is mostly depending on natural drainage facilities. The proposed drainage facilities will be developed based on these natural channels. The primary drain (1.52 km) for the ward which will be connected by 1.69 km secondary drain and 3.97 km tertiary drain. Table 3.4.4 shows the detail Drainage Network of Ward No. 04 in Chandanaish Pourashava (Map 3.4D).

Table 14.3.4E: Summary of Drainage Network Proposal at Ward No. 04

Drain Hierarchy	Drain Width (Meter)	Proposed Drain ID	Length (Km)
Primary Drain	1.50	PD-116	0.67
	1.50	PD-111	0.44
	1.50	PD-121	0.41
Sub-Total			1.52
Secondary Drain	1.00	SD-98	1.64
	1.00	SD-104	0.05
Sub-Total			1.69
Tertiary Drain	0.50	TD-55	0.59
	0.50	TD-56	0.54
	0.50	TD-57	0.58
	0.50	TD-71	0.27
	0.80	TD-95	1.34
	0.80	TD-90	0.65
Sub-Total			3.97
Grand Total			7.18

Source: Prepared by Consultants

14.3.4.3.5 Priority Tasks

The following priorities has been identified after the public consultation meeting at Chandanaish Pourashava. Among these tasks, activities under Priority-1 to be executed by first 5 years, actions under Priority-2 to be done by next 5 years and tasks under Priority-3 to be accomplished by last 10 years.

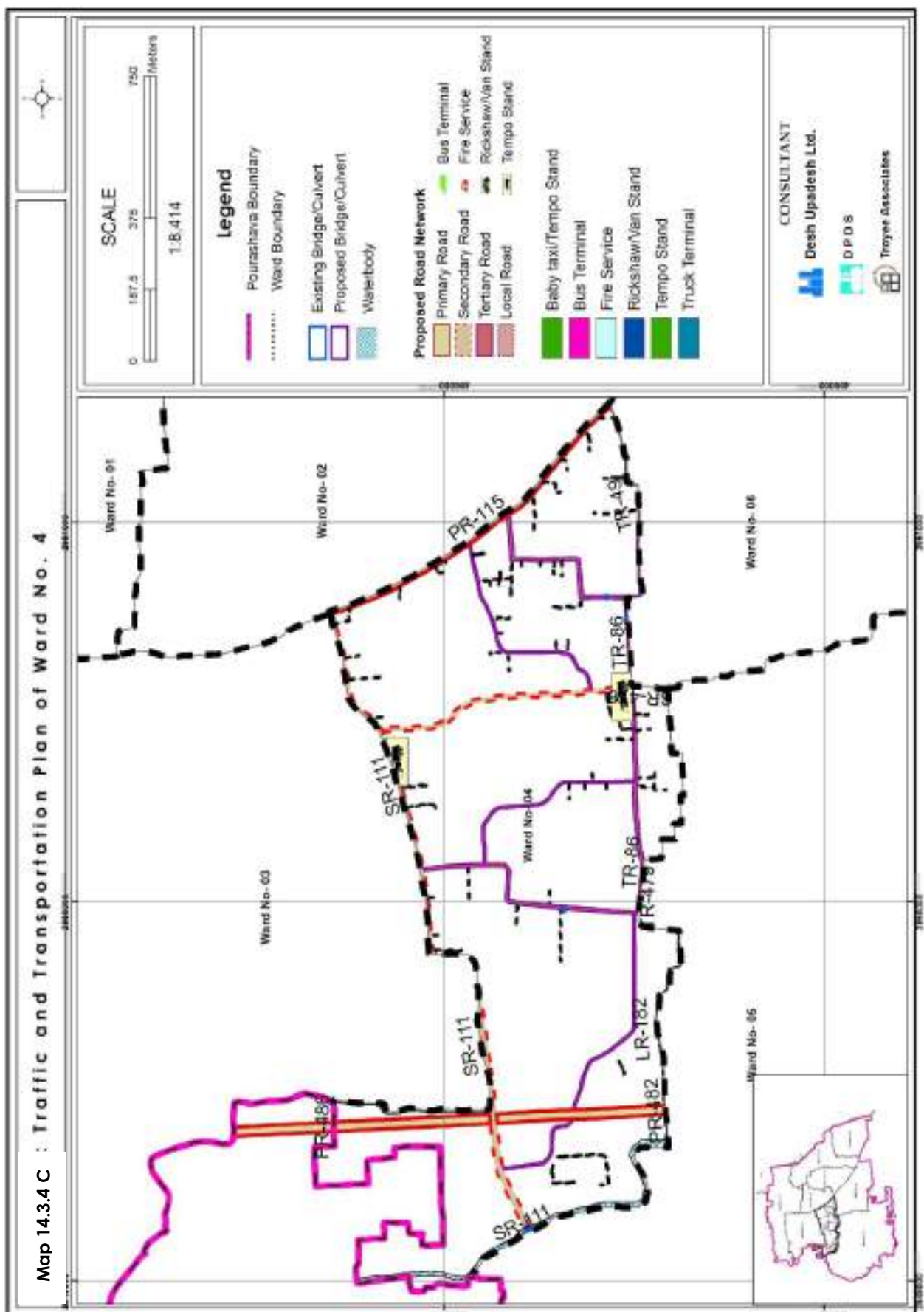
Table 14.3.4F: List of Priority Tasks has to be initiated by the Chandanaish Pourashava

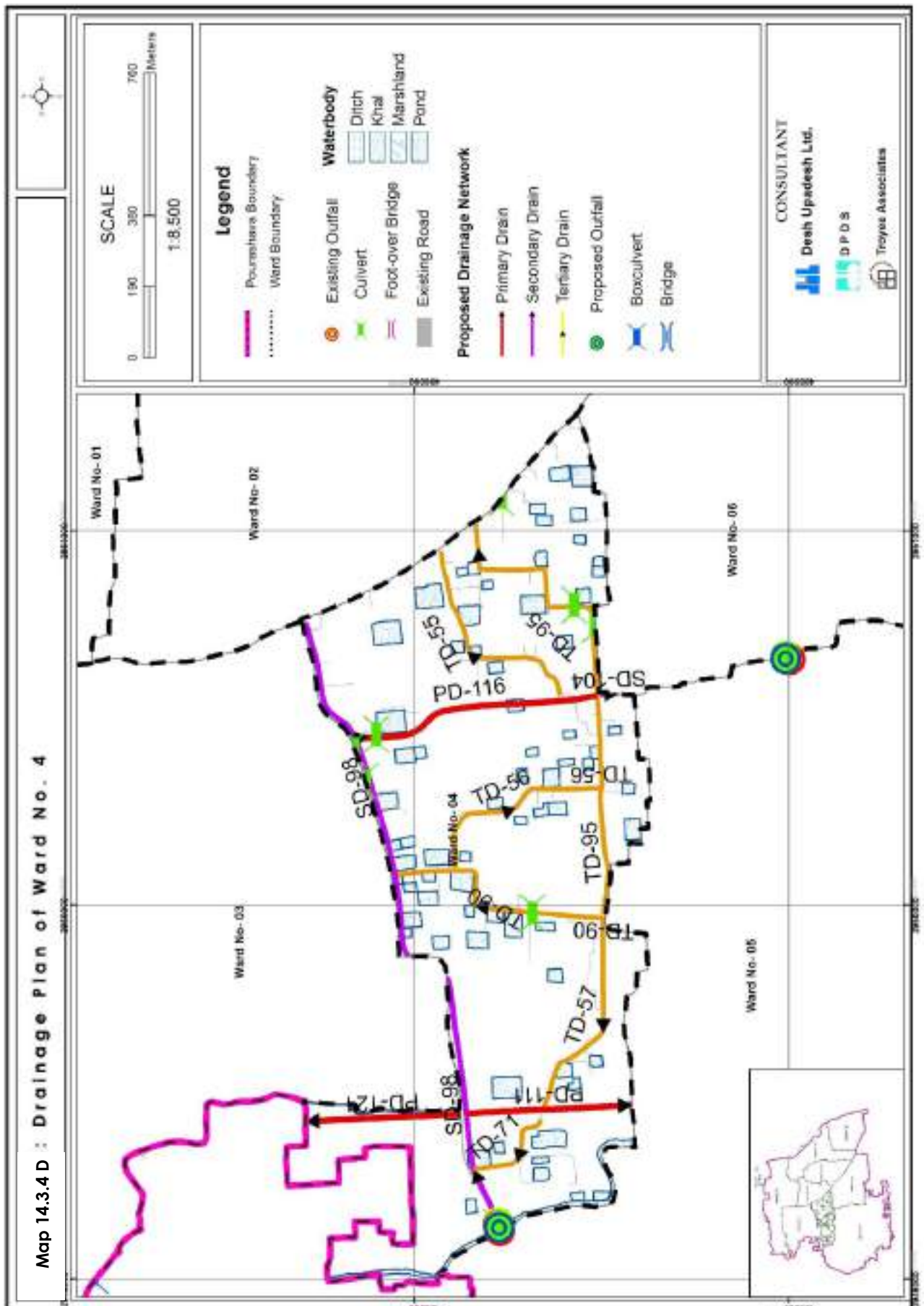
Priority-1		Priority-2		Priority-3	
Type of Construction	ID	Type of Construction	ID	Type of Construction	ID
Road Development	PR-115, PR-482, SR-107, SR-113, SR-480	Road Development	TR-49, TR-70, TR-86, TR-479	Road Development	LR-168, LR-169, LR-170, LR-171, LR-172, LR-173, LR-175, LR-177, LR-179, LR-180, LR-181, LR-182, LR-183, LR-184, LR-185, LR-212, LR-213, LR-214, LR-215, LR-216, LR-241, LR-242, LR-243, LR-244, LR-245, LR-249, LR-250, LR-251, LR-252, LR-253, LR-254, LR-255, LR-256, LR-257, LR-258, LR-259, LR-260, LR-261, LR-262, LR-263, LR-264, LR-267, LR-268, LR-272, LR-273, LR-274, LR-275, LR-276, LR-277, LR-278

Priority-1		Priority-2		Priority-3	
Type of Construction	ID	Type of Construction	ID	Type of Construction	ID
					LR-288, LR-303 LR-304, LR-305 LR-306, LR-454 LR-458, PR-486 TR-1, TR-472 TR-473
Drain	PD-116, PD-111 PD-121	Drain	SD-98, SD-104	Drain	TD-55, TD-56 TD-57, TD-95 TD-71, TD-90
Other Facilities	Central Park, Community Centre, Community Clinic, Ward Office	Other Facilities	High School, Library, Tempo Stand	Other Facilities	College, Neighborhood Market, Tempo Stand

Source: Prepared by consultants'

Plot wise specific development proposal is attached in *Annex-7*, list of road inventory and drainage inventory is given in *Annex-8 and Annex-9* respectively.





14.3.5: Action Plan for Ward 05

14.3.5.1 Criteria for the Plan Proposal

Demography

Ward no. 5 is located on the northern part of the Pourashava. As per the pourashava population census data of 2011, the Ward No. 05 had a population of 8925 persons. Family size was 6; sex ratio was same with male and female. Population projection shows 9615 population for the year 2016. For the same year, it has a gross density of about 14 persons per acre and it will be 17 persons per acre in 2031. *Table 3.5.1* shows the detail.

Table 14.3.5A: Population Statistics of Ward No. 05

Item	Year				
	2011	2016	2021	2026	2031
Area (Acre)	709.53	709.53	709.53	709.53	709.53
Population	8,925	9,615	10,358	11,158	12,021
Population Density per acre	13	14	15	16	17

Source: Chandanaish Pourashava, 2011

14.3.5.2 Critical Issues and Opportunities of the ward

Critical Issues

Ward no. 5 is the northern part of the Chandanaish Pourashava with characteristics of some urban and mostly predominant rural activities. It has the following critical issues,

- Lack of basic facilities and infrastructures required for an urban area.
- There is no systematic drainage and solid waste management facilities.
- Lack of adequate road.
- There is no water supply network at this ward.
- There is lack of commercial, open space, recreational, educational and social gathering facilities.

Development Opportunities

Due to low density of population and having external road linkage by Chittagong-Cox's Bazar highway i.e. Arakan Road creates development opportunity of this ward. The development opportunities are as follows,

- From environmental point of view, low density population can create a very livable environment for the area with respect to ventilation, use of road and other basic services.
- Some khals inside of Chandanaish Pourashava plays an important role in drainage system.
- Chittagong-Cox's Bazar highway i.e. Arakan Road also plays pivotal role to develop different facilities due to tourist attracting zone of Cox's Bazar, Teknaf and Saint Martin as well as Landport of Teknaf.

14.3.5.3 Proposals and Plan for Ward No. 05

14.3.5.3.1 Review of Existing Land Use

Ward No. 05 is mostly rural but only a few areas urban in character. Out of total 1308.23 acres of land of this ward, around 1052.08 acres of land i.e. 80.42% is reserved for agriculture. In existing land uses, both the urban residential and rural homestead has been considered as residential use as a whole. The residential use with 112.05 acres, occupies 8.57% of total land, water bodies 9.26%, and circulation network 0.96%. There is no land used as government service. Only 0.23% land prevails for urban green space and recreational facilities. No other notable type of land uses are found in this ward. *Table 3.5.2* shows the existing and proposed land use pattern of the ward (*Map 3.5A and Map 3.5B*).

14.3.5.3.2 Proposed Land Use Zoning

The category wise proposals are presented here. *Table 3.5.2* shows the amount of land existing and proposed uses in Ward no. 5.

i. Urban Residential Zone

At present around 112.05 acres land is occupied by urban residential use as a whole. In Ward Action Plan of Ward 05, only 0.05 acre of land has been earmarked for urban residential use which will occupy less than 0.01% of the total land in Ward 05.

ii. Rural Settlement

As this Ward is predominantly rural in character, a large portion of land like 115.28 acres (8.80%) of land is proposed for rural settlement up to the year 2031.

Table 14.3.5B: Summary of the Existing Land uses and Proposed Land uses

Sl. No.	Existing Landuse	Area in Acres	%	Sl. No.	Proposed General Landuse	Area in Acres	%
1	Residential	112.05	8.57	1	Urban Residential Area	0.05	0.00
				2	Rural Settlement	115.28	8.80
2	Education and Research	2.99	0.23	3	Education and Research	6.63	0.51
3	Governmental Services	-	-	4	Governmental Office	1.72	0.13
4	Non Government Services	-	-	5	Health Services	0.04	0.00
5	Commercial Activity	0.62	0.05	6	Commercial Zone	3.82	0.29
6	Manufacturing and Processing Activity	-	-	7	General Industry	-	-
7	Mixed Use	-	-	8	Mixed Use	-	-
8	Circulation Network	12.53	0.96	9	Circulation Network	50.01	3.82
9	Transport and Communication	-	-	10	Transport and Communication	-	-
10	Service Activity	0.06	0.00	11	Utility Services	-	-
11	Community Facilities	3.75	0.29	12	Community Facilities	5.38	0.41
12	Recreational Facilities	-	-	13	Recreational Facilities	-	-
13	Restricted Area	-	-	14	Restricted Area	-	-
14	Agriculture	1052.08	80.42	15	Agriculture	1017.02	77.60
15	Urban Green Space	2.99	0.23	16	Urban Green/ Open Space	21.34	1.63
16	Water Bodies	121.16	9.26	17	Water Bodies	89.27	6.81
17	Vacant Land	-	-	18	Historical & Heritage	-	-
18	Forest	-	-	19	Forest	-	-
19	Miscellaneous	-	-	20	Miscellaneous	-	-
				21	Urban Deferred	-	-
Total		1308.23	100	Total		1308.23	100

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

iii. Education and Research

In Ward Action Plan, two primary schools and one madrasa are proposed which comprises an area of 3.58 acres.

iv. Government office

In ward no. 5, a ward councilor's office with an area of 1.72 acres of land has been proposed as a ward center. The *Table 3.5.2* has shown in detail and *Annex-7* shows the mouza wise plot proposal of the ward councilor's office of Ward no. 5.

v. Commercial Activity

At present, commercial activity and density of population are very low in this ward. Only 3.35 acres of land has been proposed as corner shop for this purpose.

v. 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 50.01 acres of land and about 3.82% of the total area that is more workable for this ward.

vii. Community Facilities

Land for community facilities will be 5.38 acre (0.41%) whereas present land for this purpose in this ward is 3.75 (0.29%) acres. A community center of 1.80 acres has been proposed here beside proposed ward councilor's office.

viii. Agricultural Area

The total area under this use in Ward 05 has been estimated about 1017.02 acres of land covering 77.06% of the total land of this ward.

ix. Open Space & Recreational Facilities

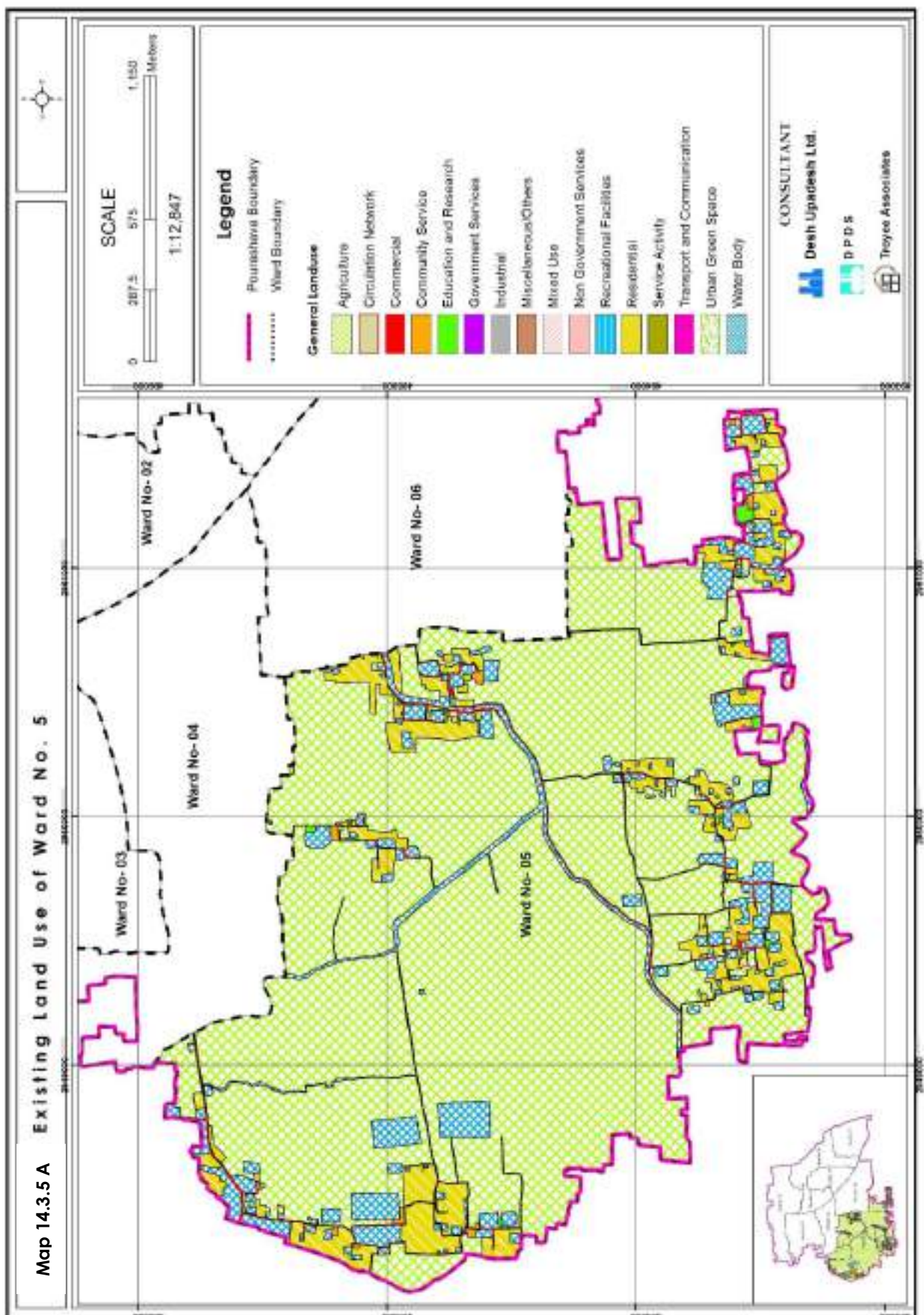
Land for open space will be 21.34 acres (1.63%) which includes open recreational facilities like playground and park.

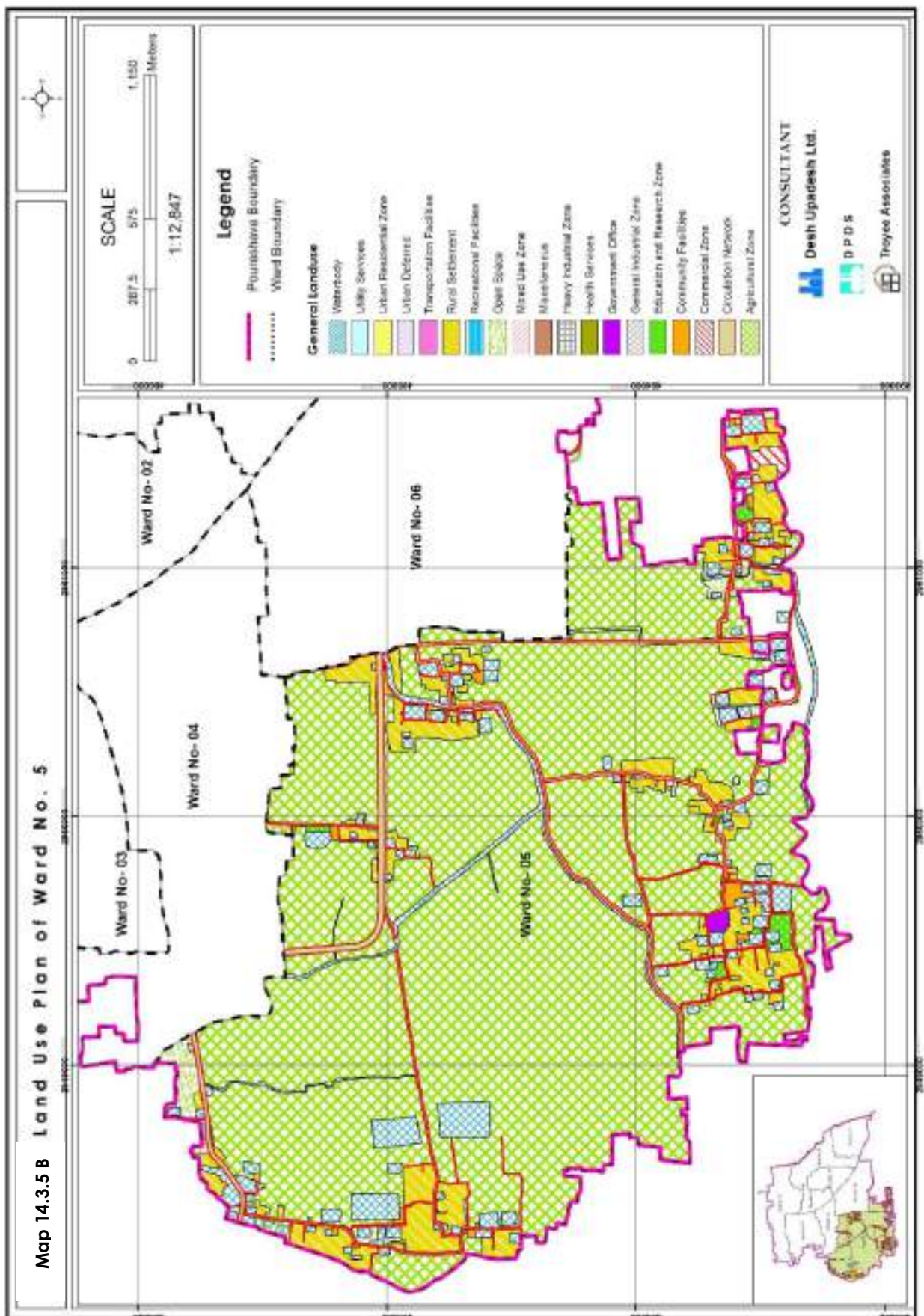
x. Water bodies

The proposed retention area (Water bodies) covers almost 89.27 acres of land which covers 6.81% of the total ward area. All of the existing water bodies like khal, river, pond, ditch etc have tried to preserve as possible.

xi. Utility Services Zone

No land is earmarked as Utility Services zone at Ward No. 05.





14.3.5.3.3 Proposed Road Infrastructure Development

A total of 21.16 km of road development has been proposed in first ward action plan for Ward No. 05 of Chandanaish Pourashava. Length of the access road (local road) will be 4.55 km and width of these roads will be 10 ft which covers 21.41% of total road network development proposal. Total length of tertiary (20 ft and 30 ft) and secondary road (40 ft and 60 ft) will be 8.60 km and 6.58 km respectively. The rest 1.52 km primary road will be developed and its width will be 80 ft. The detailed scenario of road network development proposal is given in Table 3.5.3A and 3.5.3B (Map 3.5C).

Table 14.3.5C: Summary of Road Network Proposal at Ward No. 05

Road Width (in Feet)	Type of Road	Total		New Road		Road Widening	
		Length (km)	%	Length (km)	%	Length (km)	%
10	Local Road (as it is)	4.55	21.41	-	-	-	-
20	Tertiary Road	3.56	16.75	-	-	3.56	23.45
30		5.04	23.71	-	-	5.04	33.20
40	Secondary Road	5.77	27.15	-	-	5.77	38.01
60		0.81	3.82	-	-	0.81	5.35
80	Primary Road	1.52	7.17	1.52	100.00	-	-
160		-	-	-	-	-	-
Total		21.26	100.00	1.52	100.00	15.18	100.00

Source: Prepared by Consultants

Table 14.3.5D: Phasing of Road Network Proposal at Ward No. 05

Road ID	Road Type	Proposal	Width (ft)	Phasing
TR-10	Tertiary Road	Widening Road	20	Third Phasing
TR-43	Tertiary Road	Widening Road	20	Third Phasing
TR-44	Tertiary Road	Widening Road	20	Third Phasing
TR-45	Tertiary Road	Widening Road	20	Third Phasing
TR-46	Tertiary Road	Widening Road	20	Third Phasing
TR-47	Tertiary Road	Widening Road	20	Third Phasing
TR-48	Tertiary Road	Widening Road	20	Third Phasing
TR-67	Tertiary Road	Widening Road	20	Third Phasing
TR-465	Tertiary Road	Widening Road	30	Third Phasing
TR-479	Tertiary Road	Widening Road	30	Second Phase
TR-83	Tertiary Road	Widening Road	30	Third Phasing
TR-84	Tertiary Road	Widening Road	30	Third Phasing
TR-85	Tertiary Road	Widening Road	30	Third Phasing
TR-86	Tertiary Road	Widening Road	30	Second Phase
TR-89	Tertiary Road	Widening Road	30	Third Phasing
TR-95	Tertiary Road	Widening Road	30	Third Phasing
SR-100	Secondary Road	Widening Road	40	Third Phasing
SR-101	Secondary Road	Widening Road	40	Third Phasing
SR-104	Secondary Road	Widening Road	40	Third Phasing
SR-3	Secondary Road	Widening Road	40	Third Phasing
SR-4	Secondary Road	Widening Road	40	Third Phasing
SR-478	Secondary Road	Widening Road	40	First Phase
SR-479	Secondary Road	Widening Road	40	Third Phasing
SR-5	Secondary Road	Widening Road	40	Third Phasing
SR-99	Secondary Road	Widening Road	40	Third Phasing
SR-111	Secondary Road	Widening Road	60	First Phase
PR-482	Primary Road	New Road	80	First Phase

A total of 15.18 km of road widening has been proposed for this ward. Among these, 8.60 km and 6.58 km is respectively for tertiary and secondary road.

14.3.5.3.4 Proposed Drainage Infrastructure Development

Existing drainage is mostly depending on natural drainage facilities. The proposed drainage facilities will be developed based on these natural channels. The primary drain (1.50 km) for the ward which will be connected by 7.07 km secondary drain and 5.68 km tertiary drain. *Table 3.5.4* shows the detail Drainage Network of Ward No. 05 in Chandanaish Pourashava (*Map 3.5D*).

Table 14.3.5E: Summary of Drainage Network Proposal at Ward No. 05

Drain Hierarchy	Drain Width (Meter)	Proposed Drain ID	Length (Km)
Primary Drain	1.50	PD-111	1.50
Sub-Total			1.50
Secondary Drain	1.00	SD-100	1.05
	1.00	SD-124	0.26
	1.00	SD-126	0.82
	1.00	SD-99	2.25
	1.00	SD-103	1.54
	1.00	SD-104	0.35
	1.00	SD-107	0.48
	1.00	SD-108	0.32
Sub-Total			7.07
Tertiary Drain	0.50	TD-9	0.74
	0.50	TD-10	0.60
	0.50	TD-11	0.75
	0.50	TD-12	0.23
	0.50	TD-13	0.19
	0.50	TD-53	0.21
	0.80	TD-91	0.99
	0.80	TD-83	1.52
	0.80	TD-90	0.45
Sub-Total			5.68
Grand Total			14.25

Source: Prepared by Consultants

14.3.5.3.5 Priority Tasks

The following priorities have been identified after the public consultation meeting at Chandanaish Pourashava. Among these tasks, activities under Priority-1 to be executed by first 5 years, actions under Priority-2 to be done by next 5 years and tasks under Priority-3 to be accomplished by last 10 years.

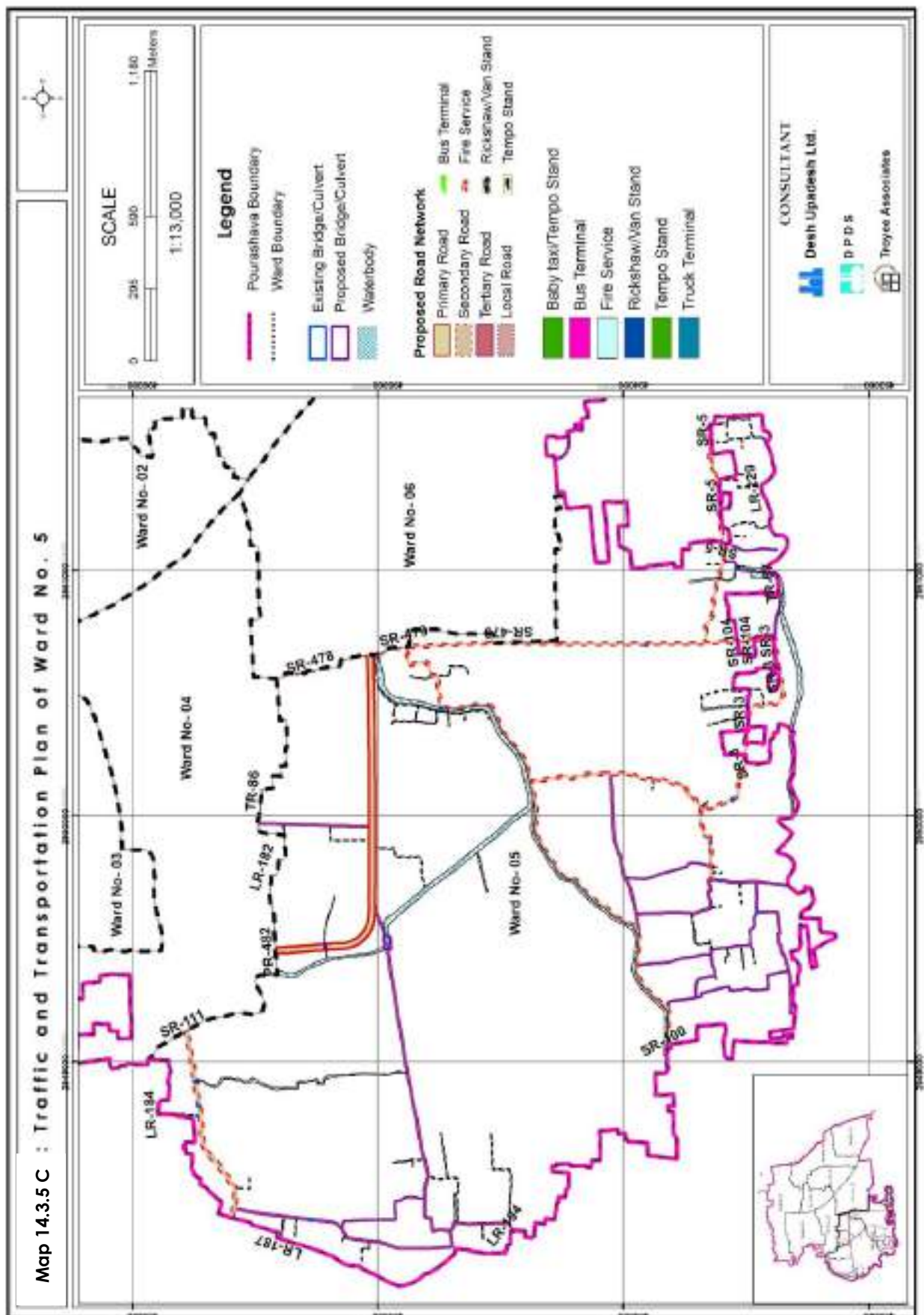
Table 14.3.5F: List of Priority Tasks has to be initiated by the Chandanaish Pourashava

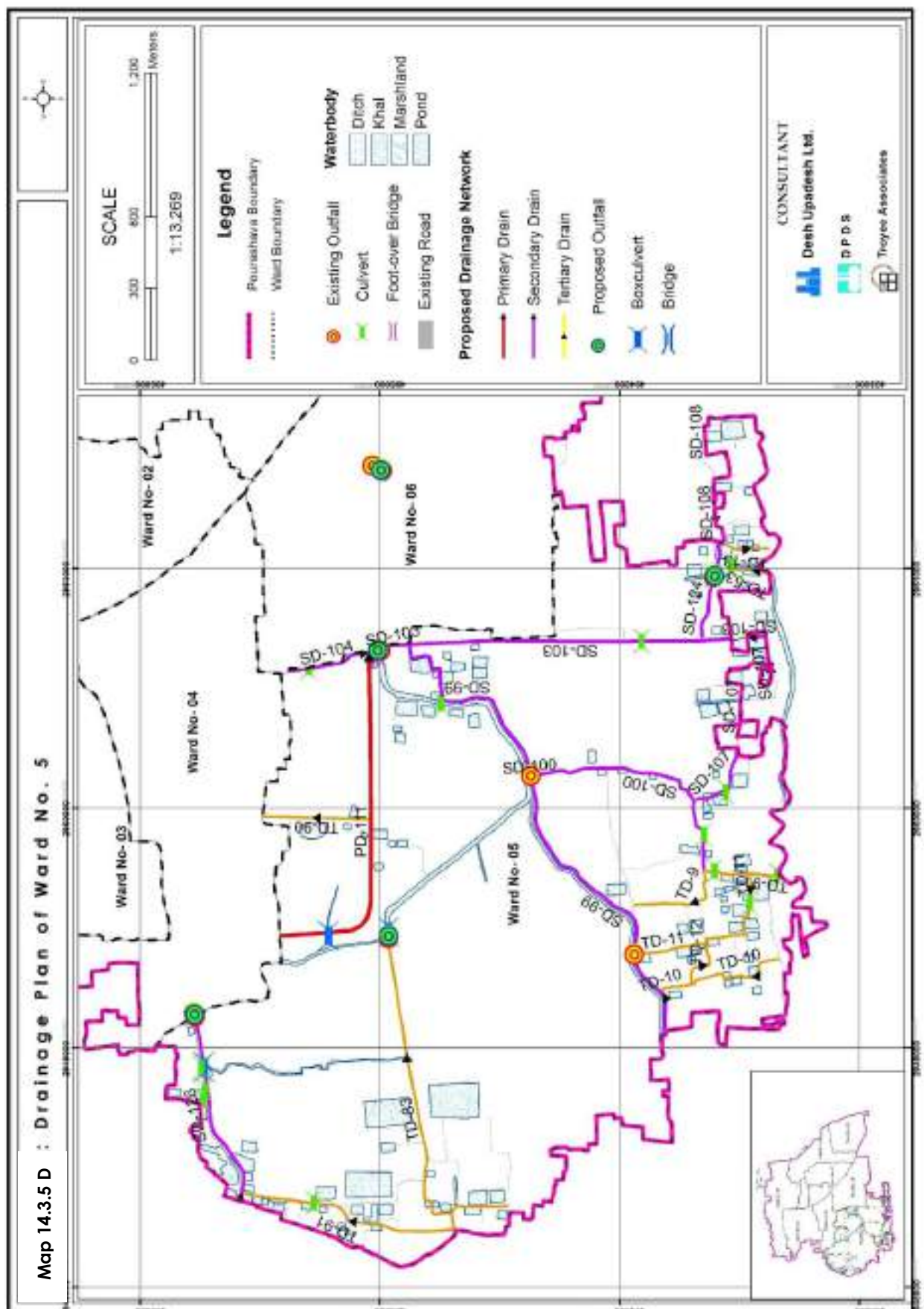
Priority-1		Priority-2		Priority-3	
Type of Construction	ID	Type of Construction	ID	Type of Construction	ID
Road Development	PR-482, SR-113 SR-480	Road Development	TR-86, TR-479	Road Development	LR-184, LR-186 LR-187, LR-188 LR-189, LR-190 LR-191, LR-192 LR-193, LR-194 LR-195, LR-196 LR-197, LR-198 LR-199, LR-200 LR-201, LR-202 LR-203, LR-204 LR-205, LR-206 LR-207, LR-217 LR-218, LR-219 LR-220, LR-221 LR-222, LR-223 LR-224, LR-225 LR-226, LR-227 LR-228, LR-229

Priority-1		Priority-2		Priority-3	
Type of Construction	ID	Type of Construction	ID	Type of Construction	ID
					LR-230, LR-231 LR-232, LR-233 LR-234, LR-235 LR-236, LR-237 LR-238, LR-239 LR-240, LR-460 LR-464, SR-3 SR-4, SR-5 SR-99, SR-100 SR-101, SR-106 SR-481, TR-10 TR-43, TR-44 TR-45, TR-46 TR-47, TR-48 TR-67, TR-83 TR-84, TR-85 TR-89, TR-95 TR-465
Drain	PD-111	Drain	SD-100, SD-124 SD-126, SD-99 SD-103, SD-104 SD-107, SD-108	Drain	TD-9, TD-10 TD-11, TD-12 TD-13, TD-91 TD-83, TD-53 TD-90
Other Facilities	Ward Office Community Centre Primary School	Other Facilities	Madrasha Park	Other Facilities	Primary School Corner Shop

Source: Prepared by consultants'

Plot wise specific development proposal is attached in *Annex-7*, list of road inventory and drainage inventory is given in *Annex-8 and Annex-9* respectively.





14.3.6: Action Plan for Ward 06

14.3.6.1 Criteria for the Plan Proposal

Demography

Ward No. 6 is located on the southern part of the Pourashava. As per the pourashava population census data of 2011, the Ward no. 06 had a population of 8355 persons. Family size was 6; sex ratio was same with male and female. Population projection shows 9001 population for the year 2016. For the same year, it has a gross density of about 17 persons per acre and it will be 23 persons per acre in 2031. *Table 3.6.1* shows the detail.

Table 14.3.6A: Population Statistics of Ward no. 06

Item	Year				
	2011	2016	2021	2026	2031
Area (Acre)	482.16	482.16	482.16	482.16	482.16
Population	8,355	9,001	9,696	10,446	11,253
Population Density per acre	17	19	20	22	23

Source: Chandanaish Pourashava, 2011

14.3.6.2 Critical Issues and Opportunities of the ward

Critical Issues

Ward No. 6 is the southern part of the Chandanaish Pourashava with characteristics of some urban and mostly predominant rural activities. It has the following critical issues,

- Lack of basic facilities and infrastructures required for an urban area.
- There is no systematic drainage and solid waste management facilities.
- Lack of adequate road.
- There is no water supply network at this ward.
- There is lack of commercial, open space, recreational, educational and social gathering facilities.

Development Opportunities

Due to low density of population and having external road linkage of the pourashava by Chittagong-Cox's Bazar highway i.e. Arakan Road creates development opportunity of this ward. The development opportunities are as follows,

- From environmental point of view, low density population can create a very livable environment for the area with respect to ventilation, use of road and other basic services.
- Some khals inside of Chandanaish Pourashava plays an important role in drainage system.
- Chittagong-Cox's Bazar highway i.e. Arakan Road also plays pivotal role to develop different facilities due to tourist attracting zone of Cox's Bazar, Teknaf and Saint Martin as well as Landport of Teknaf.

14.3.6.3 Proposals and Plan for Ward no. 06

14.3.6.3.1 Review of Existing Land Use

Ward no. 06 is mostly rural but only a few areas urban in character. Out of total 482.16 acres of land of this ward, around 301.88 acres of land i.e. 62.61% is reserved for agriculture. In existing land uses, both the urban residential and rural homestead has been considered as residential use as a whole. The residential use with 105.11 acres, occupies 21.80% of total land, water bodies 12.20% and circulation network 1.51%. No land is used as government service. There is only 0.77% land for urban green space and recreational facilities. No other notable type of land uses are found in this ward. *Table 3.6.2* shows the existing and proposed land use pattern of the ward (*Map 3.6A and Map 3.6B*).

3.6.3.2 Proposed Land Use Zoning

The category wise proposals are presented here. *Table 3.6.2* shows the amount of land existing and proposed uses in Ward No. 6.

i. Urban Residential Zone

At present no land is occupied by urban residential use as a whole. Thus, in Ward Action Plan of Ward 06, no land has been earmarked for urban residential use.

ii. Rural Settlement

As this Ward is predominantly rural in character, a large portion of land like 114.04 acres (23.65%) of land is proposed for rural settlement up to the year 2031.

Table 14.3.6B: Summary of the Existing Land uses and Proposed Land uses

Sl. No.	Existing Landuse	Area in Acres	%	Sl. No.	Proposed General Landuse	Area in Acres	%
1	Residential	105.11	21.80	1	Urban Residential Area	-	-
				2	Rural Settlement	114.04	23.65
2	Education and Research	0.69	0.14	3	Education and Research	7.72	1.60
3	Governmental Services	-	-	4	Governmental Office	18.00	3.73
4	Non Government Services	-	-	5	Health Services	0.47	0.10
5	Commercial Activity	2.00	0.41	6	Commercial Zone	21.14	4.38
6	Manufacturing and Processing Activity	-	-	7	General Industry	-	-
7	Mixed Use	-	-	8	Mixed Use	-	-
8	Circulation Network	7.26	1.51	9	Circulation Network	24.01	4.98
9	Transport and Communication	-	-	10	Transport and Communication	5.88	1.22
10	Service Activity	0.05	0.01	11	Utility Services	-	-
11	Community Facilities	2.62	0.54	12	Community Facilities	2.15	0.45
12	Recreational Facilities	-	-	13	Recreational Facilities	-	-
13	Restricted Area	-	-	14	Restricted Area	-	-
14	Agriculture	301.88	62.61	15	Agriculture	234.19	48.57
15	Urban Green Space	3.73	0.77	16	Urban Green/ Open Space	12.86	2.67
16	Water Bodies	58.82	12.20	17	Water Bodies	41.71	8.65
17	Vacant Land	-	-	18	Historical & Heritage	-	-
18	Forest	-	-	19	Forest	-	-
19	Miscellaneous	-	-	20	Miscellaneous	-	-
				21	Urban Deferred	-	-
Total		482.16	100	Total		482.16	100

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

iii. Education and Research

In Ward Action Plan, one Primary school and 4 madrasa is proposed which comprises an area of 7.14 acres.

iv. Government office

In Ward No. 6, a jail/ sub-jail and an agri extension farm with an area of 18.00 acres has been proposed under this landuse. *Table 3.6.2* has shown in detail and *ANNEX-7* shows the mouza wise plot proposal of Ward No. 6.

v. Commercial Activity

At present, commercial activity and density of population are very low in this ward. However, 19.57 acres of land has been proposed as retail market and wholesale market for this purpose.

vi. 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 24.01 acres of land and about 4.98% of the total area that is more workable for this ward.

vii. Community Facilities

Land for community facilities will be 2.15 acre (0.45%) whereas present land for this purpose in this ward is 2.62 acres (0.54%).

viii. Agricultural Area

The total area under this use in Ward 06 has been estimated about 234.19 acres of land covering 48.57% of the total land of this ward.

ix. Open Space & Recreational Facilities

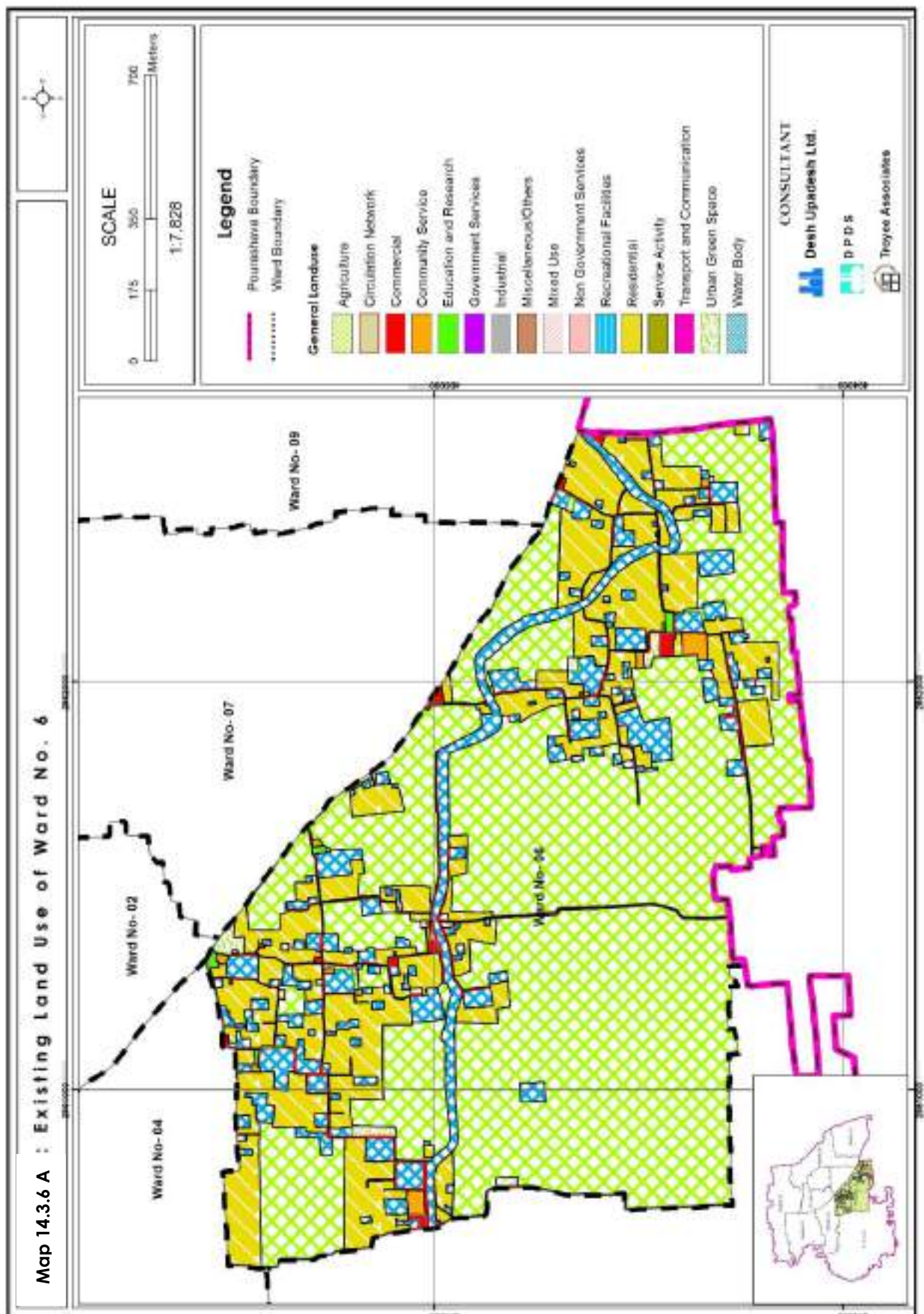
Land for open space will be 12.86 acres (2.67%) which includes open recreational facilities like playground and park.

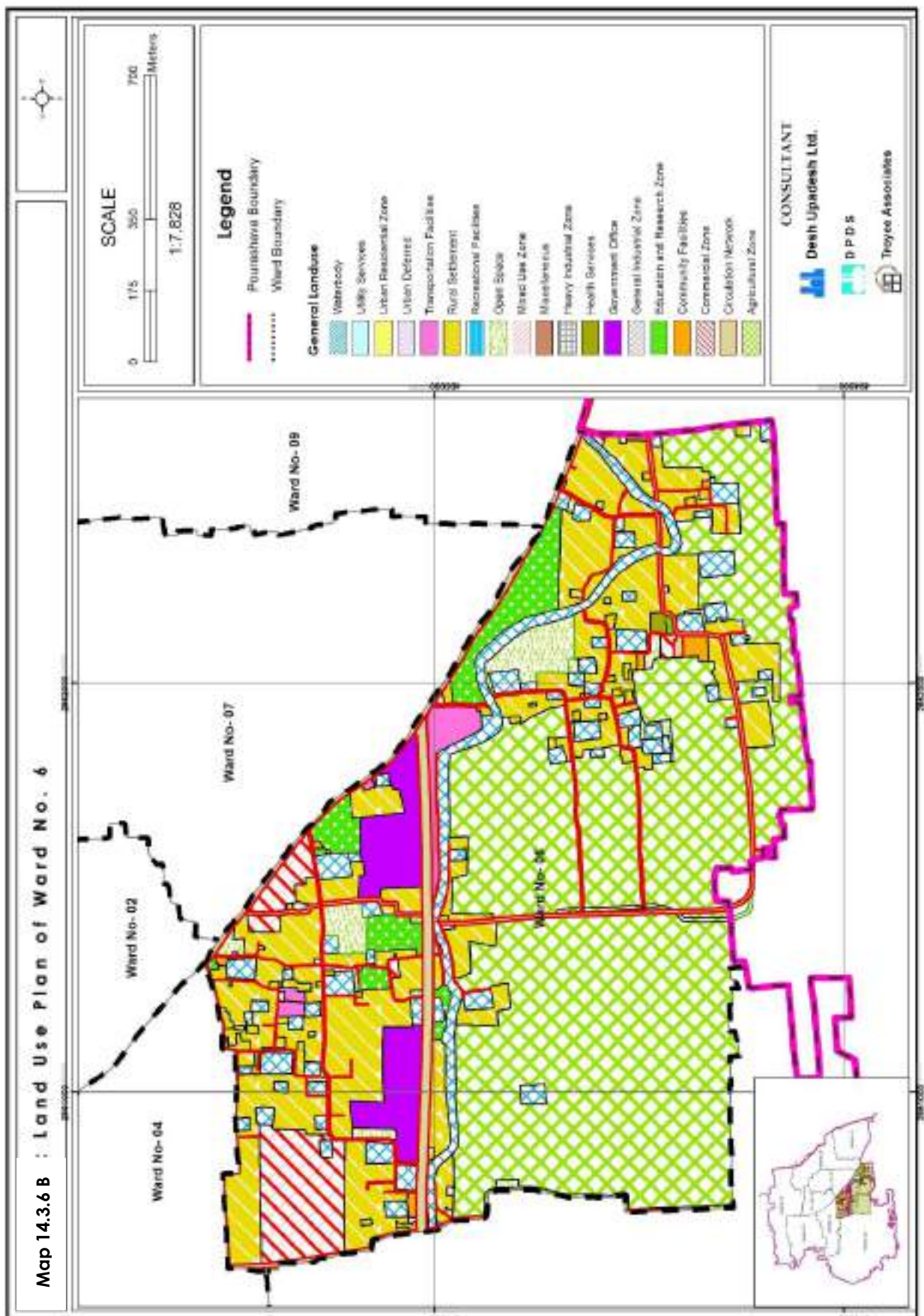
x. Water bodies

The proposed retention area (Water bodies) covers almost 41.71 acres of land which covers 8.65% of the total ward area. All of the existing water bodies like khal, river, pond, ditch etc have tried to preserve as possible.

xi. Utility Services Zone

No land is earmarked as Utility Services zone at Ward no. 06.





14.3.6.3.3 Proposed Road Infrastructure Development

A total of 11.34 km of road development has been proposed in first ward action plan for Ward no. 06 of Chandanaish Pourashava. Length of the access road (local road) will be 3.35 km and width of these roads will be 10 ft which covers 29.54% of total road network development proposal. Total length of tertiary (20 ft and 30 ft) and secondary road (40 ft and 60 ft) will be 5.66 km and 0.45 km respectively. The rest 1.88 km primary road will be developed and its width will be 80 ft. The detailed scenario of road network development proposal is given in Table 3.6.3A and 3.6.3B (Map 3.6C).

Table 14.3.6C: Summary of Road Network Proposal at Ward no. 06

Road Width (in Feet)	Type of Road	Total		New Road		Road Widening	
		Length (km)	%	Length (km)	%	Length (km)	%
10	Local Road (as it is)	3.35	29.54	-	-	-	-
20	Tertiary Road	3.29	29.01	-	-	3.29	48.81
30		2.37	20.90	-	-	2.37	35.16
40	Secondary Road	0.45	3.97	-	-	0.45	6.68
60		-	-	-	-	-	-
80	Primary Road	1.88	16.59	1.25	100.00	0.63	9.35
160		-	-	-	-	-	-
Total		11.34	100.00	1.25	100.00	6.74	100.00

Source: Prepared by Consultants

Table 14.3.6D: Phasing of Road Network Proposal at Ward no. 06 of

Road ID	Road Type	Proposal	Width (ft)	Phasing
TR-471	Tertiary Road	Widening Road	20	Second Phase
TR-49	Tertiary Road	Widening Road	20	Second Phase
TR-50	Tertiary Road	Widening Road	20	Third Phasing
TR-51	Tertiary Road	Widening Road	20	Third Phasing
TR-52	Tertiary Road	Widening Road	20	Third Phasing
TR-53	Tertiary Road	Widening Road	20	Third Phasing
TR-54	Tertiary Road	Widening Road	20	Third Phasing
TR-478	Tertiary Road	Widening Road	30	Second Phase
TR-86	Tertiary Road	Widening Road	30	Second Phase
TR-90	Tertiary Road	Widening Road	30	Third Phasing
TR-91	Tertiary Road	Widening Road	30	Third Phasing
TR-92	Tertiary Road	Widening Road	30	Second Phase
TR-98	Tertiary Road	Widening Road	30	Third Phasing
SR-478	Secondary Road	Widening Road	40	First Phase
SR-479	Secondary Road	Widening Road	40	Third Phasing
SR-108	Secondary Road	Widening Road	60	First Phase
PR-114	Primary Road	Widening Road	80	First Phase
PR-115	Primary Road	Widening Road	80	First Phase
PR-482	Primary Road	New Road	80	First Phase

A total of 6.74 km of road widening has been proposed for this ward. Among these, 5.66km, 0.45 km and 0.63 km is respectively for tertiary, secondary and primary road.

14.3.6.3.4 Proposed Drainage Infrastructure Development

Existing drainage is mostly depending on natural drainage facilities. The proposed drainage facilities will be developed based on these natural channels. The primary drain (1.22 km) for the ward which will be connected by 0.07 km secondary drain and 5.86 km tertiary drain. Table 3.6.4 shows the detail Drainage Network of ward no. 06 in Chandanaish Pourashava (Map 3.6D).

Table 14.3.6E: Summary of Drainage Network Proposal at Ward no. 06

Drain Hierarchy	Drain Width (Meter)	Proposed Drain ID	Length (Km)
Primary Drain	1.50	PD-111	1.22
Sub-Total			1.22
Secondary Drain	1.00	SD-104	0.07
Sub-Total			0.07
Tertiary Drain	0.50	TD-39	0.58
	0.50	TD-44	0.25
	0.50	TD-73	1.00
	0.50	TD-41	0.13
	0.50	TD-40	0.25
	0.50	TD-42	0.72
	0.50	TD-43	0.66
	0.80	TD-88	0.27
	0.80	TD-89	0.19
	0.80	TD-96	0.08
	0.80	TD-97	0.16
	0.80	TD-94	1.57
Sub-Total			5.86
Grand Total			7.15

Source: Prepared by Consultants

14.3.6.3.5 Priority Tasks

The following priorities have been identified after the public consultation meeting at Chandanaish Pourashava. Among these tasks, activities under Priority-1 to be executed by first 5 years, actions under Priority-2 to be done by next 5 years and tasks under Priority-3 to be accomplished by last 10 years.

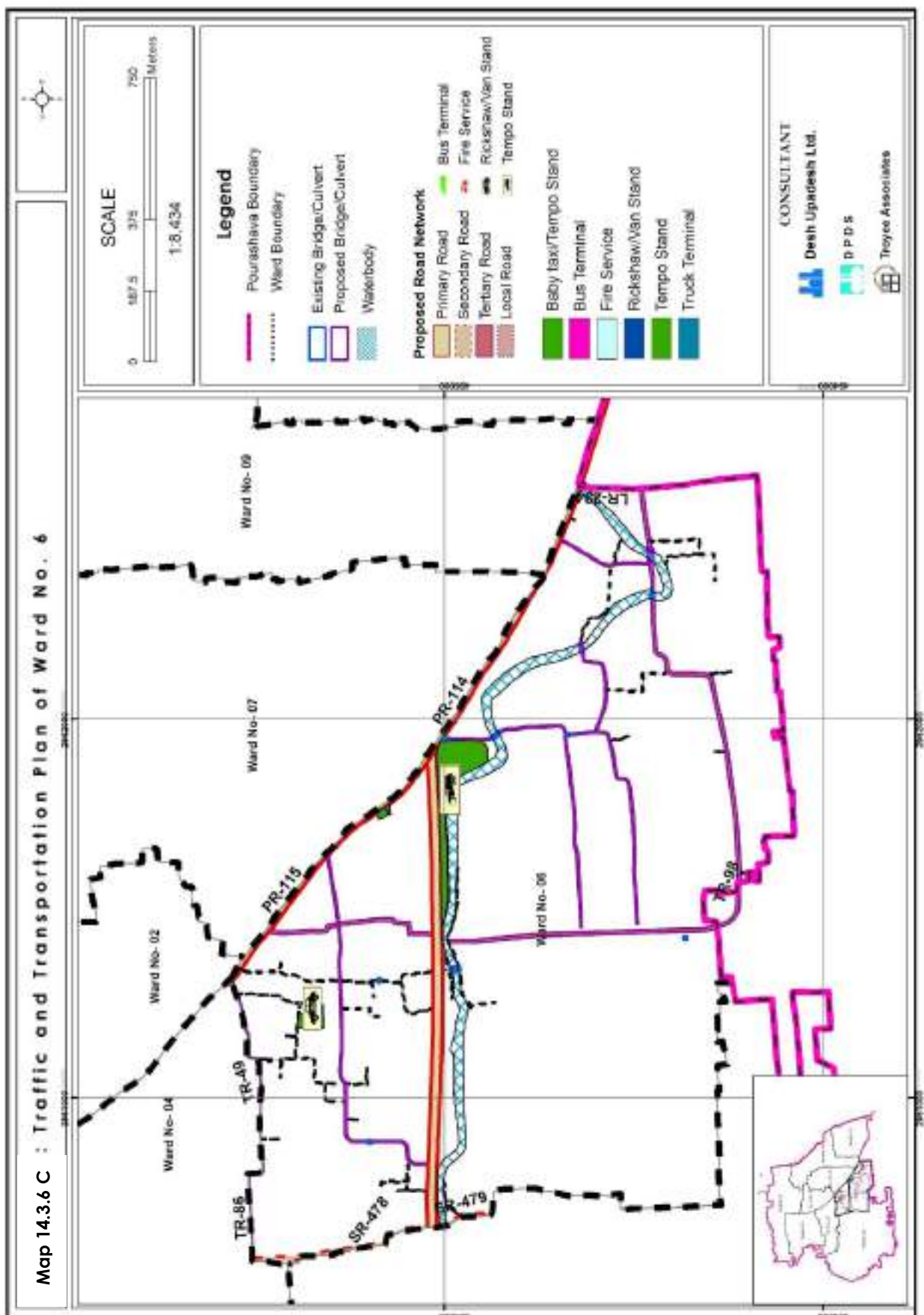
Table 14.3.6F: List of Priority Tasks has to be initiated by the Chandanaish Pourashava

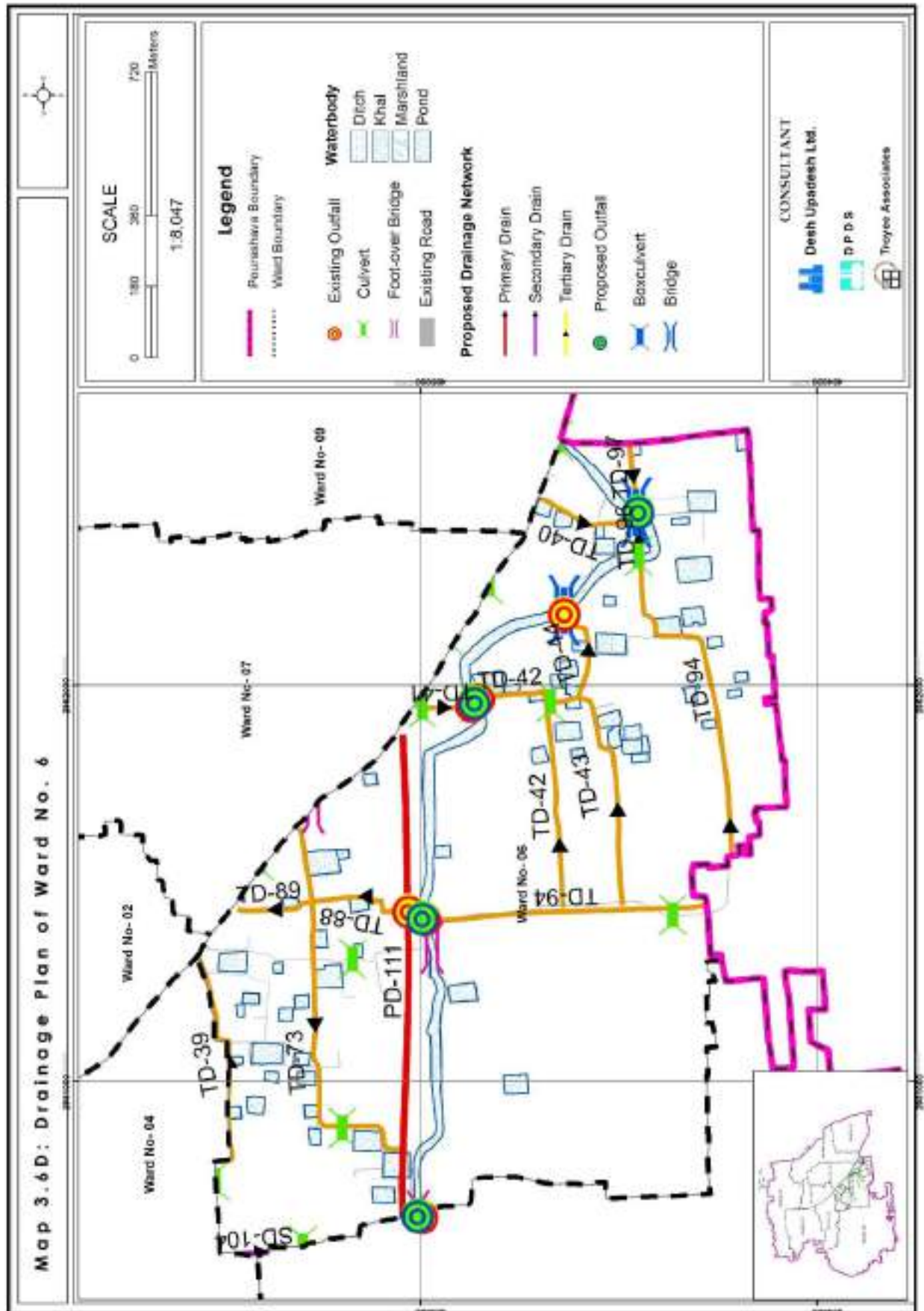
Priority-1		Priority-2		Priority-3	
Type of Construction	ID	Type of Construction	ID	Type of Construction	ID
Road Development	PR-114, PR-115, PR-482, SR-480	Road Development	TR-49, TR-86, TR-92, TR-471, TR-478	Road Development	LR-208, LR-209, LR-210, LR-211, LR-265, LR-266, LR-269, LR-270, LR-271, LR-279, LR-280, LR-281, LR-282, LR-283, LR-284, LR-285, LR-286, LR-287, LR-289, LR-290, LR-291, LR-292, LR-293, LR-294, LR-295, LR-296, LR-297, LR-298, LR-299, LR-300, LR-301, LR-302, LR-453, SD-481, TR-50, TR-51, TR-52, TR-53, TR-54, TR-90, TR-91, TR-98
Drain	PD-111	Drain	SD-104	Drain	TD-39, TD-44, TD-73, TD-88, TD-89, TD-96, TD-97, TD-41, TD-40, TD-42, TD-43, TD-94
Other Facilities	Rickshaw/ Van Stand, Tempo	Other Facilities	Madrasha, College, Park	Other Facilities	Agri Extension Farm, Jail/Sub-Jail,

Priority-1		Priority-2		Priority-3	
Type of Construction	ID	Type of Construction	ID	Type of Construction	ID
	Stand, Madrasha, Primary School, Retail Market				Madrasha, Tempo Stand, Wholesale Market

Source: Prepared by consultants'

Plot wise specific development proposal is attached in *Annex-7*, list of road inventory and drainage inventory is given in *Annex-8 and Annex-9* respectively.





14.3.7: Action Plan for Ward 07

14.3.7.1 Criteria for the Plan Proposal

Demography

Ward No. 7 is located on the mid south-east part of the Pourashava. As per the pourashava population census data of 2011, the Ward no. 07 had a population of 7452 persons. Family size was 6; sex ratio was same with male and female. Population projection shows 8028 population for the year 2016. For the same year, it has a gross density of about 27 persons per acre and it will be 33 persons per acre in 2031. *Table 3.7.1* shows the detail.

Table 14.3.7A: Population Statistics of Ward no. 07

Item	Year				
	2011	2016	2021	2026	2031
Area (Acre)	302.17	302.17	302.17	302.17	302.17
Population	7,452	8,028	8,648	9,317	10,037
Population Density per acre	25	27	29	31	33

Source: Chandanaish Pourashava, 2011

14.3.7.2 Critical Issues and Opportunities of the ward

Critical Issues

Ward No. 7 is the mid south-east part of the Chandanaish Pourashava with characteristics of some urban and mostly predominant rural activities. It has the following critical issues,

- Lack of basic facilities and infrastructures required for an urban area.
- There is no systematic drainage and solid waste management facilities.
- Lack of adequate road.
- There is no water supply network at this ward.
- There is lack of commercial, open space, recreational, educational and social gathering facilities.

Development Opportunities

Due to low density of population and having external road linkage of the pourashava by Chittagong-Cox's Bazar highway i.e. Arakan Road creates development opportunity of this ward. The development opportunities are as follows,

- From environmental point of view, low density population can create a very livable environment for the area with respect to ventilation, use of road and other basic services.
- Some khals inside of Chandanaish Pourashava plays an important role in drainage system.
- Chittagong-Cox's Bazar highway i.e. Arakan Road also plays pivotal role to develop different facilities due to tourist attracting zone of Cox's Bazar, Teknaf and Saint Martin as well as Landport of Teknaf.

14.3.7.3 Proposals and Plan for Ward no. 07

14.3.7.3.1 Review of Existing Land Use

Ward no. 07 is mostly rural but only a few areas urban in character. Out of total 302.16 acres of land of this ward, around 164.90 acres of land i.e. 54.57% is reserved for agriculture. In existing land uses, both the urban residential and rural homestead has been considered as residential use as a whole. The residential use with 75.10 acres, occupies 24.85% of total land, water bodies 15.38% and circulation network 2.32%. No land is used as government service. There is only 1.81% land for urban green space and recreational facilities. No other notable type of land uses are found in this ward. *Table 3.7.2* shows the existing and proposed land use pattern of the ward (*Map 3.7A and Map 3.7B*).

14.3.7.3.2 Proposed Land Use Zoning

The category wise proposals are presented here. *Table 3.7.2* shows the amount of land existing and proposed uses in Ward No. 7.

i. Urban Residential Zone

At present around 75.10 acres land is occupied by urban residential use as a whole. In Ward Action Plan of Ward 07, around 89.83 acre of land has been earmarked for urban residential use which will occupy 29.44% of the total land in Ward 07.

ii. Rural Settlement

As this Ward is predominantly rural in character, a large portion of land like 57.85 acres (18.96%) of land is proposed for rural settlement up to the year 2031.

Table 14.3.7B: Summary of the Existing Land uses and Proposed Land uses

Sl. No.	Existing Landuse	Area in Acres	%	Sl. No.	Proposed General Landuse	Area in Acres	%
1	Residential	75.10	24.85	1	Urban Residential Area	89.83	29.44
				2	Rural Settlement	57.85	18.96
2	Education and Research	1.04	0.34	3	Education and Research	9.01	2.95
3	Governmental Services	-	-	4	Governmental Office	1.12	0.37
4	Non Government Services	-	-	5	Health Services	3.18	1.04
5	Commercial Activity	1.00	0.33	6	Commercial Zone	0.69	0.23
6	Manufacturing and Processing Activity	-	-	7	General Industry	-	-
7	Mixed Use	-	-	8	Mixed Use	-	-
8	Circulation Network	7.00	2.32	9	Circulation Network	26.04	8.53
9	Transport and Communication	-	-	10	Transport and Communication	-	-
10	Service Activity	-	-	11	Utility Services	-	-
11	Community Facilities	1.18	0.39	12	Community Facilities	2.14	0.70
12	Recreational Facilities	-	-	13	Recreational Facilities	-	-
13	Restricted Area	-	-	14	Restricted Area	-	-
14	Agriculture	164.90	54.57	15	Agriculture	62.46	20.47
15	Urban Green Space	5.48	1.81	16	Urban Green/ Open Space	9.54	3.13
16	Water Bodies	46.46	15.38	17	Water Bodies	29.69	9.73
17	Vacant Land	-	-	18	Historical & Heritage	-	-
18	Forest	-	-	19	Forest	-	-
19	Miscellaneous	-	-	20	Miscellaneous	-	-
				21	Urban Deferred	13.63	4.47
Total		302.16	100	Total		302.16	100

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

iii. Education and Research

In Ward Action Plan, one high school, one college and a madrasa is proposed which comprises an area of 7.62 acres.

iv. Government office

In Ward No. 7, a ward councilor's office with an area of 1.12 acres has been proposed as a ward center. *Table 3.7.2* has shown in detail and *Annex-7* shows the mouza wise plot proposal of the ward councilor's office of Ward No. 7.

v. Commercial Activity

At present, commercial activity and density of population are very low in this ward. Only 0.69 acres of land has been proposed for this purpose.

vi. 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 26.04 acres of land and about 8.53% of the total area that is more workable for this ward.

vii. Community Facilities

Land for community facilities will be 2.14 acre (0.70%) whereas present land for this purpose in this ward is 1.18 acres. A community center beside proposed ward councilor's office and an eidgah of total 1.06 acres has been proposed here.

viii. Agricultural Area

The total area under this use in Ward 07 has been estimated about 62.46 acres of land covering 20.47% of the total land of this ward.

ix. Open Space & Recreational Facilities

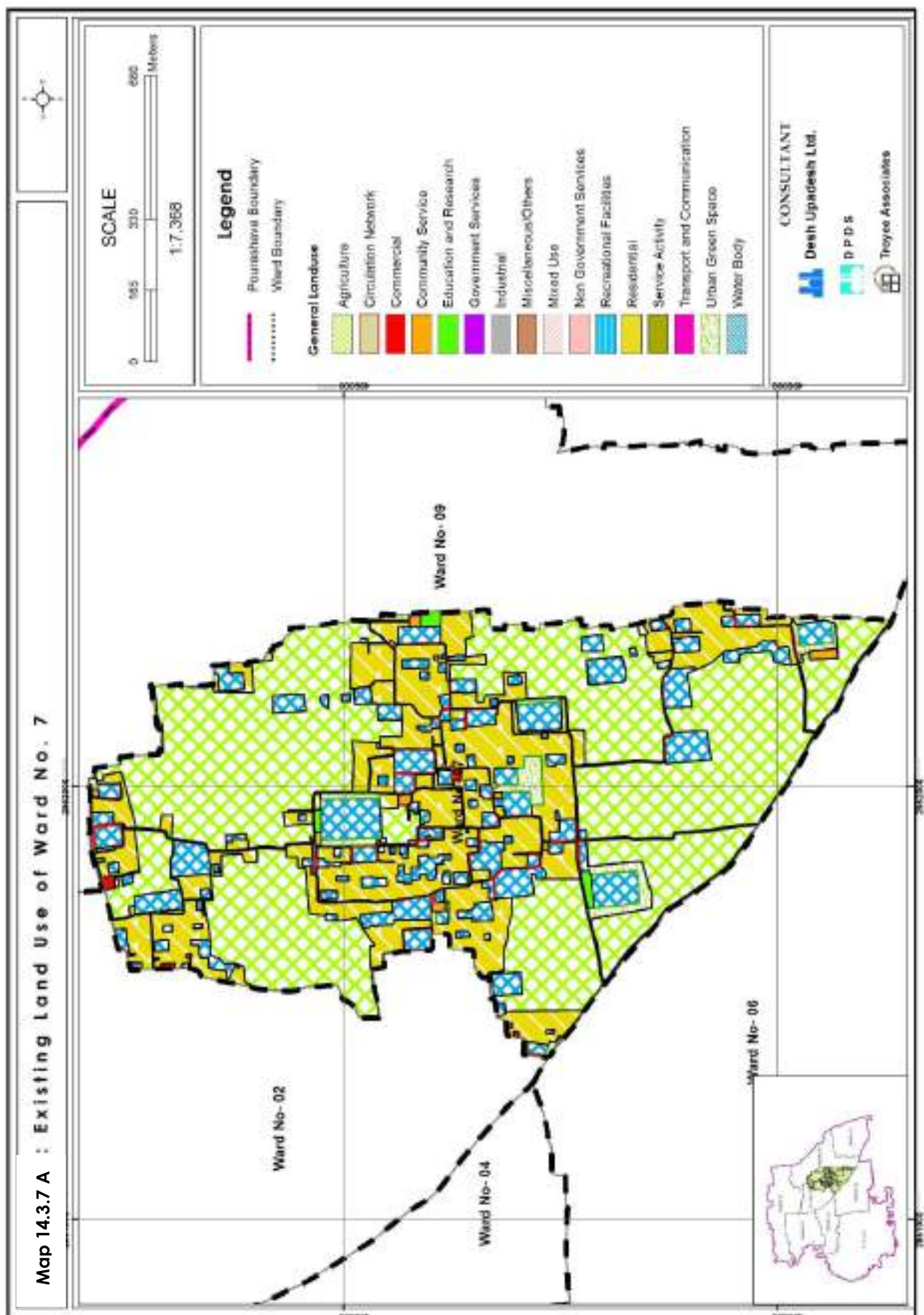
Land for open space will be 9.54 acres (3.13%) which includes open recreational facilities like playground.

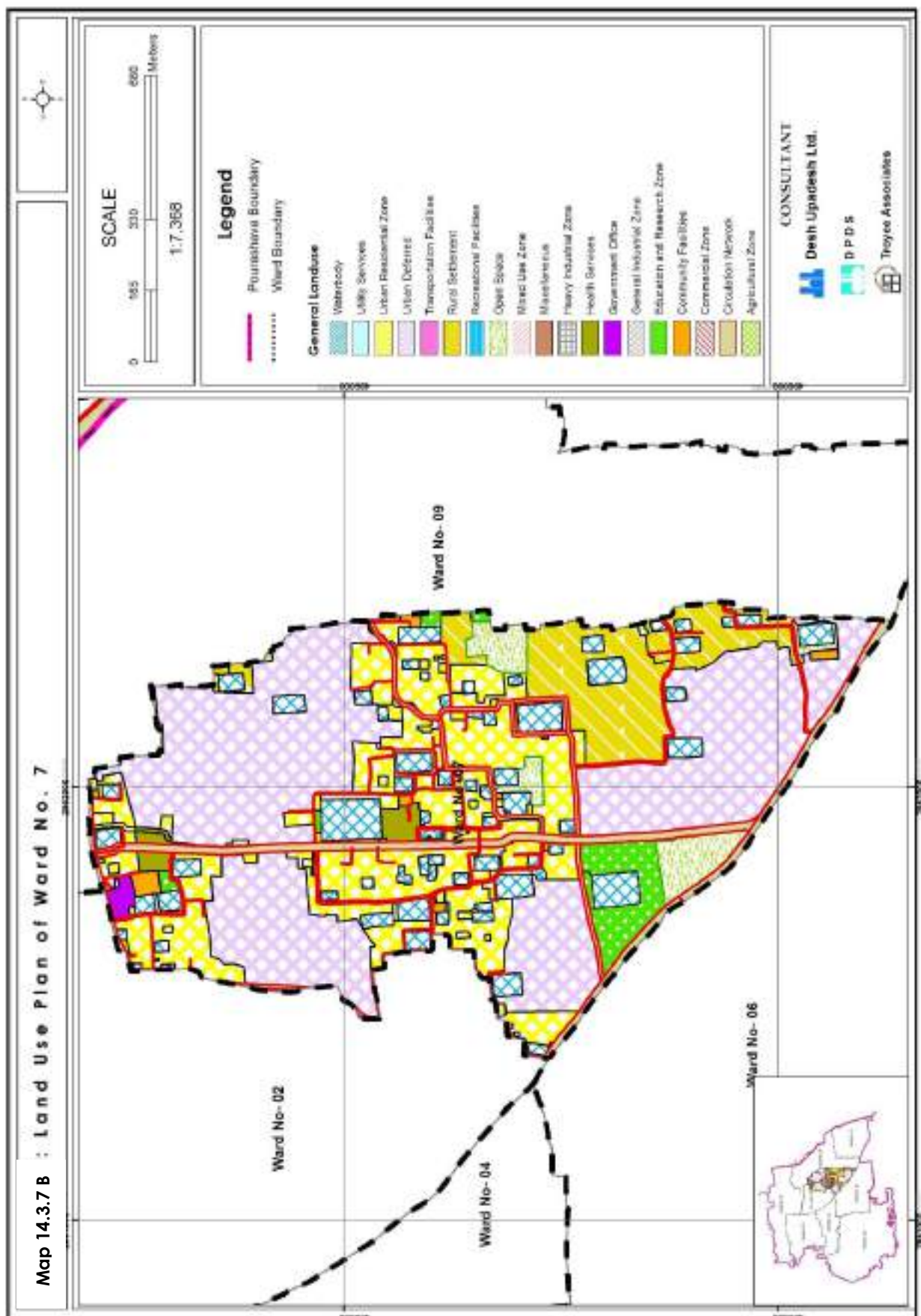
x. Water bodies

The proposed retention area (Water bodies) covers almost 29.69 acres of land which covers 9.73% of the total ward area. All of the existing water bodies like khal, river, pond, ditch etc have tried to preserve as possible.

xi. Utility Services Zone

No land is earmarked as Utility Services zone at Ward no. 07.





14.3.7.3.3 Proposed Road Infrastructure Development

A total of 8.75 km of road development has been proposed in first ward action plan for Ward no. 07 of Chandanaish Pourashava. Length of the access road (local road) will be 2.08 km and width of these roads will be 10 ft which covers 23.76% of total road network development proposal. Total length of tertiary (20 ft and 30 ft) and secondary road (40 ft and 60 ft) will be 4.08 km and 1.80 km respectively. The rest 0.79 km primary road will be developed and its width will be 80 ft. The detailed scenario of road network development proposal is given in *Table 3.7.3A and 3.7.3B (Map 3.7C)*.

Table 14.3.7C: Summary of Road Network Proposal at Ward no. 07

Road Width (in Feet)	Type of Road	Total		New Road		Road Widening	
		Length (km)	%	Length (km)	%	Length (km)	%
10	Local Road (as it is)	2.08	23.76	-	-	-	-
20	Tertiary Road	2.74	31.30	-	-	2.74	41.05
30		1.34	15.31	-	-	1.34	20.08
40	Secondary Road	0.27	3.07	-	-	0.27	4.03
60		1.54	17.53	-	-	1.54	23.00
80	Primary Road	0.79	9.02	-	-	0.79	11.84
160		-	-	-	-	-	-
Total		8.75	100.00	-	-	6.67	100.00

Source: Prepared by Consultants

Table 14.3.7D: Phasing of Road Network Proposal at Ward no. 07

Road ID	Road Type	Proposal	Width (ft)	Phasing
TR-11	Tertiary Road	Widening Road	20	Third Phasing
TR-12	Tertiary Road	Widening Road	20	Third Phasing
TR-13	Tertiary Road	Widening Road	20	Third Phasing
TR-16	Tertiary Road	Widening Road	20	Third Phasing
TR-17	Tertiary Road	Widening Road	20	Third Phasing
TR-18	Tertiary Road	Widening Road	20	Third Phasing
TR-55	Tertiary Road	Widening Road	20	Third Phasing
TR-68	Tertiary Road	Widening Road	20	Third Phasing
TR-87	Tertiary Road	Widening Road	30	Second Phase
TR-88	Tertiary Road	Widening Road	30	Third Phasing
TR-96	Tertiary Road	Widening Road	30	Second Phase
TR-97	Tertiary Road	Widening Road	30	Third Phasing
SR-106	Secondary Road	Widening Road	40	First Phase
SR-108	Secondary Road	Widening Road	60	First Phase
PR-114	Primary Road	Widening Road	80	First Phase
PR-115	Primary Road	Widening Road	80	First Phase

A total of 6.67 km of road widening has been proposed for this ward. Among these, 4.08 km, 1.80 km and 0.79 km is respectively for tertiary, secondary and primary road.

14.3.7.3.4 Proposed Drainage Infrastructure Development

Existing drainage is mostly depending on natural drainage facilities. The proposed drainage facilities will be developed based on these natural channels. The primary drain (2.80 km) for the ward which will be connected by 0.46 km secondary drain and 4.56 km tertiary drain. *Table 3.7.4* shows the detail Drainage Network of ward no. 07 in Chandanaish Pourashava (*Map 3.7D*).

Table 14.3.7E: Summary of Drainage Network Proposal at Ward no. 07

Drain Hierarchy	Drain Width (Meter)	Proposed Drain ID	Length (Km)
Primary Drain	1.50	PD-112	1.51
	1.50	PD-118	0.86
	1.50	PD-119	0.43
Sub-Total			2.80
Secondary Drain	1.00	SD-105	0.46
Sub-Total			0.46
Tertiary Drain	0.50	TD-14	0.69
	0.50	TD-15	0.33
	0.50	TD-17	0.14
	0.50	TD-18	0.20
	0.50	TD-58	0.88
	0.50	TD-16	0.09
	0.50	TD-45	1.05
	0.80	TD-87	0.32
	0.80	TD-92	0.55
	0.80	TD-93	0.31
Sub-Total			4.56
Grand Total			7.82

Source: Prepared by Consultants

14.3.7.3.5 Priority Tasks

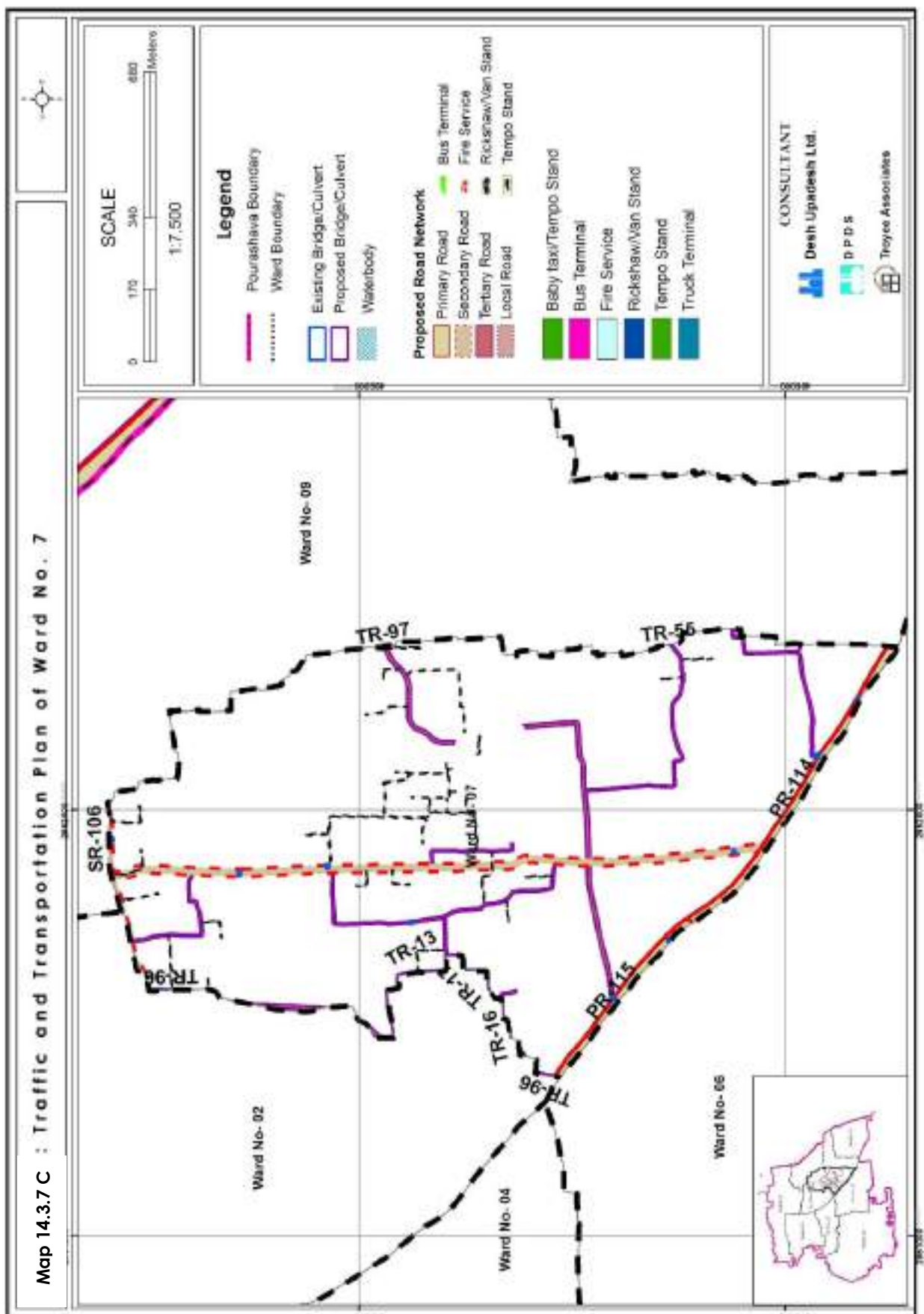
The following priorities have been identified after the public consultation meeting at Chandanaish Pourashava. Among these tasks, activities under Priority-1 to be executed by first 5 years, actions under Priority-2 to be done by next 5 years and tasks under Priority-3 to be accomplished by last 10 years.

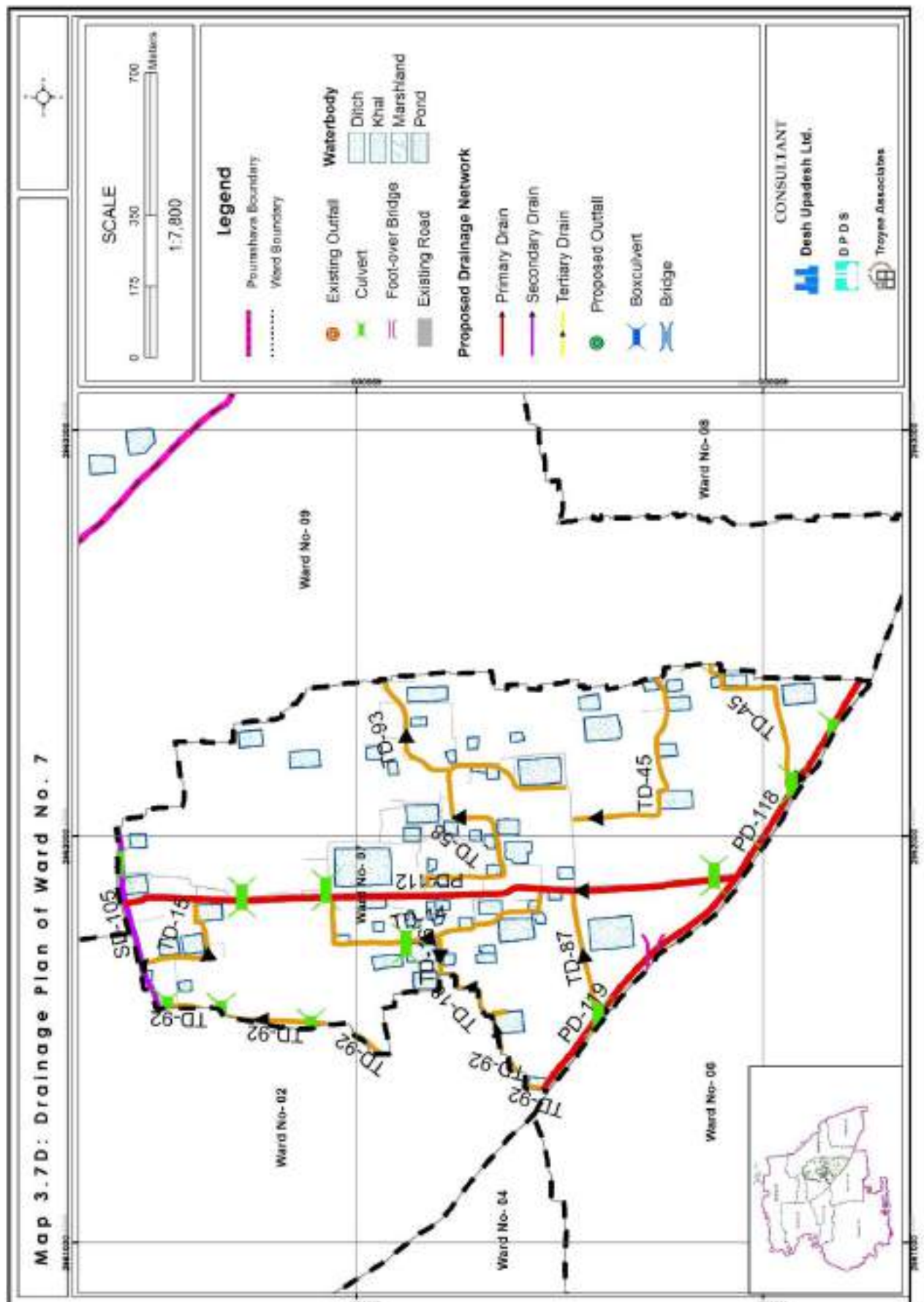
Table 14.3.7F: List of Priority Tasks has to be initiated by the Chandanaish Pourashava

Priority-1		Priority-2		Priority-3	
Type of Construction	ID	Type of Construction	ID	Type of Construction	ID
Road Development	PR-114, PR-115, SR-108, SR-110	Road Development	TR-87, TR-96	Road Development	LR-346, LR-347, LR-351, LR-352, LR-364, LR-380, LR-426, LR-427, LR-428, LR-429, LR-430, LR-431, LR-432, LR-433, LR-434, LR-435, LR-436, LR-437, LR-438, LR-439, LR-440, LR-441, LR-442, LR-444, LR-445, LR-451, TR-11, TR-12, TR-13, TR-16, TR-17, TR-18, TR-55, TR-68, TR-88, TR-97
Drain	PD-112, PD-118, PD-119	Drain	SD-105	Drain	TD-14, TD-15, TD-17, TD-18, TD-58, TD-87, TD-16, TD-45, TD-92, TD-93
Other Facilities	Community Centre, Ward Office, Community Clinic, High School	Other Facilities	Community Clinic, Library, Low Income Housing	Other Facilities	Community Clinic, Private Housing

Source: Prepared by consultants'

Plot wise specific development proposal is attached in Annex-7, list of road inventory and drainage inventory is given in Annex-8 and Annex-9 respectively.





14.3.8: Action Plan for Ward 08

14.3.8.1 Criteria for the Plan Proposal

Demography

Ward no. 8 is located on the most south-east part of the Pourashava. As per the pourashava population census data of 2011, the Ward No. 08 had a population of 12002 persons. Family size was 6; sex ratio was same with male and female. Population projection shows 12930 population for the year 2016. For the same year, it has a gross density of about 30 persons per acre and it will be 40 persons per acre in 2031. *Table 3.8.1* shows the detail.

Table 14.3.8A: Population Statistics of Ward No. 08

Item	Year				
	2011	2016	2021	2026	2031
Area (Acre)	404.90	404.90	404.90	404.90	404.90
Population	12,002	12,930	13,929	15,005	16,165
Population Density per acre	30	32	34	37	40

Source: Chandanaish Pourashava, 2011

14.3.8.2 Critical Issues and Opportunities of the ward

Critical Issues

Ward no. 8 is the most south-east part of the Chandanaish Pourashava with characteristics of some urban and mostly predominant rural activities. It has the following critical issues,

- Lack of basic facilities and infrastructures required for an urban area.
- There is no systematic drainage and solid waste management facilities.
- Lack of adequate road.
- There is no water supply network at this ward.
- There is lack of commercial, open space, recreational, educational and social gathering facilities.

Development Opportunities

Due to low density of population and having external road linkage of the pourashava by Chittagong-Cox's Bazar highway i.e. Arakan Road creates development opportunity of this ward. The development opportunities are as follows,

- From environmental point of view, low density population can create a very livable environment for the area with respect to ventilation, use of road and other basic services.
- Some khals inside of Chandanaish Pourashava plays an important role in drainage system.
- Chittagong-Cox's Bazar highway i.e. Arakan Road also plays pivotal role to develop different facilities due to tourist attracting zone of Cox's Bazar, Teknaf and Saint Martin as well as Landport of Teknaf.

14.3.8.3 Proposals and Plan for Ward No. 08

14.3.8.3.1 Review of Existing Land Use

Ward No. 08 is mostly rural but only a few areas urban in character. Out of total 709.54 acres of land of this ward, around 463.99 acres of land i.e. 65.39% is reserved for agriculture. In existing land uses, both the urban residential and rural homestead has been considered as residential use as a whole. The residential use with 117.29 acres, occupies 16.53% of total land, water bodies 14.10%, circulation network 1.42% and commercial activities 1.03%. Only 0.22% of land is used as government service. There is only 0.42% land for urban green space and recreational facilities. No other notable type of land uses are found in this ward. Table 3.8.2 shows the existing and proposed land use pattern of the ward (Map 3.8A and Map 3.8B).

14.3.8.3.2 Proposed Land Use Zoning

The category wise proposals are presented here. Table 3.8.2 shows the amount of land existing and proposed uses in Ward no. 8.

i. Urban Residential Zone

At present no land is occupied by urban residential use as a whole. Thus, in Ward Action Plan of Ward 08, no land has been earmarked for urban residential use.

ii. Rural Settlement

As this Ward is predominantly rural in character, a large portion of land like 158.25 acres (39.02%) of land is proposed for rural settlement up to the year 2031.

Table 14.3.8B: Summary of the Existing Land uses and Proposed Land uses

Sl. No.	Existing Landuse	Area in Acres	%	Sl. No.	Proposed General Landuse	Area in Acres	%
1	Residential	87.41	21.59	1	Urban Residential Area	0.00	0.00
				2	Rural Settlement	158.25	39.02
2	Education and Research	3.61	0.89	3	Education and Research	6.10	1.50
3	Governmental Services	-	-	4	Governmental Office	1.36	0.34
4	Non Government Services	-	-	5	Health Services	6.84	1.69
5	Commercial Activity	7.23	1.79	6	Commercial Zone	6.09	1.50
6	Manufacturing and Processing Activity	0.36	0.09	7	General Industry	65.98	16.27
7	Mixed Use	-	-	8	Mixed Use	-	-
8	Circulation Network	9.99	2.47	9	Circulation Network	32.79	8.09
9	Transport and Communication	-	-	10	Transport and Communication	0.02	0.01
10	Service Activity	-	-	11	Utility Services	-	-
11	Community Facilities	2.58	0.64	12	Community Facilities	3.17	0.78
12	Recreational Facilities	-	-	13	Recreational Facilities	-	-
13	Restricted Area	-	-	14	Restricted Area	-	-
14	Agriculture	229.07	56.57	15	Agriculture	61.92	15.27
15	Urban Green Space	5.98	1.48	16	Urban Green/ Open Space	19.50	4.81
16	Water Bodies	58.67	14.49	17	Water Bodies	43.54	10.74
17	Vacant Land	-	-	18	Historical & Heritage	-	-
18	Forest	-	-	19	Forest	-	-
19	Miscellaneous	-	-	20	Miscellaneous	-	-
				21	Urban Deferred	-	-
Total		404.90	100	Total		404.90	100

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

iii. Education and Research

In Ward Action Plan, one high school is proposed which comprises an area of 2.17 acres.

iv. Government office

In ward no. 8, a ward councilor's office with an area of 0.61 acres of land has been proposed as a ward center. *Table 3.8.2* has shown in detail and *Annex-7* shows the mouza wise plot proposal of the ward councilor's office of Ward no. 8.

v. Commercial Activity

At present, commercial activity and density of population are very low in this ward. Only 6.09 acres of land has been proposed for this purpose.

vi. 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 32.79 acres of land and about 8.09% of the total area that is more workable for this ward.

vii. Community Facilities

Land for community facilities will be 3.17 acre (0.78%) whereas present land for this purpose in this ward is 2.58 acres. A community center of 0.83 acres has been proposed here beside proposed ward councilor's office.

viii. Agricultural Area

The total area under this use in Ward 08 has been estimated about 61.92 acres of land covering 15.27% of the total land of this ward.

ix. Open Space & Recreational Facilities

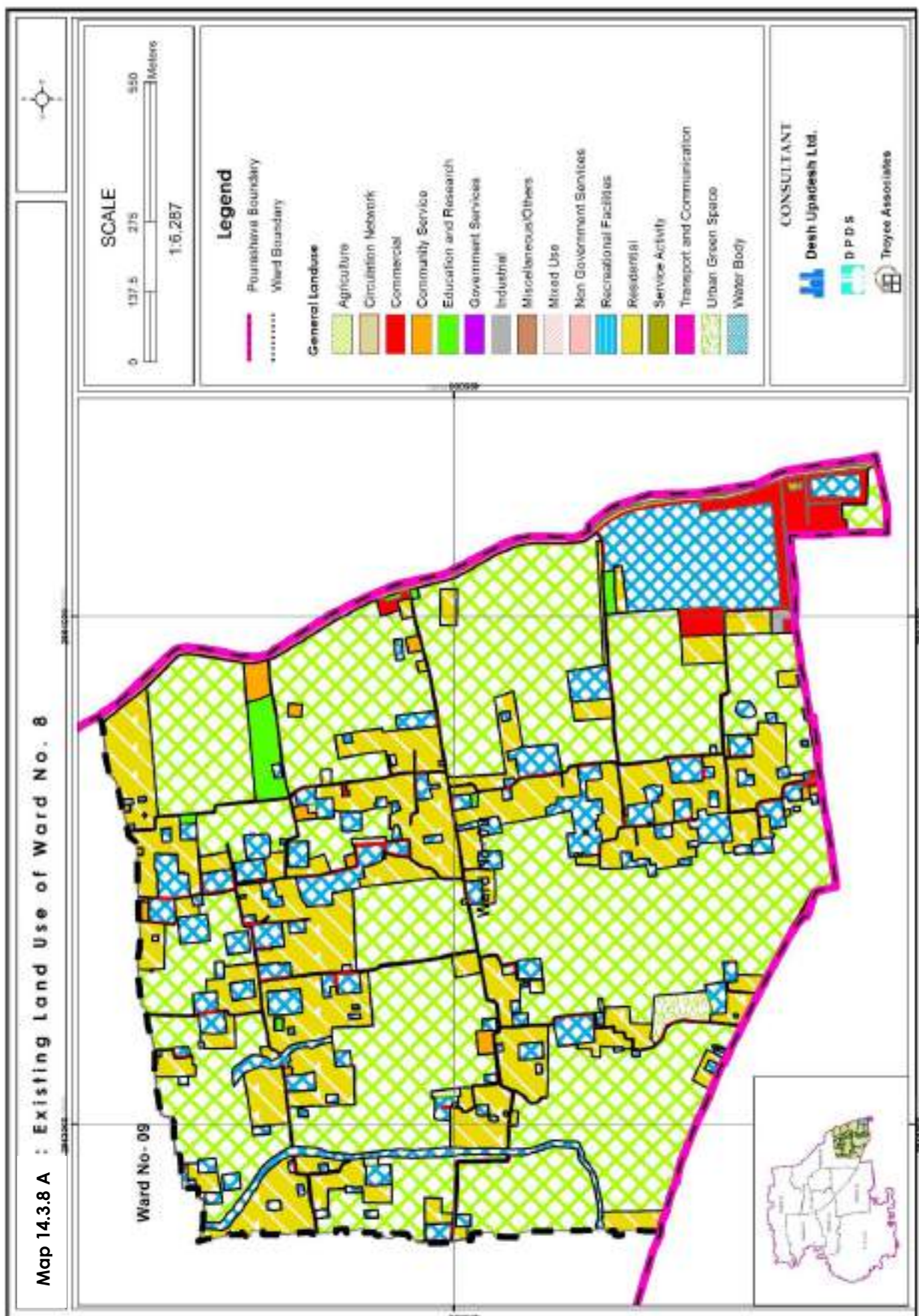
Land for open space will be 19.50 acres (4.81%) which includes open recreational facilities like playground and park.

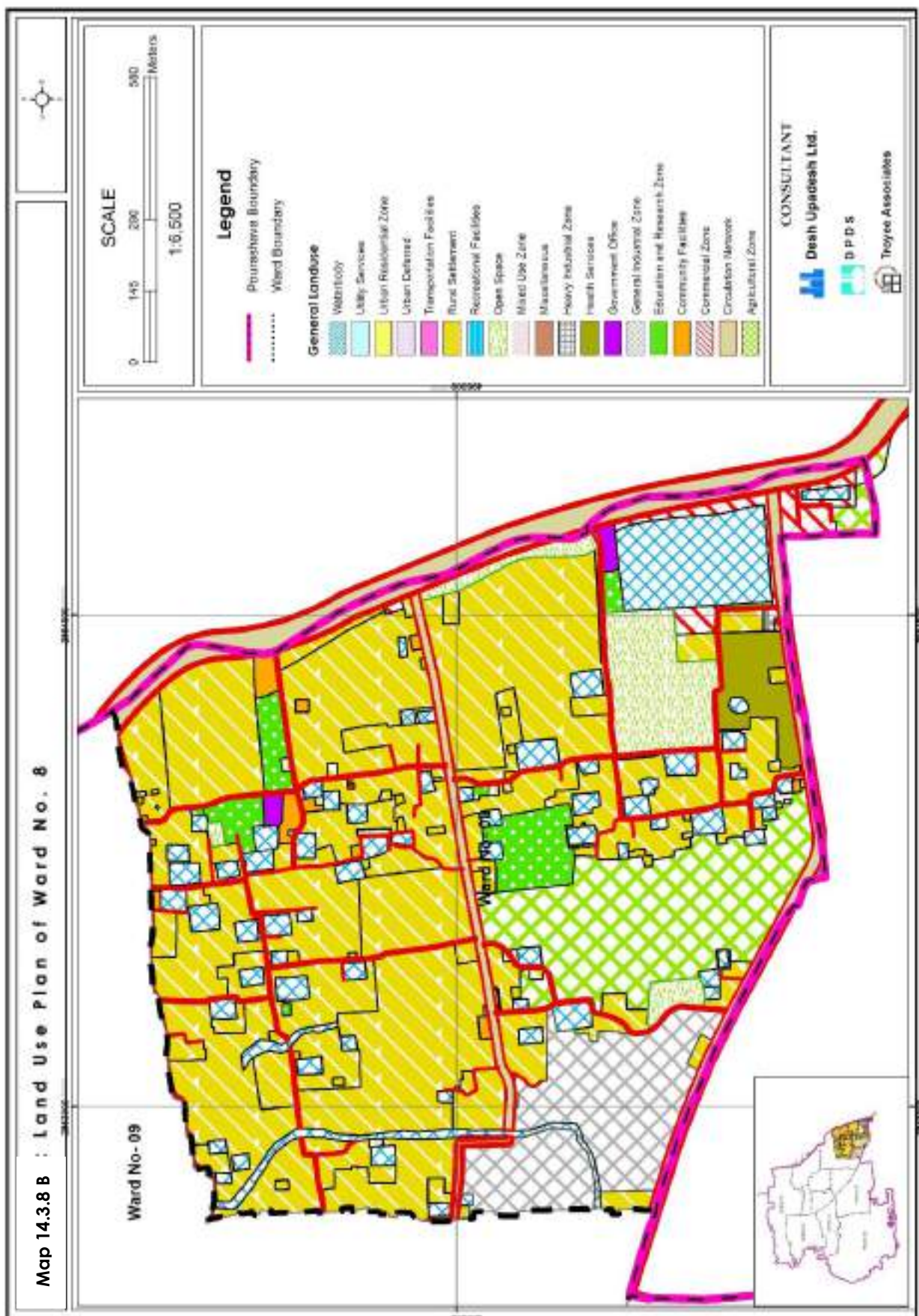
x. Water bodies

The proposed retention area (Water bodies) covers almost 43.54 acres of land which covers 10.74% of the total ward area. All of the existing water bodies like khal, river, pond, ditch etc have tried to preserve as possible.

xi. Utility Services Zone

No total land is earmarked as Utility Services zone at Ward No. 08.





14.3.8.3.3 Proposed Road Infrastructure Development

A total of 12.26 km of road development has been proposed in first ward action plan for Ward No. 08 of Chandanaish Pourashava. Length of the access road (local road) will be 1.52 km and width of these roads will be 10 ft which covers 12.40% of total road network development proposal. Total length of tertiary (20 ft and 30 ft) and secondary road (40 ft and 60 ft) will be 7.70 km and 1.38 km respectively. The rest 1.66 km primary road will be developed and its width will be 80-160 ft at different locations. The detailed scenario of road network development proposal is given in Table 3.8.3A and 3.4.3B (Map 3.8C).

Table 14.3.8C: Summary of Road Network Proposal at Ward No. 08

Road Width (in Feet)	Type of Road	Total		New Road		Road Widening	
		Length (km)	%	Length (km)	%	Length (km)	%
10	Local Road (as it is)	1.52	12.40	-	-	-	-
20	Tertiary Road	7.43	60.62	-	-	7.43	69.20
30		0.27	2.20	-	-	0.27	2.51
40	Secondary Road	-	-	-	-	-	-
60		1.38	11.26	-	-	1.38	12.85
80	Primary Road	1.07	8.71	-	-	1.07	9.94
160		0.59	4.81	-	-	0.59	5.50
Total		12.26	100.00	-	-	10.74	100.00

Source: Prepared by Consultants

Table 14.3.8D: Phasing of Road Network Proposal at Ward No. 08

Road ID	Road Type	Proposal	Width (ft)	Phasing
TR-19	Tertiary Road	Widening Road	20	Second Phase
TR-2	Tertiary Road	Widening Road	20	Second Phase
TR-24	Tertiary Road	Widening Road	20	Second Phase
TR-25	Tertiary Road	Widening Road	20	Second Phase
TR-26	Tertiary Road	Widening Road	20	Second Phase
TR-27	Tertiary Road	Widening Road	20	Second Phase
TR-28	Tertiary Road	Widening Road	20	Third Phasing
TR-29	Tertiary Road	Widening Road	20	Third Phasing
TR-30	Tertiary Road	Widening Road	20	Third Phasing
TR-31	Tertiary Road	Widening Road	20	Third Phasing
TR-467	Tertiary Road	Widening Road	20	Second Phase
TR-69	Tertiary Road	Widening Road	20	Second Phase
TR-71	Tertiary Road	Widening Road	20	Second Phase
TR-73	Tertiary Road	Widening Road	20	Second Phase
TR-74	Tertiary Road	Widening Road	20	Second Phase
TR-75	Tertiary Road	Widening Road	20	Third Phasing
TR-76	Tertiary Road	Widening Road	20	Third Phasing
TR-77	Tertiary Road	Widening Road	20	Third Phasing
TR-93	Tertiary Road	Widening Road	30	Third Phasing
SR-108	Secondary Road	Widening Road	60	First Phase
SR-6	Secondary Road	Widening Road	60	First Phase
SR-7	Secondary Road	Widening Road	60	First Phase
PR-114	Primary Road	Widening Road	80	First Phase
PR-469	Primary Road	Widening Road	160	Second Phase

A total of 10.74 km of road widening has been proposed for this ward. Among these, 7.70 km, 1.38 km and 1.66 km is respectively for tertiary, secondary and primary road. Table 3.8.3 shows the details.

14.3.8.3.4 Proposed Drainage Infrastructure Development

Existing drainage is mostly depending on natural drainage facilities. The proposed drainage facilities will be developed based on these natural channels. The primary drain (4.52 km) will be connected by 6.45 km tertiary drain. Table 3.8.4 shows the detail Drainage Network of Ward No. 08 in Chandanaish Pourashava (Map 3.8D).

Table 14.3.8E: Summary of Drainage Network Proposal at Ward No. 08

Drain Hierarchy	Drain Width (Meter)	Proposed Drain ID	Length (Km)
Primary Drain	1.50	PD-120	1.11
	1.50	PD-109	0.27
	1.50	PD-110	1.60
	1.50	PD-118	1.54
Sub-Total			4.52
Tertiary Drain	0.50	TD-25	0.34
	0.50	TD-26	0.45
	0.50	TD-27	0.30
	0.50	TD-28	0.46
	0.50	TD-29	0.15
	0.50	TD-30	0.64
	0.50	TD-31	0.34
	0.50	TD-54	0.16
	0.50	TD-62	0.33
	0.50	TD-63	0.44
	0.50	TD-64	0.54
	0.50	TD-65	0.21
	0.50	TD-66	0.52
	0.50	TD-74	0.42
	0.50	TD-19	0.00
	0.50	TD-24	0.17
	0.50	TD-59	0.02
	0.50	TD-60	0.96
Sub-Total			6.45
Grand Total			10.97

Source: Prepared by Consultants

14.3.8.3.5 Priority Tasks

The following priorities has been identified after the public consultation meeting at Chandanaish Pourashava. Among these tasks, activities under Priority-1 to be executed by first 5 years, actions under Priority-2 to be done by next 5 years and tasks under Priority-3 to be accomplished by last 10 years.

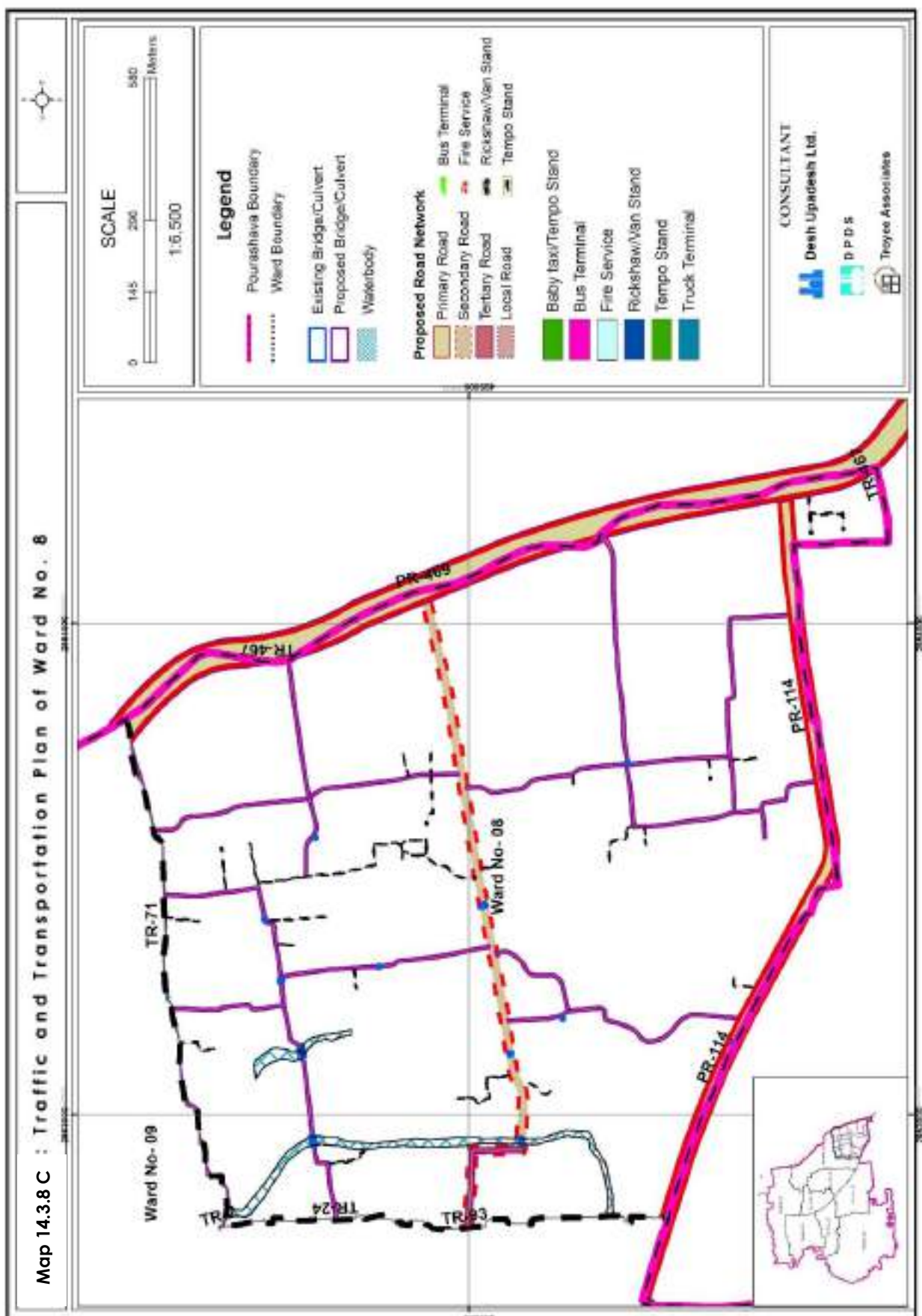
Table 14.3.8F: List of Priority Tasks has to be initiated by the Chandanaish Pourashava

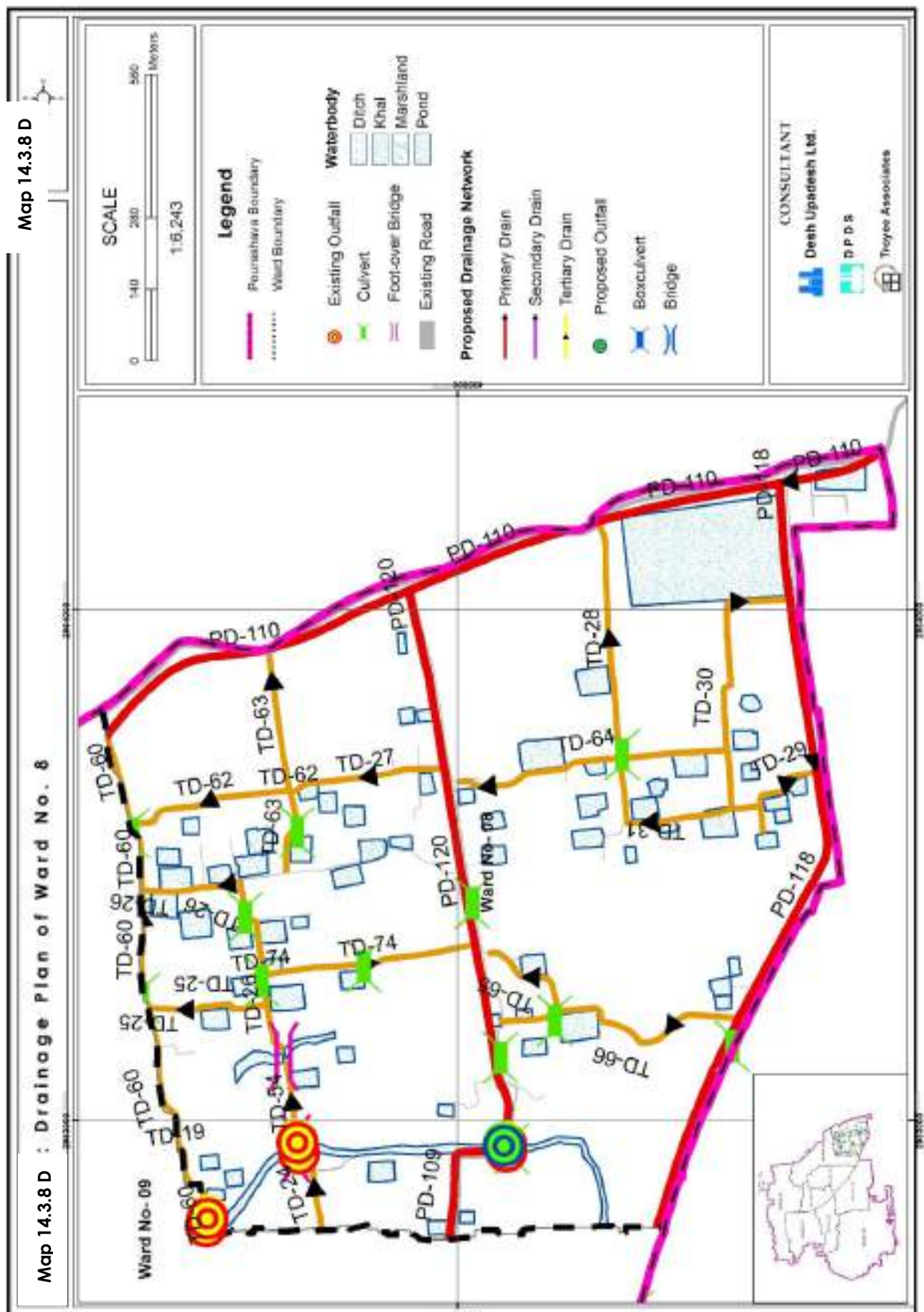
Priority-1		Priority-2		Priority-3	
Type of Construction	ID	Type of Construction	ID	Type of Construction	ID
Road Development	PR-114, SR-6, SR-7	Road Development	PR-469, TR-2, TR-19, TR-24, TR-25, TR-26, TR-27, TR-69, TR-71, TR-73, TR-74, TR-467	Road Development	LD-396, LD-398, LD-399, LD-400, LD-401, LD-402, LD-403, LD-404, LD-405, LD-406, LD-407, LD-408, LD-409, LD-410, LD-411, LD-412, LD-413, LD-414, LD-415, LD-416, LD-417, LD-418, LD-421, LD-422, LD-452, TR-28, TR-29, TR-30

Priority-1		Priority-2		Priority-3	
Type of Construction	ID	Type of Construction	ID	Type of Construction	ID
					TR-31, TR-75 TR-76, TR-77 TR-93
Drain	PD-120, PD-109 PD-110, PD-118	Drain	-	Drain	TD-25, TD-26 TD-27, TD-28 TD-29, TD-30 TD-31, TD-54 TD-62, TD-63 TD-64, TD-65 TD-66, TD-74 TD-19, TD-24 TD-59, TD-60
Other Facilities	Community Centre, Health Complex, High School, Ward Office	Other Facilities	Madrasa, Agro-based Industry, Park	Other Facilities	Small Scale Industry

Source: Prepared by consultants'

Plot wise specific development proposal is attached in *Annex-7*, list of road inventory and drainage inventory is given in *Annex-8 and Annex-9* respectively.





14.3.9: Action Plan for Ward 09

14.3.9.1 Criteria for the Plan Proposal

Demography

Ward no. 9 is located on the eastern part of the Pourashava. As per the pourashava population census data of 2011, the Ward No. 09 had a population of 10885 persons. Family size was 6; sex ratio was same with male and female. Population projection shows 11726 population for the year 2016. For the same year, it has a gross density of about 23 persons per acre and it will be 24 persons per acre in 2031. *Table 3.9.1* shows the detail.

Table 14.3.9A: Population Statistics of Ward No. 09

Item	Year				
	2011	2016	2021	2026	2031
Area (Acre)	482.33	482.33	482.33	482.33	482.33
Population	10,885	11,726	12,632	13,609	14,661
Population Density per acre	23	24	26	28	30

Source: Chandanaish Pourashava, 2011

14.3.9.2 Critical Issues and Opportunities of the ward

Critical Issues

Ward no. 9 is the eastern part of the Chandanaish Pourashava with characteristics of some urban and mostly predominant rural activities. It has the following critical issues,

- Lack of basic facilities and infrastructures required for an urban area.
- There is no systematic drainage and solid waste management facilities.
- Lack of adequate road.
- There is no water supply network at this ward.
- There is lack of commercial, open space, recreational, educational and social gathering facilities.

Development Opportunities

Due to low density of population and having external road linkage by Chittagong-Cox's Bazar highway i.e. Arakan Road creates development opportunity of this ward. The development opportunities are as follows,

- From environmental point of view, low density population can create a very livable environment for the area with respect to ventilation, use of road and other basic services.
- Some khals inside of Chandanaish Pourashava plays an important role in drainage system.
- Chittagong-Cox's Bazar highway i.e. Arakan Road also plays pivotal role to develop different facilities due to tourist attracting zone of Cox's Bazar, Teknaf and Saint Martin as well as Landport of Teknaf.

14.3.9.3 Proposals and Plan for Ward No. 09

14.3.9.3.1 Review of Existing Land Use

Ward No. 09 is mostly rural but only a few areas urban in character. Out of total 482.31 acres of land of this ward, around 213.19 acres of land i.e. 44.20% is reserved for agriculture. In existing land uses, both the urban residential and rural homestead has been considered as residential use as a whole. The residential use with 169.35 acres, occupies 35.11% of total land, water bodies 11.50%, circulation network 2.69% and education and research 2.39%. Only 0.05% of land is used as government service. There is only 0.85% land for urban green space and recreational facilities. No other notable type of land uses are found in this ward. *Table 3.9.2* shows the existing and proposed land use pattern of the ward (*Map 3.9A and Map 3.9B*).

14.3.9.3.2 Proposed Land Use Zoning

The category wise proposals are presented here. *Table 3.9.2* shows the amount of land existing and proposed uses in Ward no. 9.

i. Urban Residential Zone

At present around 169.35 acres land is occupied by urban residential use as a whole. In Ward Action Plan of Ward 09, around 67.10 acre of land has been earmarked for urban residential use which will occupy 13.90% of the total land in Ward 09.

ii. Rural Settlement

As this Ward is predominantly rural in character, a large portion of land like 184.47 acres (38.22%) of land is proposed for rural settlement up to the year 2031.

Table 14.3.9B: Summary of the Existing Land uses and Proposed Land uses

Sl. No.	Existing Landuse	Area in Acres	%	Sl. No.	Proposed General Landuse	Area in Acres	%
1	Residential	169.35	35.11	1	Urban Residential Area	67.10	13.90
				2	Rural Settlement	184.47	38.22
2	Education and Research	11.54	2.39	3	Education and Research	12.50	2.59
3	Governmental Services	0.24	0.05	4	Governmental Office	0.19	0.04
4	Non Government Services	-	-	5	Health Services	1.90	0.39
5	Commercial Activity	10.16	2.11	6	Commercial Zone	10.12	2.10
6	Manufacturing and Processing Activity	-	-	7	General Industry	-	-
7	Mixed Use	-	-	8	Mixed Use	-	-
8	Circulation Network	12.95	2.69	9	Circulation Network	50.84	10.53
9	Transport and Communication	-	-	10	Transport and Communication	6.44	1.33
10	Service Activity	0.46	0.10	11	Utility Services	1.49	0.31
11	Community Facilities	4.88	1.01	12	Community Facilities	7.46	1.55
12	Recreational Facilities	-	-	13	Recreational Facilities	1.85	0.38
13	Restricted Area	-	-	14	Restricted Area	-	-
14	Agriculture	213.19	44.20	15	Agriculture	77.49	16.05
15	Urban Green Space	4.09	0.85	16	Urban Green/ Open Space	24.90	5.16
16	Water Bodies	55.45	11.50	17	Water Bodies	35.91	7.44
17	Vacant Land	-	-	18	Historical & Heritage	-	-
18	Forest	-	-	19	Forest	-	-
19	Miscellaneous	-	-	20	Miscellaneous	-	-
				21	Urban Deferred	-	-
Total		482.31	100	Total		482.31	100

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

iii. Education and Research

In Ward Action Plan, one nursery school and one college is proposed which comprises an area of 2.29 acres.

iv. Government office

In ward no. 9, only 0.19 acres of land has been proposed for govt. services. *Table 3.9.2* has shown in detail and *ANNEX-7* shows the mouza wise plot proposal govt. offices of Ward no. 9.

v. Commercial Activity

At present, commercial activity and density of population are very low in this ward. Only 3.09 acres of land has been proposed as super market for this purpose.

vi. 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 50.84 acres of land and about 10.53% of the total area that is more workable for this ward.

vii. Community Facilities

Land for community facilities will be 7.46 acre (1.55%) whereas present land for this purpose in this ward is 4.88 acres. A community center of 0.46 acres has been proposed here beside proposed ward councilor's office.

viii. Agricultural Area

The total area under this use in Ward 09 has been estimated about 77.49 acres of land covering 16.05% of the total land of this ward.

ix. Open Space & Recreational Facilities

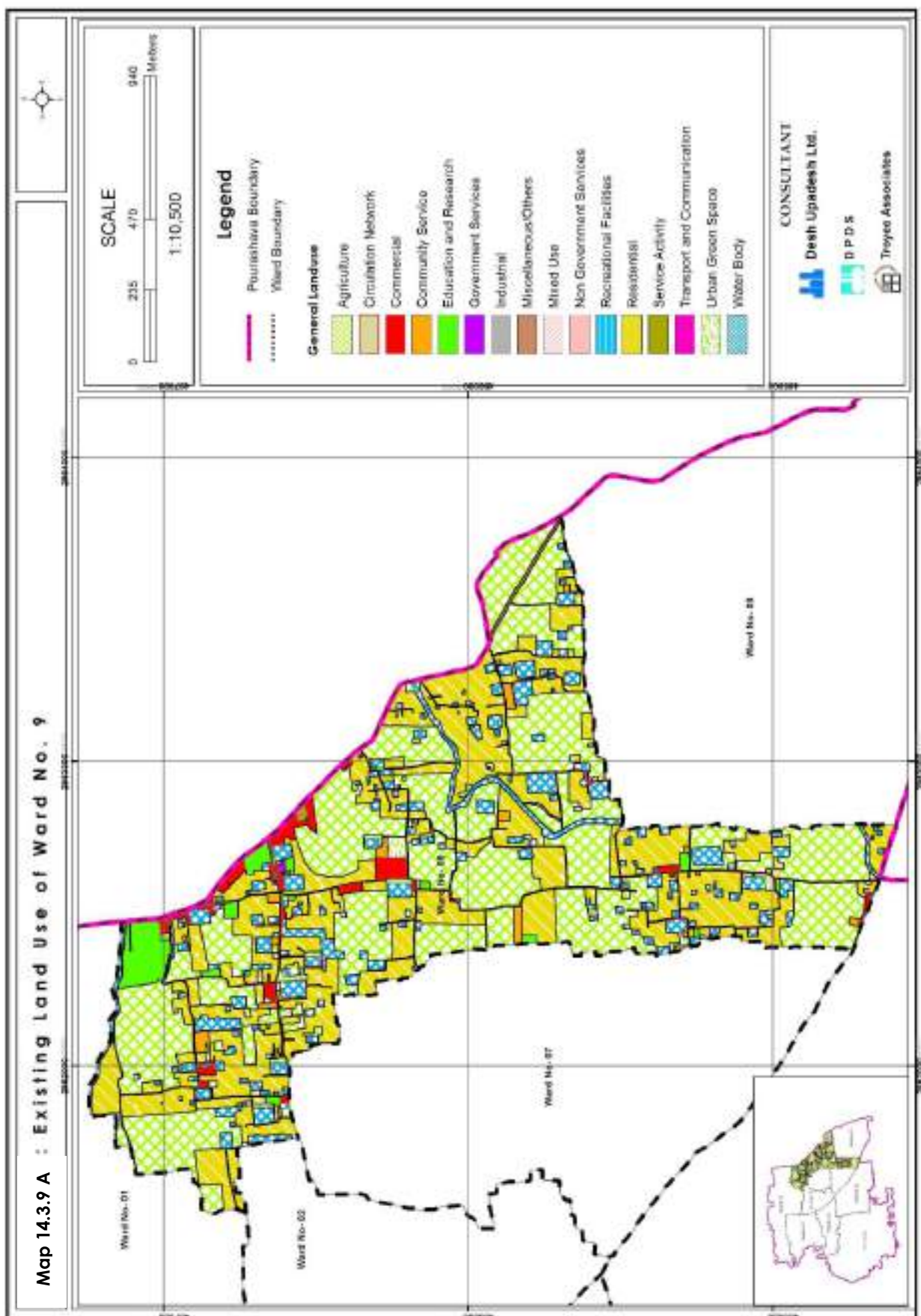
Land for open space will be 26.75 acres (5.54%) which includes open recreational facilities like playground and park.

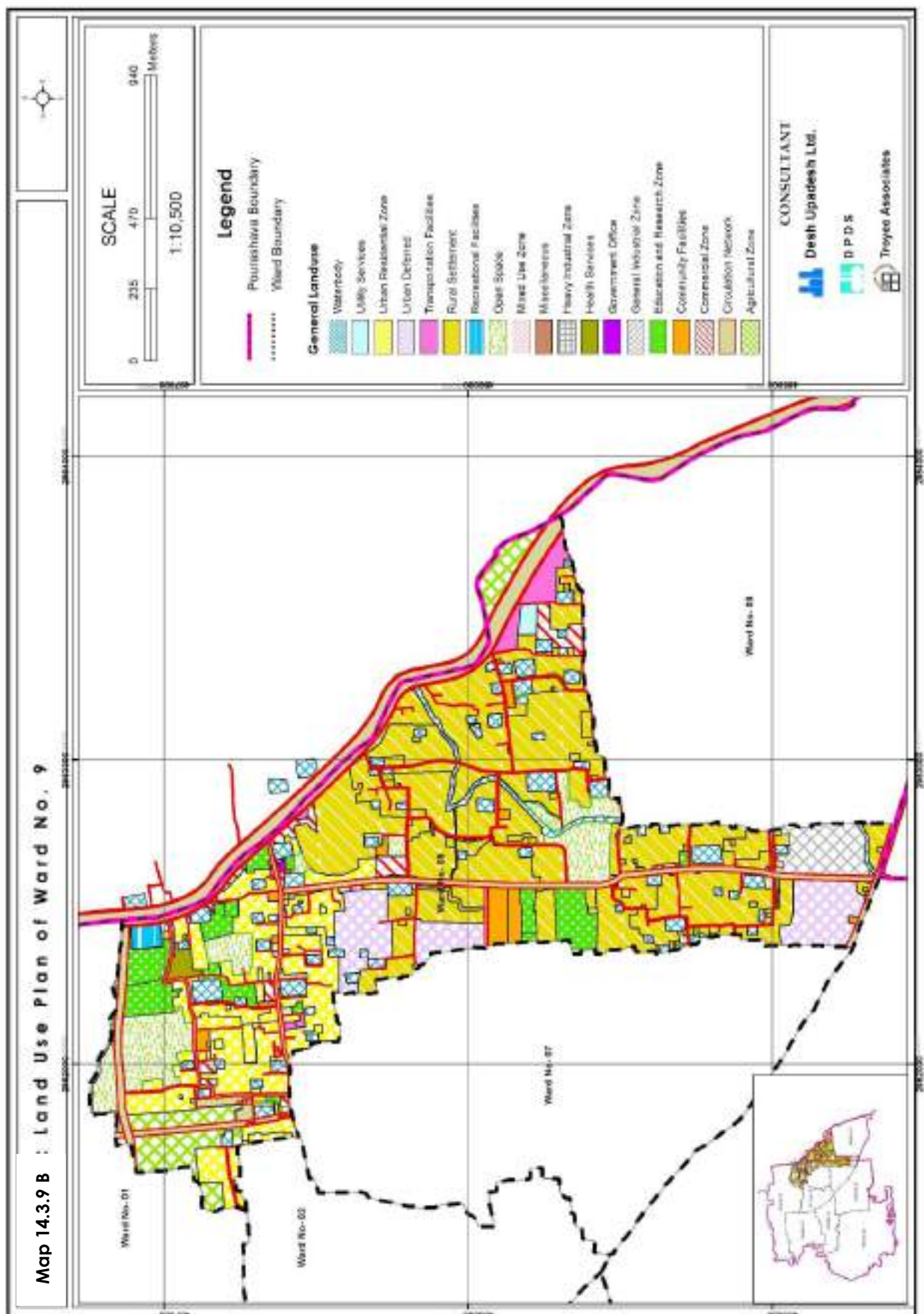
x. Water bodies

The proposed retention area (Water bodies) covers almost 35.91 acres of land which covers 7.44% of the total ward area. All of the existing water bodies like khal, river, pond, ditch etc have tried to preserve as possible.

xi. Utility Services Zone

A total of 1.49 acres of land covering 0.31% of total land is earmarked as Utility Services zone at Ward No. 09. A waste transfer station and a public toilet have proposed in this ward.





14.3.9.3.3 Proposed Road Infrastructure Development

A total of 18.73 km of road development has been proposed in first ward action plan for Ward No. 09 of Chandanaish Pourashava. Length of the access road (local road) will be 4.06 km and width of these roads will be 10 ft which covers 21.68% of total road network development proposal. Total length of tertiary (20 ft and 30 ft) and secondary road (40 ft and 60 ft) will be 9.20 km and 3.47 km respectively. The rest 1.99 km primary road will be developed and its width will be 80-160 ft at different locations. The detailed scenario of road network development proposal is given in *Table 3.9.3A and 3.9.3B (Map 3.9C)*.

Table 14.3.9C: Summary of Road Network Proposal at Ward No. 09

Road Width (in Feet)	\Type of Road	Total		New Road		Road Widening	
		Length (km)	%	Length (km)	%	Length (km)	%
10	Local Road (as it is)	4.06	21.68	-	-	-	-
20	Tertiary Road	7.91	42.24	0.18	30.51	7.73	54.92
30		1.29	6.89	-	-	1.29	9.16
40	Secondary Road	0.81	4.34	-	-	0.81	5.78
60		2.66	14.20	0.41	69.49	2.25	15.98
80	Primary Road	1.00	5.34	-	-	1.00	7.10
160		0.99	5.30	-	-	0.99	7.05
Total		18.73	100.00	0.59	100.00	14.08	100.00

Source: Prepared by Consultants

Table 14.3.9D: Phasing of Road Network Proposal at Ward No. 09

Road ID	Road Type	Proposal	Width (ft)	Phasing
TR-2	Tertiary Road	Widening Road	20	Second Phase
TR-20	Tertiary Road	Widening Road	20	Second Phase
TR-21	Tertiary Road	Widening Road	20	Third Phasing
TR-22	Tertiary Road	New Road	20	Third Phasing
TR-23	Tertiary Road	Widening Road	20	Third Phasing
TR-24	Tertiary Road	Widening Road	20	Second Phase
TR-467	Tertiary Road	Widening Road	20	Second Phase
TR-468	Tertiary Road	Widening Road	20	Second Phase
TR-476	Tertiary Road	Widening Road	20	Second Phase
TR-55	Tertiary Road	Widening Road	20	Third Phasing
TR-56	Tertiary Road	Widening Road	20	Third Phasing
TR-57	Tertiary Road	Widening Road	20	Second Phase
TR-58	Tertiary Road	Widening Road	20	Second Phase
TR-60	Tertiary Road	Widening Road	20	Second Phase
TR-71	Tertiary Road	Widening Road	20	Second Phase
TR-72	Tertiary Road	Widening Road	20	Second Phase
TR-78	Tertiary Road	Widening Road	20	Second Phase
TR-79	Tertiary Road	Widening Road	20	Third Phasing
TR-81	Tertiary Road	Widening Road	20	Second Phase
TR-93	Tertiary Road	Widening Road	30	Third Phasing
TR-94	Tertiary Road	Widening Road	30	Second Phase
TR-97	Tertiary Road	Widening Road	30	Third Phasing
SR-106	Secondary Road	Widening Road	40	First Phase
SR-108	Secondary Road	Widening Road	60	First Phase
SR-109	Secondary Road	New Road	60	First Phase
SR-110	Secondary Road	Widening Road	60	First Phase
SR-464	Secondary Road	New Road	60	First Phase
SR-485	Secondary Road	Widening Road	60	First Phase
SR-6	Secondary Road	Widening Road	60	First Phase
PR-114	Primary Road	Widening Road	80	First Phase
PR-483	Primary Road	Widening Road	80	Second Phase
PR-469	Primary Road	Widening Road	160	Second Phase

A total of 14.08 km of road widening has been proposed for this ward. Among these, 9.02 km, 3.06 km and 1.99 km is respectively for tertiary, secondary and primary road.

14.3.9.3.4 Proposed Drainage Infrastructure Development

Existing drainage is mostly depending on natural drainage facilities. The proposed drainage facilities will be developed based on these natural channels. The primary drain (5.92 km) for the ward which will be connected by 0.73 km secondary drain and 5.87 km tertiary drain. Table 3.9.4 shows the detail Drainage Network of Ward No. 09 in Chandanaish Pourashava (Map 3.9D).

Table 14.3.9E: Summary of Drainage Network Proposal at Ward No. 09

Drain Hierarchy	Drain Width (Meter)	Proposed Drain ID	Length (Km)
Primary Drain	1.50	PD-117	1.95
	1.50	PD-113	0.53
	1.50	PD-109	0.13
	1.50	PD-110	2.04
	1.50	PD-114	0.81
	1.50	PD-118	0.43
	1.50	PD-122	0.03
Sub-Total			5.92
Secondary Drain	1.00	SD-105	0.73
Sub-Total			0.73
Tertiary Drain	0.50	TD-21	0.19
	0.50	TD-22	0.32
	0.50	TD-23	0.14
	0.50	TD-46	0.37
	0.50	TD-47	0.29
	0.50	TD-48	0.94
	0.50	TD-61	0.39
	0.50	TD-67	0.30
	0.50	TD-68	0.28
	0.50	TD-70	0.65
	0.50	TD-75	0.25
	0.50	TD-127	0.17
	0.50	TD-20	0.26
	0.50	TD-19	0.33
	0.50	TD-24	0.14
	0.50	TD-45	0.24
	0.50	TD-49	0.01
	0.50	TD-51	0.23
	0.50	TD-59	0.14
	0.50	TD-60	0.03
	0.80	TD-125	0.01
	0.80	TD-93	0.19
Sub-Total			5.87
Grand Total			12.52

Source: Prepared by Consultants

14.3.9.3.5 Priority Tasks

The following priorities have been identified after the public consultation meeting at Chandanaish Pourashava. Among these tasks, activities under Priority-1 to be executed by first 5 years, actions under Priority-2 to be done by next 5 years and tasks under Priority-3 to be accomplished by last 10 years.

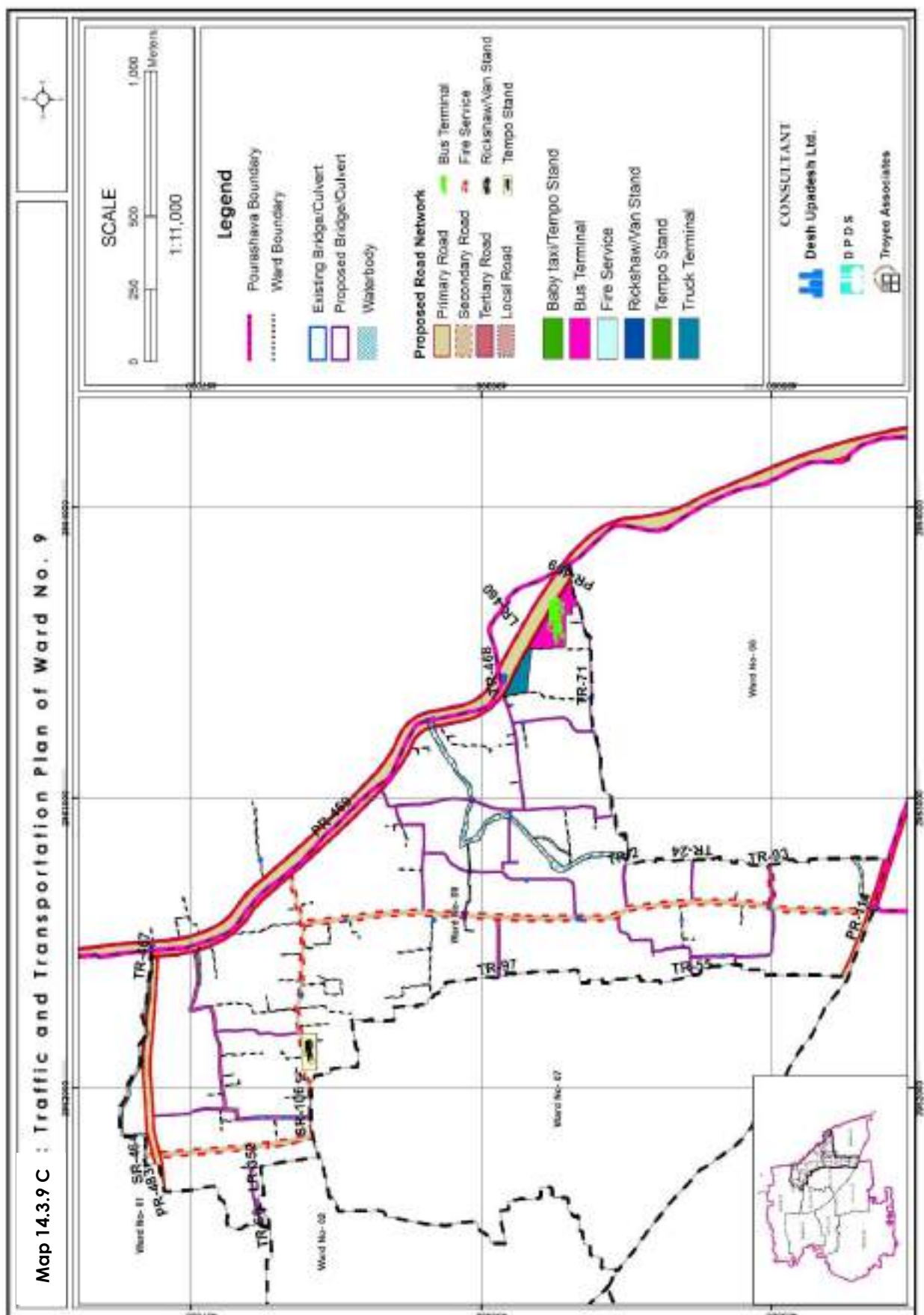
Table 14.3.9F: List of Priority Tasks has to be initiated by the Chandanaish Pourashava

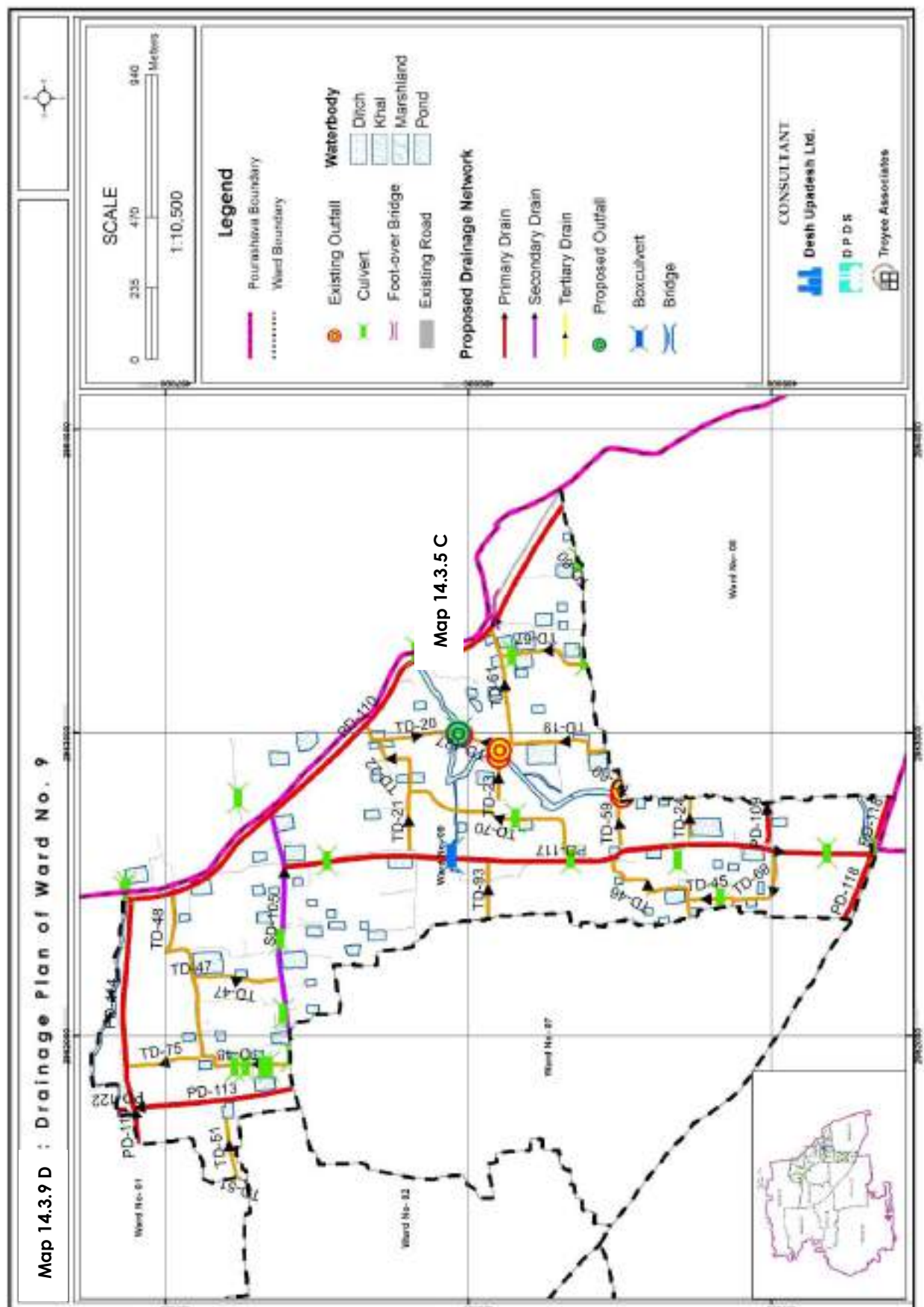
Priority-1		Priority-2		Priority-3	
Type of Construction	ID	Type of Construction	ID	Type of Construction	ID
Road Development	PR-114, SR-6, SR-108, SR-111, SR-112, SR-466	Road Development	PR-469, PR-483, TR-2, TR-20, TR-24, TR-57, TR-58, TR-60, TR-71, TR-72	Road Development	LR-352, LR-353, LR-354, LR-355, LR-356, LR-357, LR-358, LR-359, LR-360, LR-361, LR-362, LR-363

Priority-1		Priority-2		Priority-3	
Type of Construction	ID	Type of Construction	ID	Type of Construction	ID
	SR-111		TR-78, TR-81 TR-94, TR-467 TR-468, TR-476		LR-365, LR-366 LR-367, LR-368 LR-369, LR-370 LR-371, LR-372 LR-373, LR-374 LR-375, LR-376 LR-377, LR-378 LR-379, LR-381 LR-382, LR-383 LR-384, LR-385 LR-386, LR-387 LR-388, LR-389 LR-390, LR-391 LR-392, LR-393 LR-394, LR-395 LR-397, LR-419 LR-420, LR-423 LR-424, LR-425 LR-446, LR-462 LR-463, TR-21 TR-22, TR-23 TR-55, TR-56 TR-79, TR-93 TR-97
Drain	PD-117, PD-113 PD-109, PD-110 PD-114, PD-118 PD-122	Drain	SD-105	Drain	TD-21, TD-22 TD-23, TD-46 TD-47, TD-48 TD-61, TD-67 TD-68, TD-70 TD-75, TD-125 TD-127, TD-20 TD-19, TD-24 TD-45, TD-49 TD-51, TD-59 TD-60, TD-93
Other Facilities	Bus Terminal, Waste Transfer Station, College, Community Clinic, Eidgah Primary School, Small Scale Industry	Other Facilities	Truck Terminal, Nursery School, Primary School, Public Toilet, Super Market, Tempo Stand	Other Facilities	Park, College, Madrasa

Source: Prepared by consultants

Plot wise specific development proposal is attached in *Annex-7*, list of road inventory and drainage inventory is given in *Annex-8* and *Annex-9* respectively.





Chapter 4: Implementation Guidelines

Implementation of the Ward Action Plan as well as Urban Area Plan of Chandanaish Pourashava should follow properly with legal enforcement and should also follow the development control procedures for determining planning applications by use of the simple and standard planning application procedures. As there is no specific laws, Act or Rules for Pourashava Master Plan but several Act/ Act and Rules e.g. Pourashava Act 2009, Building Construction Act 1952, Wetland Conservation Act 2000, Land Development Rules 2004 and BNBC 1993 related with the implementation of Urban Area Plan. Other national policies, guidelines and programs relevant to agriculture, forest, population, environment and tourism etc. have also implications for the implementation of the various components of Urban Area Plan and Ward Action Plan. Appropriate professional should be recruited, responsible and accountable to exercise the approval, monitoring, control and implementation of development works. Detail discussion has been set forth in the section-00, which reveals the urgency for creation of some division/ department including planning and development control with the existing pourashava organogram.

Chapter 5: Concluding Remarks

5.1 Introduction

The pourashavas in Bangladesh do not have any practicing plans at present in regard to organized development of land use or infrastructures. This situation has been continuing over a long period of time in the past promoting spontaneous land and infrastructure development. The present endeavor of preparing Pourashava Master Plan of 223 Upazila Town is the first time in history of Bangladesh for delivering detail plan proposal following scientific planning approach using modern surveying and mapping tools and techniques. To control the unplanned development in most of the urban centers of Bangladesh, this three tier development plan will be an effective tools for promoting planned and environment friendly development. Urban Area Plan and Ward Action Plan is prepared for managing and promoting development over medium terms following the broad guidelines set by the longer term Structure Plan. It shows the structure of sub-system in space over the medium term and identifies broad programs of direct action especially related to infrastructural development, institutional issues as well as broad financing strategies. The plan also outlines more specific Ward-wise development policies to guide development over the medium terms. One major objective of preparing Master Plan is the consolidation of development activities by various agencies in areas that have strongest potential for growth in the medium term and can accommodate anticipated volume of growth. Ward Action Plan provides details of landuse zoning and building controls, the development control function becomes easier to implement with the Pourashava Master Plan. It also shows land reservations required for essential uses and major infrastructure development.

5.2 Comparative Advantage of Master Plan

The term Master Plan deserves wider sense than the term Urban Area Plan and Ward Action Plan. Policies and strategies are being prescribed in the Master Plan based on the existing trend of development and growth potentiality. The Ward Action Plan only emphasizes on those components immediate action is being necessary. The Master Plan is for the concerned Pourashava as a whole but the Ward Action Plan is only for individual Ward of that Pourashava. All studies relevant and guided by the ToR is being followed for the preparation of Master Plan at first and based on those studies and findings the Ward Action Plan is being designed. The Ward Action Plan is relevant with the implementation criteria termed as the implementation of Master Plan. The micro-component which is going to be implemented according to the Ward Action Plan is guided by the Master Plan. Therefore, any problem arises during the implementation phase of Ward Action Plan will be resolved through the guideline prescribed in the Master Plan.

5.3 Conclusion

In order to make the plans sustainable through people's participation, it is now emphasized involvement of the local stakeholders in the planning development process. It is not possible for the government alone to go for plot to plot development as per plan with its meager resources. This calls for involving stakeholders, particularly, the land owners in the development process. Such initiative is possible at the local level infrastructure development, where the land owners will be directly benefited. Such participation creates a sense of ownership of the plan among the stakeholders that brings support for the plan and helps to create favorable conditions to implement the plan provisions.

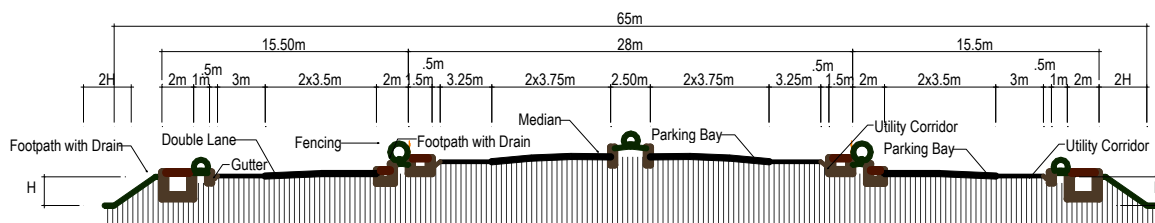
Keeping this approach in mind the present Structure Plan, Urban Area Plan and Ward Action Plans for Chandanaish Paurashava has been prepared. Regular monitoring of the plan implementation is necessary together with monitoring of urban development trend in new areas. It is expected that the proper implementation of this plan with close monitoring will make this prosperous city livable, healthy and will bring overall socioeconomic development in future.

The plan and proposals for the period of 20 years should also require periodic review and update accordingly considering the change circumstances by appointing relevant and appropriate experts as the planning is continuous, not rigid and never ending process. Pourashava and concerned authority should take necessary measures to update plan at regular interval, which will make this plan document effective, dynamic and beneficiary for the Pourashava dwellers.

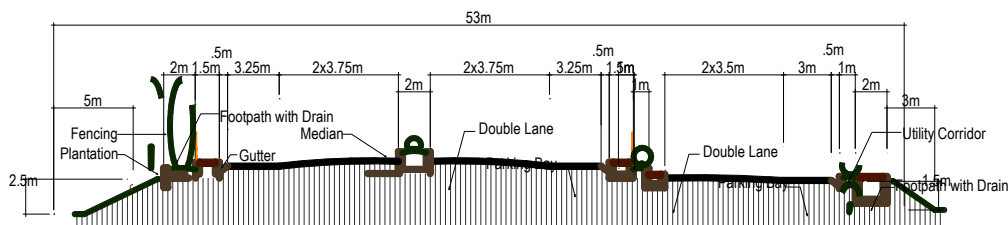


ANNEXTURES

A: Cross Section of Primary, Secondary and Tertiary Roads

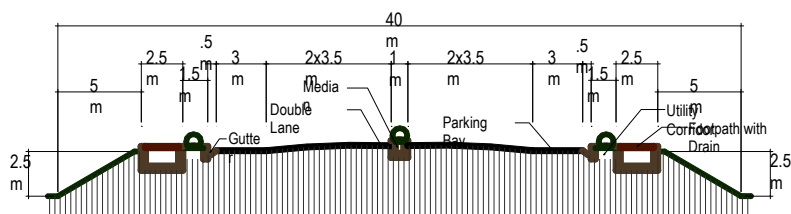


Cross Section of Highway with Two Side Primary Roads

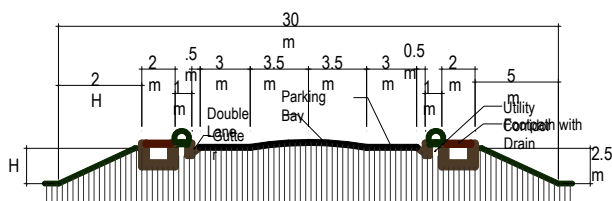


Cross Section of Highway with One Side Primary Road on Embankment

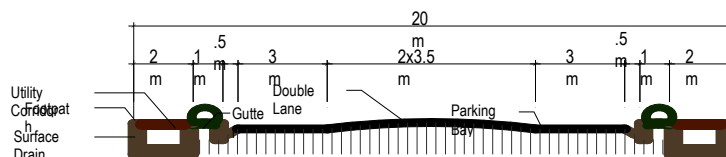
Figure 1: Highway-Local Primary Road Combination



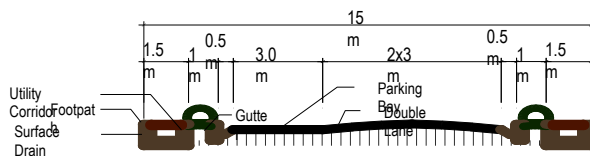
Cross Section of Two Side Primary Road



Cross Section of One Side Secondary Road



Cross Section of Urban Secondary Road



Cross Section of Pourashava Distributor

Figure 2: Standard Sections of Secondary Roads

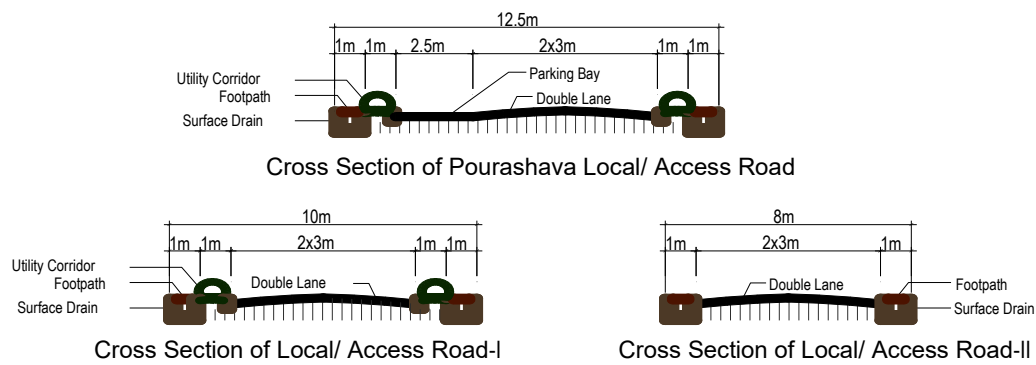
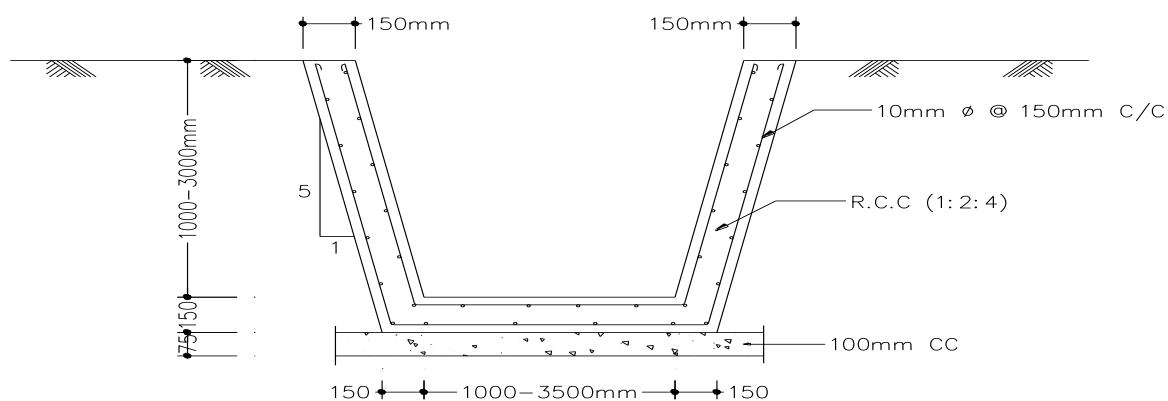
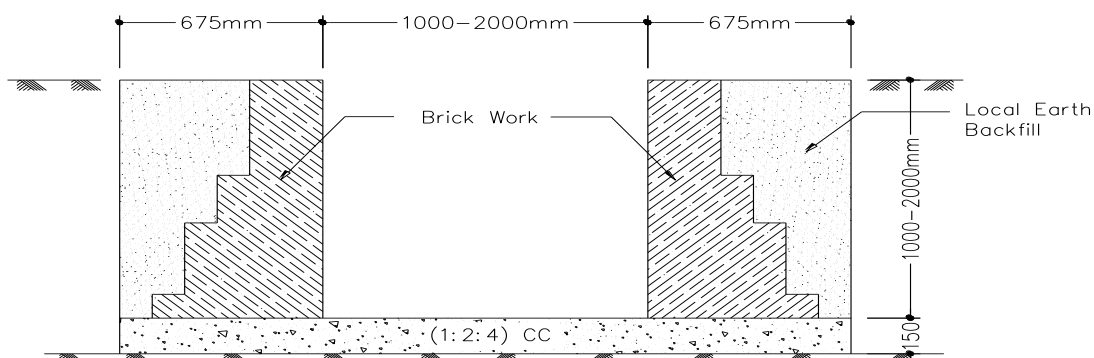


Figure 3 Standard Sections of Pourashava Local Roads

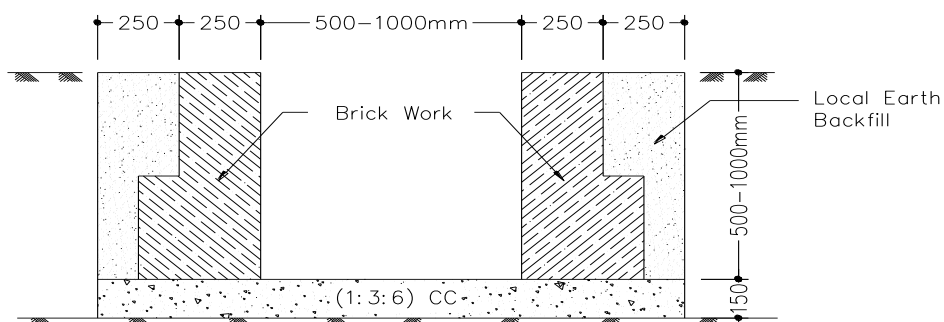
B: Cross Section of Primary Secondary and Tertiary Drains



Typical R.C.C Primary Drain



Typical Secondary Drain (Dimensions in mm)



Typical Tertiary Drain (Dimensions in mm)

Annexure-2: Letter to Paurashava for Development Proposal & Arranging Final Consultation Meeting

**Consultancy Services for Preparation of Master Plan for Pourashavas under
Upazila Towns Infrastructure Development Project (UTIDP)
Local Government Engineering Department (LGED)**

Consultants: Dosh Upadesh Ltd., Development Project Design Services & TROYEE associates

স্মারক নং: এলজিইডি/মাটার প্লান/২৪০৭১১/৮৩

তারিখ: ২৪ জুলাই ২০১১ ইং

করকর
মাননীয় মেয়র,
চন্দনাইশ পৌরসভা,
চট্টগ্রাম।

বিষয়: আপনার পৌরসভার গৃহীত উন্নয়ন পরিকল্পনা সমূহ ২০ বছর মেয়াদি উন্নয়ন মধ্য পরিকল্পনায় আওতাভুক্ত করবার প্রসঙ্গে।

জনাব,

আপনি নিশ্চয়ই অবগত আছেন যে, DUL-DPDS-TROYEE কনসালটিং ফার্ম আপনার পৌরসভার ২০ বছর মেয়াদি উন্নয়ন মধ্য-পরিকল্পনা প্রনয়ন এর কাজে নিয়োজিত আছে। বাংলাদেশের সহযোগিতার ফলে আমরা মটির প্লান প্রনয়ন এর কাজ প্রায় শেষ পর্যায়ে নিয়ে এসেছি। আপনার পৌরসভায় বিভিন্ন প্রতিষ্ঠানের দ্বারা গৃহীত উন্নয়ন পরিকল্পনা সমূহ প্রণীত মাটার প্লান-এ অন্তর্ভুক্ত করা প্রয়োজন। এমতাবস্থায় উক্ত উন্নয়ন পরিকল্পনা সমূহের তথ্যসমূহ বিভিন্ন সরকারী/বেসরকারী সংস্থা বা অধিদপ্তরের সাথে আলোচনা সাপেক্ষে আমাদের সারবরাহ করে আপনার পৌরসভার মাটার প্লান প্রনয়ন এর কাজ ত্বরান্বিত করবার জন্য বিশেষ ভাবে অনুরোধ করা হইল।

উপরোক্ত বিবরণের প্রতি গুরুত্বারোপ করে আপনাকে কার্যকরী ব্যবস্থা গ্রহণের জন্য অনুরোধ করা হইল। আপনার আন্তরিক সহযোগিতার মাধ্যমেই কেবল একটি বাস্তবসম্মত মাটার প্লান প্রনয়ন সম্ভব।



পরিকল্পনাবিদ ফজলে রেজা সুমন
চেপুটি টিম লিডার,
উপজেলা শহর অবকাঠামো উন্নয়ন প্রকল্প,
প্যাকেজ -০৫।

তদুপরি (সদয় অবগতির জন্য)

০১। প্রকল্প পরিচালক, উপজেলা শহর অবকাঠামো উন্নয়ন প্রকল্প, এলজিইডি, ঢাকা।

Letter from Pourashava regarding confirmation of Population



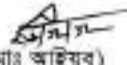
চন্দনাইশ পৌরসভা কার্যালয়
জেলা - চট্টগ্রাম

স্মারক নং - চন্দ/পৌর/১৩৮

তারিখ : ২৬/১২/২০১২খ্রিঃ

বিষয়ঃ পৌর এলাকার জনসংখ্যা ও ভোটার তথ্য প্রেরণ সংক্রান্ত।

উপর্যুক্ত বিষয়ের আলোকে জানানো যাচ্ছে যে, অত্র পৌরসভার ১৭.০৮ বর্গকিলোমিটার এলাকার মধ্যে মোট জনসংখ্যা ৭৫,৩৫৯জন এবং মোট ভোটার সংখ্যা ৩১,৩৫৯ জন।


(মোঃ অহিযুব)
মেয়র
চন্দনাইশ পৌরসভা
জেলা- চট্টগ্রাম

রোয়ী এসোসিয়েট - ১২০১
লেভেল-১২, জেডেনে হোডিং ৫২/১,
নিউ ইন্সটান রোড, ঢাকা - ১০০০।

Annexure 3: Photographs of Final Consultation Meeting



Photograph: Deputy Team Leader and Urban Planner of Package-05, illustrates the importance of Pourashava Master Plan and Development Proposal for Chandanaish Pourashava



Photograph: Councilors and Engineers of Chandanaish Pourashava delivering some suggestion for the development



Photograph: Participation of Stakeholders of Chandanaish Pourashava on different aspects of development proposal in the proposed Draft Master Plan



Photograph: Providing explanation on Plan, proposition by Urban Planner of age-05



Photograph: Mayor of Chandanaish Pourashava delivering her comments physically in the field regarding proposition of infrastructural development and service facilities in the Draft Master Plan

Annexure-4: Meeting Minutes of Final Consultation Meeting



চন্দনাইশ পৌরসভা কার্যালয়
চন্দনাইশ, চট্টগ্রাম ।

ବିଶ୍ୱାସୀ ଶ୍ରମିକଙ୍କୁ ଆକର୍ଷଣ କରିବା ପାଇଁ ଶ୍ରମିକମାନଙ୍କୁ ଶ୍ରମ ସୁରକ୍ଷା ଆଇନର ଅନୁଯାୟୀ
ନିୟମିତ ଭାବରେ ଶ୍ରମ ସୁରକ୍ଷା ଆଇନର ଅନୁଯାୟୀ ନିୟମିତ ଭାବରେ

স্বাক্ষর: : ডাঃ. আব্দুল হাদি, ডক্টারিং প্রোগ্রাম
তারিখ: : ১৯ জানুয়ারী ২০১৬ খ্রিঃ.
স্থান: : কলকাতা বিশ্ববিদ্যালয়, কলকাতা
পত্র: : পত্র নং ১৫৩৮, মণিকোণ

ଅଧିକାଂଶ ଶିକ୍ଷକଙ୍କ ମତରେ ଏହା ଉପଯୋଗୀ

[illegible]

ଅଧିକାରୀଙ୍କୁ ସମ୍ବୋଧନ.

[illegible][illegible][illegible]

Annexure-5: Attendance Sheet of Final Consultation Meeting

Preparation of Master Plan for Pourashava

Upazilla Towns Infrastructure Development Project (UTIDP)

Local Government Engineering Department (LGED)

Attendance Sheet

Name of the Pourashava		Date	Time	Venue
চন্দনাইশ		২২/০৮/২০২০	১১:৩০	(পৌরসভা অফিসে)
SL No.	Name	Designation	Signature	Contact No.
২৭	জন: ১৭৭৭	১৭৭৭	১৭৭৭	০১৮১৮৭৭৭৭৭৭
২৮	সাবিত্রী কান্ত	কিউএ	সাবিত্রী	—
২৯	জন: ১৭৭৭	১৭৭৭	১৭৭৭	০১৮২২২২২২২২
৩০	জন: ১৭৭৭	১৭৭৭	১৭৭৭	০১৮২২২২২২২২
৩১	জন: ১৭৭৭	১৭৭৭	১৭৭৭	০১৮২২২২২২২২
৩২	জন: ১৭৭৭	১৭৭৭	১৭৭৭	০১৮২২২২২২২২
৩৩	Faybol Nabi Chy	ফেইবল নাবি চ্য	ফেইবল নাবি চ্য	—
৩৪	জন: ১৭৭৭	১৭৭৭	১৭৭৭	—
৩৫	জন: ১৭৭৭	১৭৭৭	১৭৭৭	০১৮১৯৫৪৮৫৮/
৩৬	জন: ১৭৭৭	১৭৭৭	১৭৭৭	০১৮৬৭৫০৬৭৬
৩৭	জন: ১৭৭৭	১৭৭৭	১৭৭৭	০১৮২৭৭৭৭৭৭
৩৮	জন: ১৭৭৭	১৭৭৭	১৭৭৭	০১৮৩০৫৭১০৫৫
৩৯	জন: ১৭৭৭	১৭৭৭	১৭৭৭	০১৮৩০৫০৫০৫০
৪০	জন: ১৭৭৭	১৭৭৭	১৭৭৭	০১৮৩৫৮৫৫৫১৭
৪১	জন: ১৭৭৭	১৭৭৭	১৭৭৭	০১৮১৭৭৭৭৭৭
৪২	জন: ১৭৭৭	১৭৭৭	১৭৭৭	০১৮১৭৭৭৭৭৭
৪৩	জন: ১৭৭৭	১৭৭৭	১৭৭৭	০১৮১৭৭৭৭৭৭
৪৪	জন: ১৭৭৭	১৭৭৭	১৭৭৭	০১৮২০২৭৭৭৭
৪৫	জন: ১৭৭৭	১৭৭৭	১৭৭৭	০১৮২০২৭৭৭৭
৪৬	জন: ১৭৭৭	১৭৭৭	১৭৭৭	০১৮২০২৭৭৭৭
৪৭	জন: ১৭৭৭	১৭৭৭	১৭৭৭	০১৮২০২৭৭৭৭
৪৮	জন: ১৭৭৭	১৭৭৭	১৭৭৭	০১৮২০২৭৭৭৭
৪৯	জন: ১৭৭৭	১৭৭৭	১৭৭৭	০১৮২০২৭৭৭৭

Annexure 6 : 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)

Permitted Urban Residential Uses
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
Flood Management Structure

Conditionally Permitted Urban Residential Uses
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

Permitted General Industrial Activities
Sawmill, Chipping and Pallet Mill
Shelter (Passers By)
Television, Radio or Electronics Repair (No Outside Storage)
Transmission Lines
Truck Stop & Washing or Freight Terminal
Utility Lines
Wood Products
Woodlot
ATM Booth
Water Pump \ Reservoir
Effluent Treatment Plant
Social Forestry

Source: Compiled by the Consultants

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

Conditionally Permitted General Industrial Land Uses
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

Permitted Commercial Activity
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 Farming
General Store
Grocery Store
Handloom (Cottage Industry)
Housing For Seasonal Firm Labor
Middle Income Housing
Mosque, Place Of Worship
Newspaper Stand
Nursery School
orphanage
Outdoor Religious Events (Eidgah)
Playing Field
Park
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

Permitted uses in Mixed Use Zone
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

Permitted uses in Mixed Use Zone
Software Development
Special Dwelling
Toys and Hobby Goods Processing and Supplies
Training Centre
Transmission Lines
Utility Lines
Vehicle Sales & Service, Leasing or Rental
Warehousing
Woodlot
Children's Park
ATM Booth
Water Pump \ Reservoir
Social Forestry
Dormitory
Rickshaw \ Auto Rickshaw Stand

Source: Compiled by the Consultants

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

Conditionally permitted uses in Mixed Use Zone
Department Stores, Furniture & Variety Stores
Drug Store or Pharmacy
Energy Installation
Fitness Centre
Flowers, Nursery Stock and Florist Supplies
Freight Handling, Storage & Distribution
Freight Transport Facility
Gaming Clubs
Garages
Garden Center or Retail Nursery
Commercial Office
Project Office
Government Office
Hotel or Motel
Household Appliance and Furniture Repair Service
Indoor Amusement Centers, Game Arcades
Indoor Theatre
Lithographic or Print Shop
Market (Bazar)
Health Office, Dental Laboratory, Clinic or Lab
Musical Instrument Sales or Repair
Optical Goods Sales
Outdoor Café
Outdoor Fruit and Vegetable Markets
Painting and Wallpaper Sales
Paints and Varnishes
Patio Homes
Photofinishing Laboratory & Studio
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
Social Forestry
Dormitory

Permitted uses under Education & Research Zone

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

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 Farming
Deep Tube Well

Permitted uses under Agricultural Zone
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

Permitted uses under Open Space
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.

Annexure-7: Mouza Schedule

Ward Number	Type of Facilities	Land use Categories	Mouza Name	Plot Number
Ward No. 01	Community Centre	Community Facilities	Gacbaria	321, 320, 316, 318, 317, 314, 315, 329, 310
	Community Clinic	Health Services	Gacbaria	324, 322, 319, 321, 320
	High School	Education and Research Zone	Uttar Joara	8053, 8054, 8063, 8062, 8064, 251, 252, 8947, 253
	Library	Education and Research Zone	Gacbaria	313, 314, 315, 312, 310, 311, 307, 308, 309, 306
	Madrasha	Education and Research Zone	Uttar Joara	1, 93, 96-97, 184, 189, 192, 195, 198-200, 202, 1284, 9258, 9259, 9271, 9274-9276, 9601, 9603, 9605-9619, 9622-9630, 9372, 9373
	Neighbourhood Market	Commercial Zone	Uttar Joara	9087, 9088, 9082, 9083, 9084, 9086, 9089
	Play Ground	Open Space	Uttar Joara	9249, 8962, 8968, 9229, 9250, 9228, 8970, 8983, 8969, 8971, 9227, 8972, 9226, 9225, 8982, 8981, 8974, 8973, 9224, 8980, 8979, 8993, 8989, 8988, 8975, 8990, 8976, 8978, 9218, 8992, 8991, 9222, 9217, 8977, 9215, 9016, 9017, 9018, 9214, 460, 461, 457, 463, 462, 466, 467, 464
	Primary School	Education and Research Zone	Uttar Joara	9016, 9017, 9018, 9214, 9213, 9019, 9211, 9212, 9210, 9209, 9208, 9022, 9021, 9020
	Solid Waste Disposal Site	Utility Services	Uttar Joara	618, 619, 561, 620, 582, 567, 581, 580, 579, 578, 566, 583, 568, 559, 560, 555, 576, 573, 586, 585, 575, 574, 572, 571, 570, 569, 558, 587, 557, 556, 502, 504, 510, 517, 500, 501, 503, 505, 509, 511, 516, 518, 519, 584, 496, 506, 588, 520, 494, 495, 499, 498, 512, 507, 514, 515, 589, 508, 484, 513, 493, 492, 485, 483, 482, 481, 270, 480
	Tempo Stand	Transportation Facilities	Uttar Joara	8993, 8956, 8998, 8997, 8999, 8992, 9000, 8996, 8995, 8994, 9016, 9001, 9002, 9003, 9014, 9005, 9004, 9013, 9015, 9019, 9011, 9012, 9022, 9073, 9077, 9078, 9087
			Gacbaria	451, 438, 439, 449, 450, 442, 441, 440, 448, 434, 508, 325, 324, 322, 326, 323, 327, 321, 328, 320, 329, 508
Ward No. 02	Central Eidgah	Community Facilities	Chandanish	88, 489, 75, 87, 486, 474, 479, 478, 480, 84, 76, 477, 481, 1284
	College	Education and Research Zone	Chandanish	56, 57, 1056, 67, 54, 64, 3, 52, 59, 1083, 51, 50, 57, 1084, 28, 29, 1082, 9, 7, 30, 5, 1131, 46, 86, 8, 33, 88, 24, 27, 32, 34, 9, 47, 7, 2, 1143, 90, 6, 5, 1135, 18, 6, 2, 1, 93, 1220, 8, 44, 38, 7, 42, 21, 23, 1, 1, 94, 1117, 10, 9, 40, 9, 20, 1116, 1095, 11, 22, 1223, 2, 4, 26, 5, 27, 1106, 4, 9, 1109, 1115, 8, 29, 1100, 3
	Corner Shop	Commercial Zone	Chandanish	75, 93, 6, 4, 1, 68, 43, 9, 67, 18, 296, 295, 1, 60, 2, 17, 49, 9, 63, 3, 1, 2, 7, 209, 54, 5, 256, 301, 207, 6, 10, 2, 205, 204, 1284, 202, 202, 1, 1284, 93, 198, 198, 200, 1, 96, 96, 192, 97, 199, 189, 195, 195, 184
	Nursery School	Education and Research Zone	Chandanish	73, 74, 75, 1376, 1386, 7, 1387, 83, 1382, 1388, 1385, 3093, 81, 78, 1389, 9, 1384, 1393, 1380, 1390, 52, 54, 53, 1392, 31, 2
	Park	Open Space	Chandanish	11, 12, 9, 9, 8, 8, 1, 1, 6, 5, 4
	Play Ground	Open Space	Chandanish	228, 2, 37, 279, 41, 7, 42, 40, 27, 6, 220, 43, 223, 2

Ward Number	Type of Facilities	Land use Categories	Mouza Name	Plot Number
	Rickshaw/ Van Stand	Transportation Facilities	Chandanish	2, 91, 94, 1284
	Tempo Stand	Transportation Facilities	Chandanish	40, 38, 1284
	Waste Transfer Station	Utility Services	Chandanish	1188, 1189, 76, 1190, 58, 57, 1284, 16, 15
	Wholesale Market	Commercial Zone	Chandanish	6, 1278, 76, 77, 1304, 2, 1275, 1296, 85, 87, 1295, 1274, 1, 1269, 67, 1289, 1266, 1284
Ward No. 03	Fire Service	Utility Services	Uttar Joara	2324, 2302, 2303, 2304, 2323, 2325, 2306, 2305, 2321, 2322, 2307, 2330, 2308, 2331, 2332, 2310, 2311, 2319, 2333, 2318, 2313, 2312, 2334, 2338, 2314, 2315, 2298, 2295, 2335, 2316, 2317
	High School	Education and Research Zone	Uttar Joara	8584, 8647, 8655, 8648, 8653, 8654, 8656, 8666
	Park	Open Space	Uttar Joara	8511, 8510, 8509, 8505, 8507, 8508, 8506, 8504, 8502, 8503, 8681
	Play Ground	Open Space	Uttar Joara	8585, 8586, 8595, 8587, 8588, 8594, 8584, 8589, 8590, 8591, 8592, 8602, 8653, 8654, 8604, 8603, 8601, 8605, 8666, 8665
	Waste Transfer Station	Utility Services	Uttar Joara	2551, 2552, 2554, 2553, 2555
Ward No. 04	Central Park	Open Space	Horla	6192, 93, 6181, 94, 6194, 8, 9, 6196, 120, 80, 6207, 11, 6229, 6, 7, 12, 28, 6230, 6171, 13, 98, 97, 22, 24, 6206, 14, 21, 23, 6199, 6169, 67, 6231, 15, 33, 6200, 5, 6168, 4, 29, 16, 6203, 30, 6201, 17, 34, 6128, 36, 6202, 6218, 3, 19, 6127, 6096, 95, 26, 20, 37, 98, 99, 123, 6, 1, 94, 6135, 6124, 6157, 93, 6122, 6120, 3, 52, 51, 4, 6083, 39, 6138, 98, 6104, 17, 18, 2, 9, 3, 6103, 4, 6142, 41, 40, 92, 85, 84, 6150, 6109, 91, 6116, 6105, 6086, 13, 49, 48, 14, 15, 6143, 6087, 5807, 5805, 5921
	College	Education and Research Zone	Horla	2322, 2307, 2330, 2308, 2331, 2332, 2310, 2311, 2319, 2333, 2318, 2313, 21, 23, 6199, 6169, 67, 6231, 15, 33, 6200, 5, 6168, 4, 29, 16, 6203, 30, 6201, 17, 34, 6128, 36, 6202, 6218, 3, 19, 6127, 6096, 95, 26, 20, 37, 6134, 6125, 97, 6082, 98
	Community Centre	Community Facilities	Horla	24, 27, 32, 34, 9, 47, 7, 2, 1143, 90, 6, 5, 1135, 18, 6, 2, 1, 93, 1220, 8, 44, 38, 7, 42, 21, 23, 1, 1, 94, 1117, 10, 9, 40, 9, 20, 1116, 1095, 11, 22, 1223, 2, 4, 26, 5, 27, 1106, 4, 9, 1109, 1115, 8
	Community Clinic	Health Services	Horla	583, 568, 559, 560, 555, 576, 573, 586, 585, 575, 574, 572, 571, 570, 569, 558, 587, 557, 556, 502, 504, 510, 517, 500, 501, 503, 505, 509, 511, 516, 518, 519, 584, 496, 506, 588, 520, 494, 495, 499, 498, 512, 507, 514, 515
	High School	Education and Research Zone	Horla	9617, 9623, 9622, 9625, 9624, 9608, 9626, 9609, 9627
	Library	Education and Research Zone	Horla	1220, 8, 44, 38, 7, 42, 21, 23, 1, 1, 94, 1117, 10
	Neighborhood Market	Commercial Zone	Horla	45,46,53,199,200,201,209,219,320,324,325,326,454,455,461,462,463,464,465,466,467,468,484,486,487,861,862,863,866,873,874,875,886,892,918,921,942,948,99999,1199,1481,1729,1733,1734,1739,2049,99999,2551,2656,2658,2667,2668,2681,2721,2722,99999,3393,34

Ward Number	Type of Facilities	Land use Categories	Mouza Name	Plot Number
				48,3624,3625,3631,3703,3777,99999,4541,4549,4550,4558,4685,4689,4690,4691,5006
	Play Ground	Open Space	Horla	454,455,461,462,463,464,465,466,467,46848,4,486,487,861,862,863,866,873,874,875,886,892,918,921,942,948,99999,1199,1481,1729,1733,1734,1739,2049,99999,2551,2656,2658,2667,2668,2681,2721,2722,99999,3393,3448,3624,3625
	Tempo Stand	Transportation Facilities	Horla	2321, 2322, 2307, 2330, 2308, 2331, 2332, 2310, 2311, 2319, 2333, 2318, 2313, 2312, 2334, 2338, 2314, 2315
	Ward Office	Governmental Services	Horla	1388, 1385, 3093, 81, 78, 1389, 9, 1384, 1393, 1380, 1390, 52, 54, 53, 1392
Ward No. 05	Community Centre	Community Facilities	Horla	1035,1318,1334,1336,1339,1341,1342,1344,1347,1348,1349,1350,1351,1352,1353
	Corner Shop	Commercial Zone	Horla	54,55
	Madrasha	Education and Research Zone	Horla	1185,1198,1199,1200,1202,1203,1208, 1210, 1211,1297,1298,1318,1319,
	Park	Open Space	Horla	133,134,139,140,141,165,191,192,193, 194,199,200,201,209,219,242,243
	Play Ground	Open Space	Horla	1095,1112,1113,1114,1197,1198,1199, 1200
	Primary School	Education and Research Zone	Horla	51,54,56,66,200,491,492,886,940,942,943,948,99999,1739,1769,1772,1773,1775,1776,1781,1788,1799,1800,1896,99999,2657,2658,3631
	Ward Office	Governmental Services	Horla	49,1103,1481,99999,99999
Ward No. 06	Agri Extention Farm	Governmental Services	Horla	691,694,695,696,792,806,924,965,1095,1097, 1106,1159,1172,1236,1247
	Agri Extention Farm	Governmental Services	Dakkhin Joara	112,113,116,117,130,131,242,251,253,254,99999,1343,1452,1453,1574,1575,1728,1729,1739,740,1779,1808,99999,3402,3403
	Baby taxi/Tempo Stand	Transportation Facilities	Horla	538,574,575,577,578,579,581,582,583,586,886,1592,1593,1595,1596,1599,1604,1605,1606,1607,1624,1629,1641,1654,
	Baby taxi/Tempo Stand	Transportation Facilities	Dakkhin Joara	965,1038,1043,1044
	College	Education and Research Zone	Dakkhin Joara	860,1072,99999,2722,2751,2753,2754,2756,2768,99999,3439,3442,3483,3485,3487,3635,3988,5079,5080
	Jail/Sub-Jail	Governmental Services	Dakkhin Joara	49,457,458,459,797,798,99999,1078,1481,99999,3777,99999
	Madrasha	Education and Research Zone	Horla	691,693,712,965,1010,1046,1048,1057,1059, 1073,1076,1321,1326
			Dakkhin Joara	5,6,7,89,90,204,207,208,225,227,860,875,953,955,956,957,981,99999,1126,1242,1243,1244,1245,1253,1414,1416,1418,1477,1481,1644,1646,1808,1934,1936,1937,1938,1941,1970,1975,99999,2722,2751,2756,2764,2766,2768,3725,4410,99999,4541
	Park	Open Space	Dakkhin Joara	2491,2493,2494,2495,2496,2497,2499,2509,2510,2514,2532,99999
	Play Ground	Open Space	Dakkhin Joara	49,51,53,489,491,492,493,494,495,886,938,940,99999,1310,1311,1414,1424,1429,1739,99999,2667,2668,2669,2681,99999,3725,5085
	Primary School	Education and Research Zone	Dakkhin Joara	809, 822, 965, 1095, 1112, 1114, 1126, 1147, 1198, 1199
	Retail Market	Commercial Zone	Dakkhin Joara	51, 54, 56, 66, 492,493, 495, 496, 498, 940, 943, 955, 957, 1310, 1466, 1739, 1744, 2656,2658,2667,2668

Ward Number	Type of Facilities	Land use Categories	Mouza Name	Plot Number
			Horla	1975, 2039, 2041, 2076, 2080, 2082, 2084, 2085, 2086, 2087, 2099, 2100
	Rickshaw/Van Stand	Transportation Facilities	Horla	112,113,116,117,130,131,242,251,253,254,999,1343,1452,1453,1574,1575,1728,1729,1739,740,1779,1808,99999,3402,3403
	Tempo Stand	Transportation Facilities	Dakkhin Joara	538,574,575,577,578,579,581,582,583,586,886,1592,1593,1595,1596,1599,1604,1605,1606,1607,1624,1629,1641,1654
	Wholesale Market	Commercial Zone	Dakkhin Joara	112,113,116,117,130,131,242,251,253,254,99999,1343,1452,1453,1574,1575,1728,1729,1739,740,1779,1808,99999,3402
Ward No. 07	Community Centre	Community Facilities	Chandanish	133,134,139,140,141,165,191,192,193,194,199,200,201,209,219,242,243
	Community Clinic	Health Services	Chandanish	1095,1112,1113,1114,1197,1198,1199, 1200
	Eidgah	Community Facilities	Chandanish	491,492
	High School	Education and Research Zone	Chandanish	8584, 8647, 8655, 8648, 8653, 8654, 8656, 8666
	Library	Education and Research Zone	Chandanish	8511, 8510, 8509, 8505, 8507, 8508, 8506, 8504, 8502, 8503, 8681
	Low Income Housing	Urban Deferred	Chandanish	9249, 8962, 8968, 9229, 9250, 9228, 8970, 8983, 8969, 8971, 9227, 8972, 9226, 9225, 8982, 8981, 8974, 8973, 9224, 8980, 8979, 8993, 8989, 8988, 8975, 8990, 8976, 8978, 9218, 8992, 8991, 9222, 9217, 8977, 9215, 9016, 9017, 9018, 9214, 460, 461, 457, 463, 462, 466, 467, 464
	Ward Office	Governmental Services	Chandanish	2551, 2552, 2554, 2553, 2555
Ward No. 08	Agro-based Industry	General Industrial Zone	Gacbaria	321, 320, 316, 318, 317, 314, 315, 329, 310
	Bus Terminal	Transportation Facilities	Gacbaria	324, 322, 319, 321, 320
	Community Centre	Community Facilities	Gacbaria	8053, 8054, 8063, 8062, 8064, 251, 252, 8947, 253
	Health Complex	Health Services	Gacbaria	313, 314, 315, 312, 310, 311, 307, 308, 309, 306
	High School	Education and Research Zone	Gacbaria	8584, 8647, 8655, 8648, 8653, 8654, 8656, 8666
	Madrasha	Education and Research Zone	Gacbaria	9087, 9088, 9082, 9083, 9084, 9086, 9089
	Park	Open Space	Gacbaria	1220, 8, 44, 38, 7, 42, 21, 23, 1, 1, 94, 1117, 10
	Play Ground	Open Space	Gacbaria	8585, 8586, 8595, 8587, 8588, 8594, 8584, 8589, 8590, 8591, 8592, 8602, 8653, 8654, 8604, 8603, 8601, 8605, 8666, 8665
	Small Scale Industry	General Industrial Zone	Gacbaria	9612, 9619, 9618, 9613, 9610, 9611, 9614, 9615, 9616, 9617, 9623, 9622, 9625, 9624, 9608, 9626, 9609, 9627, 9628, 9629, 9630, 9607, 9606, 9273, 9601, 9603, 9258, 9274, 9274, 9275, 9259, 9276, 9272, 9605, 9271, 9372, 9373
	Ward Office	Governmental Services	Gacbaria	228, 2, 37, 279, 41, 7, 42, 40, 27, 6, 220, 43, 223, 2
Ward No. 09	Bus Terminal	Transportation Facilities	Gacbaria	5665, 5729, 5663, 5664, 5692, 5662, 5608, 5676, 5690, 5689, 5677, 5691, 5609, 5678, 5610, 5687, 5679, 5688, 5681, 5612, 5680, 5682, 5686, 5683, 5684, 5611, 5685, 5613

Ward Number	Type of Facilities	Land use Categories	Mouza Name	Plot Number
	College	Education and Research Zone	Gacbaria	51, 54, 56, 66, 492,493, 495, 496, 498, 940, 943, 955, 957, 1310, 1466, 1739, 1744, 2656,2658,2667,2668
	Community Clinic	Health Services	Gacbaria	1975, 2039, 2041, 2076, 2080, 2082, 2084, 2085, 2086, 2087, 2099, 2100
	Eidgah	Community Facilities	Gacbaria	112,113,116,117,130,131,242,251,253, 254,99999,1343,1452,1453,1574,1575, 1728,1729,1739,740,1779,1808,9999,3402
	Low Income Housing	Urban Deferred	Gacbaria	454,455,461,462,463,464,465,466,467,468,48 4,486,886,892,918,921,942,948,99999,1199,1 481,1729,1733,1734,1739,2049,99999,2551,2 656,2658,2667,2668,2681,2721,2722,99999,3 393,3448,3624,3625,3631,3703,3777,99999,4 541,4549,4550
	Madrasha	Education and Research Zone	Gacbaria	1035,1318,1334,1336,1339,1341,1342,1344,1 347,1348,1349,1350,1351,1352,1353
	Nursery School	Education and Research Zone	Gacbaria	2323, 2325, 2279, 2278, 2280, 2276, 2277, 2275
	Park	Open Space	Gacbaria	8584, 8647, 8655, 8648, 8653, 8654, 8656, 8666
	Play Ground	Open Space	Gacbaria	8511, 8510, 8509, 8505, 8507, 8508, 8506, 8504, 8502, 8503, 8681
	Primary School	Education and Research Zone	Gacbaria	940,942,943,948,99999,1739,1769,1772,1773 ,1775,1776,1781,1788,1799,1800,1896
	Private Housing	Rural Settlement	Gacbaria	6199, 6169, 67, 6231, 15, 33, 6200, 5, 6168, 4, 29, 16, 6203, 30, 6201, 17, 34, 6128, 36, 6202, 6218, 3, 19, 6127, 6096, 95, 6157, 93, 2, 6100, 6137, 36, 6122, 6120, 3, 52, 51, 4, 6083, 39, 6138, 98, 6104, 17, 18, 2, 9, 3, 6103, 4, 6142, 41, 40, 92, 85, 84
	Public Toilet	Utility Services	Gacbaria	5597, 5595, 5596, 5589, 5594, 5607, 5587, 5586, 5585
	Small Scale Industry	General Industrial Zone	Gacbaria	5,6,7,89,90,204,207,208,225,227,860,875,953 ,955,956,957,981,99999,1126,1242,1243,124 4,1245,1253,1414,1416,1418,1477,1481,1644 ,1646,1808,1934,1936,1937,1938,1941,1970, 1975,99999,2722,2751
	Super Market	Commercial Zone	Gacbaria	5711, 5727, 5728, 5710, 5712, 5709, 5726, 5708, 5706, 5707, 5729, 5716, 5705, 5714, 5715, 5713, 5600, 5605, 5599, 5602, 5603, 5606, 5598, 5572, 5597, 5571, 5595, 5596
	Tempo Stand	Transportation Facilities	Gacbaria	2286, 2282, 2300, 2285, 2290, 2284, 2283
	Truck Terminal	Transportation Facilities	Gacbaria	5596, 5589, 5590, 5594, 5607, 5591, 5576, 5588, 5583, 5587, 5586, 5584, 5585, 5461
	Waste Transfer Station	Utility Services	Gacbaria	1962, 1963

Annexure-8: Detailed Status of Proposed Road Network

Ward No.	Road ID	Road Type	Proposed Status	Length (km)	Width (ft)	Phasing	Priority
Ward No. 01	PR-115	Primary Road	Widening	1.08	80	First Phase	First Priority
	PR-469	Primary Road	Widening	0.46	160	Second Phase	Second Priority
	PR-483	Primary Road	Widening	1.19	80	Second Phase	Second Priority
	PR-484	Primary Road	New Road	0.07	80	Third Phasing	Third Priority
	PR-485	Primary Road	Widening	1.60	80	Third Phasing	Third Priority
	SR-107	Secondary Road	Widening	2.13	40	First Phase	First Priority
	SR-464	Secondary Road	New Road	0.45	60	First Phase	First Priority
	TR-32	Tertiary Road	Widening	0.24	20	Third Phasing	Third Priority
	TR-33	Tertiary Road	New Road	0.35	20	Third Phasing	Third Priority
	TR-34	Tertiary Road	Widening	0.38	20	Third Phasing	Third Priority
	TR-467	Tertiary Road	Widening	0.91	20	Second Phase	Second Priority
	TR-470	Tertiary Road	Widening	0.23	20	Third Phasing	Third Priority
	TR-474	Tertiary Road	Widening	0.40	20	Third Phasing	Third Priority
	TR-475	Tertiary Road	Widening	0.56	20	Second Phase	Second Priority
	TR-477	Tertiary Road	Widening	0.44	20	Second Phase	Second Priority
	TR-60	Tertiary Road	Widening	0.00	20	Second Phase	Second Priority
	TR-63	Tertiary Road	Widening	0.31	20	Third Phasing	Third Priority
	TR-64	Tertiary Road	Widening	0.23	20	Third Phasing	Third Priority
	TR-65	Tertiary Road	Widening	0.15	20	Third Phasing	Third Priority
	TR-66	Tertiary Road	New Road	0.27	20	Third Phasing	Third Priority
	TR-8	Tertiary Road	Widening	0.16	20	Third Phasing	Third Priority
	TR-9	Tertiary Road	Widening	0.06	20	Third Phasing	Third Priority
Ward No. 02	PR-115	Primary Road	Widening	0.87	80	First Phase	First Priority
	SR-106	Secondary Road	Widening	1.10	40	First Phase	First Priority
	TR-13	Tertiary Road	Widening	0.19	20	Third Phasing	Third Priority
	TR-14	Tertiary Road	Widening	0.66	20	Second Phase	Second Priority
	TR-15	Tertiary Road	Widening	0.29	20	Second Phase	Second Priority
	TR-16	Tertiary Road	Widening	0.06	20	Third Phasing	Third Priority
	TR-17	Tertiary Road	Widening	0.12	20	Third Phasing	Third Priority
	TR-35	Tertiary Road	Widening	0.28	20	Second Phase	Second Priority
	TR-36	Tertiary Road	Widening	0.18	20	Second Phase	Second Priority
	TR-37	Tertiary Road	Widening	0.45	20	Second Phase	Second Priority
	TR-475	Tertiary Road	Widening	0.17	20	Second Phase	Second Priority
	TR-477	Tertiary Road	Widening	0.16	20	Second Phase	Second Priority
	TR-58	Tertiary Road	Widening	0.28	20	Second Phase	Second Priority
	TR-59	Tertiary Road	Widening	0.27	20	Second Phase	Second Priority
	TR-60	Tertiary Road	Widening	0.56	20	Second Phase	Second Priority
	TR-61	Tertiary Road	Widening	0.62	20	Third Phasing	Third Priority
	TR-62	Tertiary Road	Widening	0.20	20	Third Phasing	Third Priority
	TR-80	Tertiary Road	Widening	0.33	20	Second Phase	Second Priority
	TR-96	Tertiary Road	Widening	0.81	30	Second Phase	Second Priority
Ward No. 03	PR-115	Primary Road	Widening	0.63	80	First Phase	First Priority
	PR-484	Primary Road	New Road	0.52	80	Third Phasing	Third Priority
	PR-485	Primary Road	Widening	0.37	80	Third Phasing	Third Priority
	PR-486	Primary Road	New Road	0.27	80	Third Phasing	Third Priority
	SR-102	Secondary Road	Widening	1.66	40	Second Phase	Second Priority
	SR-103	Secondary Road	Widening	0.72	40	Second Phase	Second Priority
	SR-111	Secondary Road	Widening	0.86	60	First Phase	First Priority
	TR-38	Tertiary Road	Widening	0.67	20	Third Phasing	Third Priority
	TR-39	Tertiary Road	Widening	0.09	20	Third Phasing	Third Priority
	TR-40	Tertiary Road	Widening	0.23	20	Second Phase	Second Priority
	TR-41	Tertiary Road	Widening	0.59	20	Third Phasing	Third Priority
	TR-42	Tertiary Road	Widening	0.13	20	Third Phasing	Third Priority
	TR-82	Tertiary Road	Widening	0.31	20	Second Phase	Second Priority
Ward No. 04	PR-115	Primary Road	Widening	0.52	80	First Phase	First Priority
	PR-482	Primary Road	New Road	0.51	80	First Phase	First Priority
	PR-486	Primary Road	New Road	0.47	80	Third Phasing	Third Priority
	SR-105	Secondary Road	New Road	0.77	40	First Phase	First Priority
	SR-111	Secondary Road	Widening	1.11	60	First Phase	First Priority
	SR-478	Secondary Road	Widening	0.02	40	First Phase	First Priority
	TR-1	Tertiary Road	Widening	0.61	20	Third Phasing	Third Priority
	TR-472	Tertiary Road	Widening	0.30	20	Third Phasing	Third Priority
	TR-473	Tertiary Road	Widening	0.65	20	Third Phasing	Third Priority
	TR-479	Tertiary Road	Widening	0.73	30	Second Phase	Second Priority
	TR-49	Tertiary Road	Widening	0.32	20	Second Phase	Second Priority
	TR-70	Tertiary Road	Widening	0.66	20	Second Phase	Second Priority

Ward No.	Road ID	Road Type	Proposed Status	Length (km)	Width (ft)	Phasing	Priority
Ward No. 05	TR-86	Tertiary Road	Widening	1.29	30	Second Phase	Second Priority
	PR-482	Primary Road	New Road	1.69	80	First Phase	First Priority
	SR-100	Secondary Road	Widening	1.54	40	Third Phasing	Third Priority
	SR-101	Secondary Road	Widening	1.00	40	Third Phasing	Third Priority
	SR-104	Secondary Road	Widening	0.90	40	Third Phasing	Third Priority
	SR-111	Secondary Road	Widening	0.91	60	First Phase	First Priority
	SR-3	Secondary Road	Widening	0.47	40	Third Phasing	Third Priority
	SR-4	Secondary Road	Widening	0.40	40	Third Phasing	Third Priority
	SR-478	Secondary Road	Widening	0.20	40	First Phase	First Priority
	SR-479	Secondary Road	Widening	0.70	40	Third Phasing	Third Priority
	SR-5	Secondary Road	Widening	0.19	40	Third Phasing	Third Priority
	SR-99	Secondary Road	Widening	1.20	40	Third Phasing	Third Priority
	TR-10	Tertiary Road	Widening	0.84	20	Third Phasing	Third Priority
	TR-43	Tertiary Road	Widening	0.49	20	Third Phasing	Third Priority
	TR-44	Tertiary Road	Widening	0.67	20	Third Phasing	Third Priority
	TR-45	Tertiary Road	Widening	0.84	20	Third Phasing	Third Priority
	TR-46	Tertiary Road	Widening	0.26	20	Third Phasing	Third Priority
	TR-465	Tertiary Road	Widening	0.18	30	Third Phasing	Third Priority
	TR-47	Tertiary Road	Widening	0.40	20	Third Phasing	Third Priority
	TR-479	Tertiary Road	Widening	0.51	30	Second Phase	Second Priority
	TR-48	Tertiary Road	Widening	0.21	20	Third Phasing	Third Priority
	TR-67	Tertiary Road	Widening	0.29	20	Third Phasing	Third Priority
	TR-83	Tertiary Road	Widening	0.75	30	Third Phasing	Third Priority
	TR-84	Tertiary Road	Widening	0.83	30	Third Phasing	Third Priority
	TR-85	Tertiary Road	Widening	0.59	30	Third Phasing	Third Priority
	TR-86	Tertiary Road	Widening	0.08	30	Second Phase	Second Priority
	TR-89	Tertiary Road	Widening	1.71	30	Third Phasing	Third Priority
	TR-95	Tertiary Road	Widening	1.10	30	Third Phasing	Third Priority
Ward No. 06	PR-114	Primary Road	Widening	0.60	80	First Phase	First Priority
	PR-115	Primary Road	Widening	0.31	80	First Phase	First Priority
	PR-482	Primary Road	New Road	1.43	80	First Phase	First Priority
	SR-108	Secondary Road	Widening	0.60	60	First Phase	First Priority
	SR-478	Secondary Road	Widening	0.31	40	First Phase	First Priority
	SR-479	Secondary Road	Widening	0.16	40	Third Phasing	Third Priority
	TR-471	Tertiary Road	Widening	1.13	20	Second Phase	Second Priority
	TR-478	Tertiary Road	Widening	0.32	30	Second Phase	Second Priority
	TR-49	Tertiary Road	Widening	0.33	20	Second Phase	Second Priority
	TR-50	Tertiary Road	Widening	0.29	20	Third Phasing	Third Priority
	TR-51	Tertiary Road	Widening	0.72	20	Third Phasing	Third Priority
	TR-52	Tertiary Road	Widening	0.29	20	Third Phasing	Third Priority
	TR-53	Tertiary Road	Widening	0.16	20	Third Phasing	Third Priority
	TR-54	Tertiary Road	Widening	0.79	20	Third Phasing	Third Priority
	TR-86	Tertiary Road	Widening	0.13	30	Second Phase	Second Priority
	TR-90	Tertiary Road	Widening	0.19	30	Third Phasing	Third Priority
	TR-91	Tertiary Road	Widening	0.11	30	Third Phasing	Third Priority
Ward No-07	TR-92	Tertiary Road	Widening	0.22	30	Second Phase	Second Priority
	TR-98	Tertiary Road	Widening	1.78	30	Third Phasing	Third Priority
	PR-114	Primary Road	Widening	0.46	80	First Phase	First Priority
	PR-115	Primary Road	Widening	0.28	80	First Phase	First Priority
	SR-106	Secondary Road	Widening	0.26	40	First Phase	First Priority
	SR-108	Secondary Road	Widening	2.14	60	First Phase	First Priority
	TR-11	Tertiary Road	Widening	0.79	20	Third Phasing	Third Priority
	TR-12	Tertiary Road	Widening	0.36	20	Third Phasing	Third Priority
	TR-13	Tertiary Road	Widening	0.28	20	Third Phasing	Third Priority
	TR-16	Tertiary Road	Widening	0.11	20	Third Phasing	Third Priority
	TR-17	Tertiary Road	Widening	0.11	20	Third Phasing	Third Priority
	TR-18	Tertiary Road	Widening	0.27	20	Third Phasing	Third Priority
	TR-55	Tertiary Road	Widening	1.16	20	Third Phasing	Third Priority
Ward No. 08	TR-68	Tertiary Road	Widening	0.02	20	Third Phasing	Third Priority
	TR-87	Tertiary Road	Widening	0.37	30	Second Phase	Second Priority
	TR-88	Tertiary Road	Widening	0.51	30	Third Phasing	Third Priority
	TR-96	Tertiary Road	Widening	0.33	30	Second Phase	Second Priority
	TR-97	Tertiary Road	Widening	0.36	30	Third Phasing	Third Priority
	PR-114	Primary Road	Widening	0.96	80	First Phase	First Priority
	PR-469	Primary Road	Widening	0.84	160	Second Phase	Second Priority
Ward No. 08	SR-108	Secondary Road	Widening	0.96	60	First Phase	First Priority
	SR-6	Secondary Road	Widening	0.30	60	First Phase	First Priority
	SR-7	Secondary Road	Widening	1.25	60	First Phase	First Priority
	TR-19	Tertiary Road	Widening	0.48	20	Second Phase	Second Priority

Ward No.	Road ID	Road Type	Proposed Status	Length (km)	Width (ft)	Phasing	Priority
	TR-2	Tertiary Road	Widening	0.02	20	Second Phase	Second Priority
	TR-24	Tertiary Road	Widening	0.20	20	Second Phase	Second Priority
	TR-25	Tertiary Road	Widening	0.50	20	Second Phase	Second Priority
	TR-26	Tertiary Road	Widening	0.38	20	Second Phase	Second Priority
	TR-27	Tertiary Road	Widening	0.35	20	Second Phase	Second Priority
	TR-28	Tertiary Road	Widening	0.37	20	Third Phasing	Third Priority
	TR-29	Tertiary Road	Widening	0.71	20	Third Phasing	Third Priority
	TR-30	Tertiary Road	Widening	0.17	20	Third Phasing	Third Priority
	TR-31	Tertiary Road	Widening	0.52	20	Third Phasing	Third Priority
	TR-467	Tertiary Road	Widening	1.73	20	Second Phase	Second Priority
	TR-69	Tertiary Road	Widening	0.19	20	Second Phase	Second Priority
	TR-71	Tertiary Road	Widening	0.58	20	Second Phase	Second Priority
	TR-73	Tertiary Road	Widening	0.37	20	Second Phase	Second Priority
	TR-74	Tertiary Road	Widening	0.49	20	Second Phase	Second Priority
	TR-75	Tertiary Road	Widening	0.62	20	Third Phasing	Third Priority
	TR-76	Tertiary Road	Widening	0.25	20	Third Phasing	Third Priority
	TR-77	Tertiary Road	Widening	0.59	20	Third Phasing	Third Priority
	TR-93	Tertiary Road	Widening	0.30	30	Third Phasing	Third Priority
Ward No, 09	PR-114	Primary Road	Widening	0.24	80	First Phase	First Priority
	PR-469	Primary Road	Widening	1.36	160	Second Phase	Second Priority
	PR-483	Primary Road	Widening	0.85	80	Second Phase	Second Priority
	SR-106	Secondary Road	Widening	0.95	40	First Phase	First Priority
	SR-108	Secondary Road	Widening	0.24	60	First Phase	First Priority
	SR-109	Secondary Road	New Road	0.44	60	First Phase	First Priority
	SR-110	Secondary Road	Widening	2.20	60	First Phase	First Priority
	SR-464	Secondary Road	New Road	0.05	60	First Phase	First Priority
	SR-485	Secondary Road	Widening	0.19	60	First Phase	First Priority
	SR-6	Secondary Road	Widening	0.16	60	First Phase	First Priority
	TR-2	Tertiary Road	Widening	0.18	20	Second Phase	Second Priority
	TR-20	Tertiary Road	Widening	0.88	20	Second Phase	Second Priority
	TR-21	Tertiary Road	Widening	0.59	20	Third Phasing	Third Priority
	TR-22	Tertiary Road	New Road	0.20	20	Third Phasing	Third Priority
	TR-23	Tertiary Road	Widening	0.09	20	Third Phasing	Third Priority
	TR-24	Tertiary Road	Widening	0.15	20	Second Phase	Second Priority
	TR-467	Tertiary Road	Widening	2.27	20	Second Phase	Second Priority
	TR-468	Tertiary Road	Widening	0.44	20	Second Phase	Second Priority
	TR-476	Tertiary Road	Widening	0.28	20	Second Phase	Second Priority
	TR-55	Tertiary Road	Widening	0.28	20	Third Phasing	Third Priority
	TR-56	Tertiary Road	Widening	0.42	20	Third Phasing	Third Priority
	TR-57	Tertiary Road	Widening	0.33	20	Second Phase	Second Priority
	TR-58	Tertiary Road	Widening	0.02	20	Second Phase	Second Priority
	TR-60	Tertiary Road	Widening	0.25	20	Second Phase	Second Priority
	TR-71	Tertiary Road	Widening	0.53	20	Second Phase	Second Priority
	TR-72	Tertiary Road	Widening	0.45	20	Second Phase	Second Priority
	TR-78	Tertiary Road	Widening	0.34	20	Second Phase	Second Priority
	TR-79	Tertiary Road	Widening	0.31	20	Third Phasing	Third Priority
	TR-81	Tertiary Road	Widening	0.74	20	Second Phase	Second Priority
	TR-93	Tertiary Road	Widening	0.16	30	Third Phasing	Third Priority
	TR-94	Tertiary Road	Widening	1.07	30	Second Phase	Second Priority
	TR-97	Tertiary Road	Widening	0.22	30	Third Phasing	Third Priority

Source: Prepared by consultants'

- Phase 1: 2012-2016
- Phase 2: 2016-2021
- Phase 3: 2021-2025

Annexure-9: Detailed Status of Proposed Drain Network

Ward No.	Drain ID	Drain Hierarchy	Length (m)	Width (ft)	Phasing
Ward No- 01	PD-109	Primary Drain	274.85	1.50	Phase-01
	PD-110	Primary Drain	23.64	1.50	Phase-01
	PD-111	Primary Drain	258.84	1.50	Phase-01
	PD-112	Primary Drain	140.09	1.50	Phase-01
	TD-3	Tertiary Drain	236.61	0.50	Phase-02
	TD-4	Tertiary Drain	308.94	0.50	Phase-02
	TD-5	Tertiary Drain	336.69	0.50	Phase-02
	TD-18	Tertiary Drain	16.94	0.50	Phase-02
	TD-50	Tertiary Drain	408.04	0.50	Phase-02
	TD-51	Tertiary Drain	641.26	0.50	Phase-02
	TD-53	Tertiary Drain	113.98	0.50	Phase-02
	TD-76	Tertiary Drain	1904.52	0.50	Phase-02
	TD-79	Tertiary Drain	808.19	0.50	Phase-02
	TD-82	Tertiary Drain	997.72	0.50	Phase-02
	TD-84	Tertiary Drain	1080.79	0.80	Phase-02
	TD-88	Tertiary Drain	1241.30	0.80	Phase-02
	TD-91	Tertiary Drain	399.31	0.80	Phase-02
	TD-92	Tertiary Drain	57.35	0.80	Phase-02
Ward No- 02	PD-113	Primary Drain	327.86	1.50	Phase-01
	TD-2	Tertiary Drain	551.44	0.50	Phase-02
	TD-6	Tertiary Drain	396.74	0.50	Phase-02
	TD-7	Tertiary Drain	248.03	0.50	Phase-02
	TD-9	Tertiary Drain	151.71	0.50	Phase-02
	TD-16	Tertiary Drain	251.53	0.50	Phase-02
	TD-17	Tertiary Drain	234.51	0.50	Phase-02
	TD-18	Tertiary Drain	480.21	0.50	Phase-02
	TD-19	Tertiary Drain	158.40	0.50	Phase-02
	TD-37	Tertiary Drain	299.94	0.50	Phase-02
	TD-52	Tertiary Drain	127.07	0.50	Phase-02
	TD-54	Tertiary Drain	288.81	0.50	Phase-02
	TD-55	Tertiary Drain	298.05	0.50	Phase-02
	TD-56	Tertiary Drain	240.68	0.50	Phase-02
	TD-62	Tertiary Drain	466.19	0.50	Phase-02
	TD-75	Tertiary Drain	888.94	0.50	Phase-02
	TD-88	Tertiary Drain	1567.78	0.80	Phase-02
Ward No- 03	PD-114	Primary Drain	203.77	1.50	Phase-01
	PD-115	Primary Drain	519.12	1.50	Phase-01
	PD-116	Primary Drain	102.77	1.50	Phase-01
	TD-39	Tertiary Drain	270.54	0.50	Phase-02
	TD-47	Tertiary Drain	370.25	0.50	Phase-02
	TD-48	Tertiary Drain	219.24	0.50	Phase-02
	TD-49	Tertiary Drain	73.44	0.50	Phase-02
	TD-67	Tertiary Drain	115.90	0.50	Phase-02
	TD-70	Tertiary Drain	651.92	0.50	Phase-02
	TD-72	Tertiary Drain	1475.90	0.50	Phase-02
	TD-84	Tertiary Drain	669.30	0.80	Phase-02
	TD-90	Tertiary Drain	232.03	0.80	Phase-02
	TD-92	Tertiary Drain	453.15	0.80	Phase-02
Ward No- 04	TD-23	Tertiary Drain	588.28	0.50	Phase-02
	TD-24	Tertiary Drain	537.31	0.50	Phase-02
	TD-25	Tertiary Drain	582.07	0.50	Phase-02
	TD-60	Tertiary Drain	654.47	0.50	Phase-02
	TD-65	Tertiary Drain	1335.04	0.50	Phase-02
	TD-67	Tertiary Drain	1635.35	0.50	Phase-02
	TD-74	Tertiary Drain	47.83	0.50	Phase-02
	TD-80	Tertiary Drain	444.35	0.50	Phase-02
	TD-85	Tertiary Drain	672.91	0.80	Phase-02
	TD-90	Tertiary Drain	410.03	0.80	Phase-02
	TD-71	Tertiary Drain	266.00	0.50	Phase-02
	PD-117	Primary Drain	735.81	1.50	Phase-01

Ward No.	Drain ID	Drain Hierarchy	Length (m)	Width (ft)	Phasing
Ward No- 05	PD-118	Primary Drain	599.96	1.50	Phase-01
	PD-119	Primary Drain	754.19	1.50	Phase-01
	PD-120	Primary Drain	229.87	1.50	Phase-01
	PD-121	Primary Drain	188.34	1.50	Phase-01
	TD-21	Tertiary Drain	210.11	0.50	Phase-02
	TD-60	Tertiary Drain	454.44	0.50	Phase-02
	TD-61	Tertiary Drain	990.81	0.50	Phase-02
	TD-68	Tertiary Drain	2253.71	0.50	Phase-02
	TD-69	Tertiary Drain	1052.85	0.50	Phase-02
	TD-73	Tertiary Drain	1541.87	0.50	Phase-02
	TD-74	Tertiary Drain	350.13	0.50	Phase-02
	TD-77	Tertiary Drain	477.45	0.50	Phase-02
	TD-80	Tertiary Drain	1503.45	0.50	Phase-02
	TD-93	Tertiary Drain	262.64	0.80	Phase-02
	TD-95	Tertiary Drain	817.87	0.80	Phase-02
Ward No- 06	TD-127	Tertiary Drain	322.33	0.50	Phase-02
	TD-83	Tertiary Drain	1516.30	0.80	Phase-02
	TD-10	Tertiary Drain	580.87	0.50	Phase-02
	TD-11	Tertiary Drain	252.06	0.50	Phase-02
	TD-44	Tertiary Drain	1002.80	0.50	Phase-02
	TD-58	Tertiary Drain	274.01	0.50	Phase-02
	TD-59	Tertiary Drain	190.06	0.50	Phase-02
	TD-64	Tertiary Drain	1574.81	0.50	Phase-02
	TD-66	Tertiary Drain	83.91	0.50	Phase-02
	TD-74	Tertiary Drain	74.09	0.50	Phase-02
	TD-80	Tertiary Drain	1219.41	0.50	Phase-02
	TD-20	Tertiary Drain	159.52	0.50	Phase-02
	TD-41	Tertiary Drain	133.18	0.50	Phase-02
Ward No- 07	TD-40	Tertiary Drain	252.34	0.50	Phase-02
	TD-42	Tertiary Drain	720.19	0.50	Phase-02
	TD-43	Tertiary Drain	656.89	0.50	Phase-02
	PD-122	Primary Drain	691.03	1.50	Phase-01
	PD-123	Primary Drain	325.56	1.50	Phase-01
	PD-113	Primary Drain	90.61	1.50	Phase-01
	SD-98	Secondary Drain	136.73	1.00	Phase-02
	SD-99	Secondary Drain	200.63	1.00	Phase-02
	TD-12	Tertiary Drain	1050.19	0.50	Phase-02
	TD-26	Tertiary Drain	880.38	0.50	Phase-02
	TD-57	Tertiary Drain	322.58	0.50	Phase-02
	TD-62	Tertiary Drain	553.90	0.50	Phase-02
Ward No- 08	TD-63	Tertiary Drain	309.66	0.50	Phase-02
	TD-75	Tertiary Drain	457.83	0.50	Phase-02
	TD-81	Tertiary Drain	1508.36	0.50	Phase-02
	TD-87	Tertiary Drain	861.03	0.80	Phase-02
	TD-88	Tertiary Drain	427.71	0.80	Phase-02
	SD-100	Secondary Drain	1.24	1.00	Phase-02
	SD-104	Secondary Drain	174.06	1.00	Phase-02
	SD-105	Secondary Drain	336.93	1.00	Phase-02
	SD-106	Secondary Drain	451.21	1.00	Phase-02
	SD-107	Secondary Drain	304.75	1.00	Phase-02
	SD-124	Secondary Drain	462.62	1.00	Phase-02
	SD-126	Secondary Drain	147.64	1.00	Phase-02
	SD-108	Secondary Drain	642.64	1.00	Phase-02
	TD-1	Tertiary Drain	338.40	0.50	Phase-02
	TD-22	Tertiary Drain	163.45	0.50	Phase-02
	TD-27	Tertiary Drain	22.84	0.50	Phase-02
	TD-28	Tertiary Drain	961.14	0.50	Phase-02
	TD-30	Tertiary Drain	327.88	0.50	Phase-02
	TD-31	Tertiary Drain	437.80	0.50	Phase-02
	TD-32	Tertiary Drain	543.43	0.50	Phase-02
	TD-33	Tertiary Drain	208.68	0.50	Phase-02
	TD-34	Tertiary Drain	522.66	0.50	Phase-02
	TD-45	Tertiary Drain	422.68	0.50	Phase-02

Ward No.	Drain ID	Drain Hierarchy	Length (m)	Width (ft)	Phasing
	TD-78	Tertiary Drain	265.93	0.50	Phase-02
	TD-79	Tertiary Drain	1595.98	0.50	Phase-02
	TD-87	Tertiary Drain	1538.31	0.80	Phase-02
	TD-89	Tertiary Drain	1107.04	0.80	Phase-02
Ward No- 09	SD-100	Secondary Drain	334.33	1.00	Phase-02
	SD-101	Secondary Drain	193.75	1.00	Phase-02
	SD-102	Secondary Drain	322.93	1.00	Phase-02
	SD-103	Secondary Drain	138.02	1.00	Phase-02
	SD-104	Secondary Drain	135.72	1.00	Phase-02
	TD-12	Tertiary Drain	235.19	0.50	Phase-02
	TD-13	Tertiary Drain	365.66	0.50	Phase-02
	TD-14	Tertiary Drain	291.55	0.50	Phase-02
	TD-15	Tertiary Drain	940.00	0.50	Phase-02
	TD-16	Tertiary Drain	12.38	0.50	Phase-02
	TD-18	Tertiary Drain	228.55	0.50	Phase-02
	TD-27	Tertiary Drain	144.95	0.50	Phase-02
	TD-28	Tertiary Drain	34.82	0.50	Phase-02
	TD-29	Tertiary Drain	393.68	0.50	Phase-02
	TD-35	Tertiary Drain	297.17	0.50	Phase-02
	TD-36	Tertiary Drain	275.65	0.50	Phase-02
	TD-38	Tertiary Drain	650.80	0.50	Phase-02
	TD-46	Tertiary Drain	245.82	0.50	Phase-02
	TD-63	Tertiary Drain	194.52	0.50	Phase-02
	TD-75	Tertiary Drain	725.73	0.50	Phase-02
	TD-78	Tertiary Drain	132.88	0.50	Phase-02
	TD-79	Tertiary Drain	2041.30	0.50	Phase-02
	TD-82	Tertiary Drain	812.81	0.50	Phase-02
	TD-86	Tertiary Drain	1952.53	0.80	Phase-02
	TD-87	Tertiary Drain	433.14	0.80	Phase-02
	TD-91	Tertiary Drain	32.83	0.80	Phase-02
	TD-94	Tertiary Drain	12.66	0.80	Phase-02
	TD-96	Tertiary Drain	169.84	0.80	Phase-02
	TD-125	Tertiary Drain	262.47	0.80	Phase-02
	TD-97	Tertiary Drain	529.42	0.80	Phase-02

Source: Prepared By Consultants'

- Phase 1: 2012-2016
- Phase 2: 2016-2021
- Phase 3: 2021-2025