



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

**KALKINI PAURASHAVA  
MASTER PLAN: 2011-2031**

January 2015



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**Local Government Division**

## **KALKINI PAURASHAVA MASTER PLAN: 2011-2031**

### **STRUCTURE PLAN**

#### **URBAN AREA PLAN:**

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

### **WARD ACTION PLAN**

January 2015



**KALKINI PAURASHAVA**  
**KALKINI, MADARIPUR**

# **KALKINI PAURASHAVA MASTER PLAN: 2011-2031**

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# **KALKINI PAURASHAVA MASTER PLAN: 2011-2031**



## 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, Kalkini Paurashava had initiated steps to frame its' Master Plan (Physical Development Plan) by taking technical assistance from the Local Government Engineering Department (LGED). LGED under the Local Government Division of the Ministry of Local Government, Rural Development and Cooperatives initiated a project titled 'Upazila Towns Infrastructure Development Project (UTIDP)' providing all sorts of technical assistances to prepare long term physical development plan titled 'Master Plan' for Kalkini Paurashava.

Master Plan of Kalkini Paurashva has been prepared following the pre-requisite of the Local Government (Paurashva) Act, 2009. To prepare the Master Plan, LGED engaged consulting firm named 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. Pourashava 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 Kalkini Pourashava together with land use control and effective management of service facilities.

The Paurashva 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 Kalkini Paurashava will be necessary to implement this Master Plan successfully and make this Paurashava developed and livable. I hope Kalkini Paurashava will be a

model Paurashava in Bangladesh through building itself green and sustainable by successful implementation of this Master Plan.

(.....)

Mayor,

Kalkini Paurahsava

## EXECUTIVE SUMMARY

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

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

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

This is the primary effort of planned development for the Kalkini Paurashava, guided by the LGED under Package-10 of the Upazila Towns Infrastructure Development Project (UTIDP). It is expected that the implementation of the plan will induce higher level of development, ensure planned life, good community and better future of the Paurashava inhabitants.

The Kalkini Paurashava is located in the Kalkini Upazila under Madaripur Zila, between 23° 00' and 23° 10' north latitudes and between 90° 06' and 90° 21' east longitudes. The Paurashava is bounded on the north by Madaripur Sadar Upazila, on the east by Arialkha River and Barisal Zila on the south and west.

The Paurashava is ‘Ga’ category (the term ‘Ga’ is the Bengali word means third category or ‘C’ category. The concern Ministry uses this word for fund allocation and administrative



arrangement) and consists with 9 Wards and 33 mouzas. The Paurashava is located at southwestern part of Bangladesh and about 85 km. (through Maowa) away from the Dhaka City. For the preparation of master plan, an area of 7473.20 acres (30.30 sq. km.) consider as Planning area and at the same time Structure Plan area also.

According to the Census Year 2001, 38498 populations are living in the planning area with gross density 5 persons per acre and it will be 64125 in 2031 with gross density 9 persons per acre.

In the Paurashava, agriculture occupies 5218.61 acres and residential and circulation network occupy 1186.46 acres and 73.30 acres of land respectively. An area of 649.44 acres is covered with water bodies.

The Paurashava is a naturally developed area. Planning effort yet not been taken by the public authority. Therefore, a mixed landuse scenario is viewed all over the Paurashava. About 4 to 6 meter earth filling will be needed for every development activities in the Paurashava. So, bulk development should not be encouraged due to the huge cost involvement.

Almost all the Wards have no sewerage system and toilets are mostly consists of sock pits. Overall garbage disposal system is poor. Solid Waste Dumping Ground is not available and mostly disposes on open streets. Wastes collect by the NGOs but not well organized all over the planning area.

Kalkini Paurashava bears rural influences and agriculture is the major source of income. Average monthly income per household is Tk.10415. No substantial saving of the income is found.

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

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

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

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

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## LIST OF ABBREVIATIONS AND ACRONYMS

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



# CHAPTER 1

## 1. INTRODUCTION

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

### 1.1 Background of the Paurashava

As per the Local Government (Paurashava) Act 2009, the Paurashavas of Bangladesh categorize as A, B and C classes based on annual income of the Paurashava. There is also a separate category called “Special Class”, for industrial and commercial hubs of Narayanganj and Tongi within the Dhaka Metropolitan Development Area (DMDA). Kalkini is a C category Paurashava with an area 30.30 sq.km. includes 33 mouzas and 9 Wards.

The Kalkini Paurashava is located in the Kalkini Upazila under Madaripur Zila, between 230 00’ and 230 10’ north latitudes and between 900 06’ and 900 21’ east longitudes. The Paurashava consists with 9 Wards and 33 mouzas. The Paurashava is located at southwestern part of Bangladesh and about 85 km. (through Maowa) away from the Dhaka City.

The Kalkini Paurashava was established in 14th January 1997 under the jurisdiction of Kalkini Upazila of Madaripur Zila. The Paurashava is ‘Ga’ category (the term ‘Ga’ is the Bengali word means third category or ‘C’ category. The concern Ministry uses this word for fund allocation and administrative arrangement). In total, 33 mouzas are fully or partly involved in the Paurashava boundary. Total area of the Paurashava identified by the Gazette Notification is 27.0 sq. km. (6750.0 acres). With the active participation of the Paurashava authority, the Consultant has identified the Paurashava’s existing jurisdiction area which is 30.30 sq. km. (7473.20 acres) consisted with 9 Wards. The variation (30.30 sq. km. instead of 27.0 sq. km.) happened due to the modern technology uses by the Consultant for area calculation. Among the nine Wards, Ward No. 3 is occupied largest area which is 5.4 sq. km. and Ward No. 7 is smallest (1.9 sq. km).

Kalkini, the largest Paurashava in Madaripur Zila in respect of area, came in to existence in 1918. Nothing is definitely known about the origin of the Upazila name. It is learnt that at the time of creation of the Thana one Mr. Kalkolini was posted as a Deputy Commissioner of former Faridpur district. It is generally believed that the Upazila might have been named Kalkini after the name of that man.

Physiographically, Kalkini Paurashava area is same as other Paurashavas (who are on floodplain land) in Bangladesh. It's southern, northern and eastern parts are covered by agriculture land. Two branch of Padma River flows from north to south on the eastern and western parts of the Paurashava. The Paurashava is consisted with 9 Wards. Ward No. 1, 2 and 7 are developed than other Wards.

During demarcation of planning area for Structure Plan, the urban development along both sides of the major inter-district road network and around the market places was given importance. Development along the Dhaka–Barisal via Madaripur Road has also considered.

The area considered for structure plan area is larger than the area prescribed through the Gazette Notification. Cause of such change is the development trend considered by the Consultant.

Nature of the plan means that its contents should remain valid for the duration of the plan. However, in the rapidly changing circumstances of urban development in Bangladesh, it is prudent that the plan is reviewed at regular intervals, of say 5 years.

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

Location	Area (acre)	Area (sq.km.)	2001		2031	
			Population	Gross density / acre	Population	Gross density / acre
Kalkini Paurashava	7473.20	30.30	38498	05	64125	09

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

## 1.2 Objectives of the Structure Plan

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

- Description of the Paurashava's administrative, economic, social, physical environmental growth, functional linkage and hierarchy in the national and regional context; catchment 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 Kalkini Paurashava.

- Discussion of relevant policies to analyze and find out potential scopes for the use in the present exercise and also find out constraints and weakness of the existing policy to suggest appropriate measures for the development and management of Kalkini Paurashava.
- To provide land use development strategies.
- To provide strategies and policies for sectoral as well as socio-economic, infrastructural and environmental issues of development.
- To discuss about implementation issues including institutional capacity building and strengthening of Paurashava, resource mobilization etc.

### **1.3 Concepts, Content and Format of the Structure Plan**

#### **Conceptualization**

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

Structure Plan is the 1st component of the Master Plan package. The other two lower level components are Urban Area Plan and Ward Action Plan. Structure Plan lays down the framework of the future plan including strategy and the sectoral policies. The Urban Area Plan and the Ward Action Plan detail out development proposals under the framework of Structure Plan. The extended area was selected in consultation with the Paurashava for possible extension of the Paurashava. But no development proposals are suggested for the extended part as existing Paurashava area is enough to accommodate population and services during Structure Plan period, that is, up to the year 2031.

#### **Contents**

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 feature 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 (BMs) established by RTK-GPS Static survey, 120 nos. of Secondary Bench Marks/Control, Point (BMs/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 12th June, 2009. An introduction meeting on 12th June, 2009 was held in Kalkini Paurashava in presence of the Mayor, Councilors, Engineers and other professional to set the date and time of survey as well as to identify the survey stations.

The Paurashava authority recommended 13-06-09 as local Hat day and 14-06-09 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 Paurashava Mayor, Councilors, Engineers and other concerned officials as well as the general inhabitants to determine pollution in air, water, land and noise. Based on the information

and data collected from the field, 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 January '09 and ending in March '09. The Survey Team was composed with 6 field investigators assisted by Field Supervisor. The Supervisor has been seconded from Consultant's office. The survey took approximately two weeks to complete with a pre-determined set of questionnaire.

The Paurashava 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.

### **Format of the Structure Plan**

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

## **1.4 Approach and Methodology**

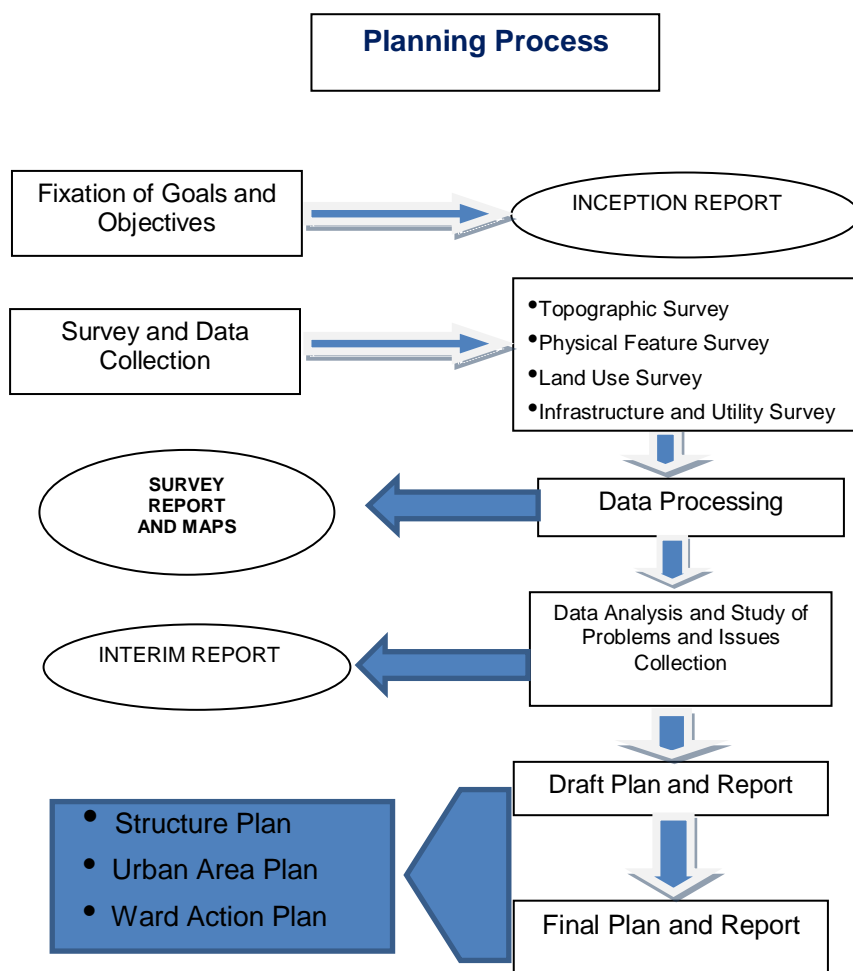
The UTIDP Project is aimed for substantial development of infrastructure and services for the Paurashava with optimum provision of opportunities for Paurashava dwellers and making scope for extending services to surrounding areas.

The current project is preparing a Master plan of the Paurashava, where the existing condition and different problems are identified, studied and analyzed and the probable solutions are to be sought to ameliorate the same. The study moves through a process of data collection-analysis and fixation of objectives for planning. The approach is based on field survey for data collection and collection of information from secondary sources.

The data is presented through maps, text and tabular form. Then the survey report and maps are prepared and submitted. Analysis of collected data is carried out to identify the nature and extent of problems prevailing in the Paurashava in order to fix the objectives of the actions to be undertaken in the form of planning and the interim report prepared and submitted. Through the process, involvement of the stakeholders has been ensured

to make the planning as much sustainable as possible. For this purpose, continuous formal and informal discussions and meetings have been carried out throughout the project period using participatory approach. The discussions serve two purposes, first, a sense of belongingness develops within the minds of the stakeholders, particularly among the citizens, about the master plan to be prepared, and secondly, identification of problems and finding their solutions become easier with the participation of stakeholders, as the local stakeholders are more knowledgeable about local problems and possible solutions of those problems.

**Figure 1.1: Flow Chart of Planning Process**



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

## 1.5 Scope of Work

The scope of work under this consultancy services covers all aspects related to the preparation of Master Plan, which includes Land Use Plan, Transportation and Traffic

Management Plan, Drainage and Environmental Management Plan and Ward Action Plan for the proposed Paurashava. In order to prepare these plans, the activities contain but not limited to the following:

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

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

- m. A total list of primary and secondary roads, drains and other social infrastructures for each Paurashava for a plan period of next 20 years has been made. Examining and classifying according to the existing condition, long, medium and short term plans have been proposed and estimated cost for improvement of drain and road alignment and other infrastructures have been prepared.
- n. In line with the proposed Master Plan, a Ward Action Plan has been proposed with list of priority schemes for the development of roads, drains, traffic management and other social infrastructures for implementation during the first five years of plan period.
- o. With the help of concerned Paurashava, at least 2 public consultation meetings or seminars have been organized, one for discussion on Interim Report and the other on draft Final Report on the proposed Master Plan. Beneficiary's point of view has been integrated in the plan with utmost careful consideration.
- p. Preparation and submission of Master Plan and Report with required standards as per the TOR.

## 1.6 Organization of the Master Plan Report

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

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

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

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

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

**Map 1.1: Location of Kalkini Paurashava in context of Bangladesh**





**Map 1-2: Jurisdiction of Structure Plan Area**



## CHAPTER 2

### 2. PAURASHAVA'S EXISTING TREND OF GROWTH

#### 2.1 Social Development

**Age-sex structure:** Age and gender distribution indicates that population mostly increase naturally. The age-sex distribution implies that female population is less than male population in the Paurashava. From the male female ratio, it is observed that in all the Wards number of males are greater than the number of females. Population aged 16 to 25 year is highest in the Ward No. 4 and 5 rather than population aged 26 to 57 year. So, in all the Wards number of young and workable population is highest than any other age-group population. Again, population aged 57 years and above is found in the Ward No. 6, 7, 8 and 9 and this percentage is near about same as the age-group 6 to 15 years. Average sex ratio is 53:47 in the Kalkini Paurashava. Male–Female ratio is same (50:50) in the Ward No. 1 and 7. Highest difference of male-female ratio is 56:44 found in the Ward No. 2, 4 and 9 (57:43).

**Household size:** Household size ranges from 1-3, 4-6, 7-9, 10-12 and 12+ members, but most prevalent size is 4-6 members in the Paurashava and also in Bangladesh. There are both single and joint family systems in the study area. The table below gives a picture in respect of family size and dominant family type. Ward No. 3 is conceived highest percentage (75.5%) of 4-6 member family and Ward No. 3 and 4 is more joint-family system (40% each) compared to other Wards. Most of the family in the Paurashava is single family (72%).

Lowest number of average family size in the Paurashava is 1.0%. Those families are living in the Ward No. 2, 3, 5 and 6. A good number of 10-12 family members in a family prevail in all the Wards except Ward No. 3, 7 and 9 and highest percentage is found in the Ward No. 5 and 8 (12.8% each). Single or nuclear family is the prominent family size in the Paurashava, confirming the urban character. Nuclear family is highest in all the Wards than joint family. Highest percentage of nuclear family is found in the Ward No. 4 (88%) and lowest in the Ward No. 3 and 6 (60% each).

**Marital status:** In the Paurashava, 10 years and over population for the purpose of marriage is 28128, among them male is 14109 and female 14019. Number of male married is lower than female married. Again, number of female divorce is higher than male divorce. The scenario proves family conflict generates due to the financial insolvency of the household head. The unmarried or never married data on male and female also proves that the male population is not encouraged to marry due to their minimum income ability.

**Migration:** The Paurashava is almost formed with permanent settlers (81.7%). As the survey result reveals, those peoples are living in Paurashava for more than 14 years. But interestingly, the survey also highlighted few Wards where people are living during less than 2 years (1.7% in Ward No. 1, 6.4% in Ward No. 2 and 4% in Ward No. 3). This is ascribed to that population who are employees in government, semi-government and private organization.

Migration status of the Paurashava is stable because only 14% resident of the Paurashava is migrated resident. Maximum migrated resident is found in the Ward No. 5 (56%) and a good number in Ward No. 1, 3 and 4 (20%, 16% and 16% respectively). Almost every Ward is involved with the migration of population except the Ward No. 6.

There are various reasons for migration like inadequacy of employment opportunity, economic backwardness, social persecution, politico-religious disturbances in the area where they migrated from and ambition like better business opportunity. But mostly, as survey finds out, migration in the study area occurred due to the security and service purpose (19% each of the total migration). Purposes of business (15%), attracted by urban facilities (15%) and better education (16%) are another cause of migration.

All migration has occurred after the year 2000. Basically, it was in migration. It is very clear that better earning opportunity influences the people to live in urban area from other parts of the district or country. But, in this Paurashava all the opportunities is not sufficient and for this reason a little migration is prevailed. Out migration has occurred in the urban area at household level but there is some students and service holders who migrate Dhaka or other large cities. Among the migrated resident of the Paurashava, 60% came from the same Upazila, 29% from other Upazilas of the district and rest 11% from other districts of the country.

**Educational status:** There are large numbers of household heads who are illiterate (52.5% in Ward No. 6, 31.9% in Ward No. 8, 29.8% in Ward No. 2, etc.). Reading between Classes-I to V is the highest educational achievement in the Paurashava (35.9%). SSC level (10.4%), HSC (6.3%) and Graduate (4.6%) is quite low. A large percentage of population in the study area is Class VI-X (18.7%). There are few masters degree holders (1.3%) in the study area and they are found only in the Ward No. 1 (3.3%), 4 (4%), 5 (2.6%) and 9 (2.1%).

**Religion:** In the Paurashava, Muslims are major religious group (99%) followed by Hindus (1%). During the field survey, no Buddhist and Christian households are identified. Hindu religious population is found in the Ward No. 6, 7 and 9. Again, 100% Muslims are found in the Ward No. 1, 2, 3, 4, 5 and 8. Highest number of Hindu religious population is in the Ward No. 9 (6%) and lowest in the Ward No. 6 (2%).

## Occupational status

**Primary occupation:** It is evident that, around 22% of the respondents are engaged in business activities (large business 2% and small business 20%). The scenario reveals that 12% as office workers both government and semi-government including employees in private offices. The transportation workers comprising rickshaw and van pullers accounts for 2% of the total occupation group in the study area. Agriculture with allied farming seems to be the major occupation (50%). Ward-wise main occupation ranges from government officer, government employee, teachers, farmers, businessmen (large and small), labour (skilled and unskilled), rickshaw/van puller, private service, housewives and retired/unemployed persons.

Small business is the dominant occupation in three Wards (Ward No. 4, 5 and 7). Farming/agricultural domination is found in six Wards (Ward No. 1, 2, 3, 6, 8 and 9). Paurashava has numerous occupational groups who are helping the economic base to sustain. Being predominantly in an agricultural region, the inhabitants of Paurashava are changing their major occupational involvement from agriculture to business.

**Table 2.1: Occupational pattern (in %)**

Main Occupation of the Household head	Ward Number									Paurashava As a whole
	1	2	3	4	5	6	7	8	9	
Govt. Officer	15	15	2	4	5	0	5	4	2	6
Other Govt. employee	5	0	2	0	0	0	5	0	4	2
Teaching	8	2	2	8	0	10	5	2	0	4
Farming/Agriculture	30	49	60	20	39	80	26	81	60	50
Housewife	2	0	2	0	0	0	0	0	0	1
Large Business	10	0	0	4	0	0	3	0	0	2
Small Business	18	23	6	44	41	10	36	0	19	20
Private Service	2	4	0	20	3	0	5	0	6	4
Handicrafts	0	0	4	0	0	0	0	0	0	1
Skilled Labour	3	6	8	0	5	0	8	6	0	4
Rickshaw/Van Driver	2	0	4	0	5	0	0	4	4	2
Unemployed/Retired	5	0	10	0	3	0	8	2	4	4

Source: Socio-economic Survey, 2009.

Farming or agriculture (50%) is the dominant occupation. Small business (20%) is the second highest occupation of the household heads in the Paurashava. Agriculture or farming includes crops, livestock and poultry and fish cultivation. Apart from this there are other occupations like public or private service, informal sector work, rickshaw/van puller, teaching, skilled and unskilled labour, handicrafts, etc.

**Secondary occupation:** A number of households are engaged with secondary occupation seasonally to raise their family income. Mostly the low-income groups are with secondary occupations during off-season when they do not have any regular jobs. Secondary jobs include, day labouring, hawkery, van/rickshaw pulling and similar other occupations. Percentage of such involvement is 2%. A substantial number of populations of the Ward

No. 1, 3, 5, 8 and 9 are involved with the rickshaw and van pulling occupation. Among those involvements, 2% is found in the Ward No. 1, 4% each in the Ward No. 3, 8 and 9 and 5% in the Ward No. 5.

**Income level:** About 25% of the respondent's sources of income are business followed by 14% service, 45% agriculture, 1% house rent and rest (15%) by other activities. Most of the Paurashava residents depend on small business activities and some development has taken place because of government establishments, Kalkini Bus Stand and about middle of the Dhaka-Madaripur and Dhaka-Barisal. In Ward No. 2, 3, 5, 6, 8 and 9, agriculture is the highest source of income of the respondent and business as a highest source of income is found in Ward No. 1 and 4. Service is dominant in the Ward No. 4. Therefore, Kalkini as a small Paurashava has a great potentiality to develop small business based on the agriculture products which may create a better employment opportunity.

Present population distribution and growth including migration shows that the area is developing significantly in terms of trade and large business and trying to get out of agriculture based activity. Income ranges basically support this concept which is evident by the ranges of income earned by households. In Ward No. 5, 26% household earns Tk.9001-12000 compared to 13% within Tk.6001-9000 per month. There are good numbers of households (12%) who earn Tk.12000+ per month. Tk.6001-9000 income group is dominant income group in the Paurashava (34%). Average monthly income per household is Tk. 10415. On the other hand, average monthly income per household is highest (Tk.11620) in Ward No. 4 and lowest (Tk.6159) in Ward No. 7.

**Expenditure level:** Expenditure pattern of the Paurashava as a whole conforms to the general pattern of household expenditure. There are several headings like food, house rent, basic utility charge, education, health, transportation/vehicle charge, recreation and other charges, etc.

Since Kalkini Paurashava still has rural influences and agriculture is the main source of income and average monthly income remain small; food relatively stands higher in expenditure list; Tk.6700 in Ward No. 4 and Tk. 4509 in Paurashava as a whole. Important finding is that, there is lowest expenditure for water in all the Wards of the Paurashava. The residents of the Paurashava save a little money. People of the Ward No. 1 save highest amount of money (Tk.1921/month). Lowest savings is found in the Ward No. 4 (Tk. 696/month).

### **Land Value**

Land value is an important determinant for any project related to the physical development because; the development depends on project cost and the cost on land value. In recent time, a rapid change of land value is found in the Paurashava premises.

Wealthy people of the community are investing on land and became landlord because they consider it as a safe investment. As a result, land value curve is on upward. Value of land depends on location, accessibility, height and free of natural hazards. Following paragraphs discuss on land value of the planning area.

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

In this study, seven types of land in 24 mouzas are being considered. In the natural land market, land for homestead / housing construction (called Viti) is higher than other type of land and this scenario is prevailing in the Paurashava also. Land value is low (Tk.2000 to Tk. 8000 per decimal) for Doba and Pond type of land. Those two types of land are under the jurisdiction of agriculture land. For development activities, in case of land cost, those lands should be emphasized, though land development cost is higher than other type of lands.

**Existing Practice/Unofficial Value:** Land value increases with the height of land. It increases from low to medium high land but the maximum mean value is found for the habitable land (Tk.43279 per decimal) and lowest for the other land (Tk.64 per decimal). Average land value in the Paurashava is Tk.19756 per decimal. In Ward-wise scenario, land value is highest in Ward No. 7 (Tk.46294 per decimal) and Ward No. 9 (Tk.37310 per decimal) which implies the significance of core area. On the other hand, land value is lowest in Ward No. 3 (Tk.6068 per decimal) which implies that this Ward has abundant agricultural low land. Habitable land in Ward No. 7 bears highest value (Tk.58711 per decimal) and low land in Ward No. 3 bears the lowest land value (Tk.1220 per decimal).

**Table 2.2: Mouza-wise land value in the Study Area, 2009**

Mouza	Land value according to land type (Taka/Decimal)						
	Viti	Chala	Nal	Pukur	Doba	Tek	Bagan
Rajdi	50050	40355	10263	8000	5000	12000	16000
Pangasia	30500	20500	10500	6000	3500	8800	18000
Patabali	30500	27000	10500	4500	2000	8000	16800
Uttar Thengamara	27000	16000	8000	6600	3500	8000	18000
Char Fatebahadur	29500	24500	12030	5500	3000	8000	27500
Sikarmongol	24700	18800	10500	7500	4000	9000	20000
Char Jhautala	29090	20590	10060	4500	3000	6000	24500
Char Krisnanagar	15500	12680	6500	4500	3000	6800	15000
Lamchari	27000	20000	10000	6600	3500	7000	18000
Bibhagdi	20050	16500	9030	4500	3500	8000	15000
Darirchar Laxmipur	32050	28355	14263	8000	5000	12000	16000
Char Sadipur	18500	14500	7500	6000	3500	8800	18000



Uttar Krisnanagar	18500	13500	5500	4500	2000	8000	16800
Char Kasimpur	17000	15000	9000	6600	3500	8000	18000
Kastagar	19050	16500	8530	5500	3000	8000	27500
Laxmipur Pakhira	15700	12800	6500	7500	4000	9000	20000
Jhautala	29090	21590	10060	4500	3000	6000	24500
Badardi	15500	10680	5500	4500	3000	6800	15000
Dakkhin Janardandi	27000	21000	10500	6600	3500	7000	18000
Purba Minajdi	10050	9500	4530	4500	3500	8000	15000
Ramnagar	29090	21590	10060	4500	3000	6000	24500
Uttar Janardandi	10500	8680	4500	4500	3000	6800	15000
Puali Madaripur	27000	22000	12000	6600	3500	7000	18000
Gopalpur	10050	8500	4530	4500	3500	8000	15000

Source: Sub-Registry Office, 2009.

**Land Ownership Types and Patterns:** Status of residence or ownership of dwelling units / land is a key socio-economic indicator. Residential status varies in the study area. The land ownership pattern often determines social power and position. Low and habitable land ownership indicates most of the household's land property. Households almost in all the Wards own those two types of land (48%) and 30% respectively) and also a large quantity medium high land (23%) including other land area (1%).

In Ward No. 3 and 1, 57% and 50% respectively are habitable land owned by the households. In Ward No. 2, 4, 5, 6, 8 and 9 habitable land and low land ownership exists. Ward No. 3 and 7 have a combination of habitable, low and medium high land ownership. Only in the Ward No. 1, combination of low, medium, habitable and other land areas is found. Since, the area is agriculture based with considerable number of business activities, presence of considerable ownership of low land and medium high land supports agriculture and small business activities as main occupation.

Living house types that exist in the Wards are highest in Tin-shed (67.6%) and almost every house owned by the household owner. For example, in Ward No. 7 there are 48.7% Tin-shed houses among which 87% houses are owned by them, 10% houses are rented and 3% ownership goes to other type. It is notable that pucca, semi-pucca or thatched houses are 100% owned by dweller itself. There are no pucca houses in the Ward No. 1, 5, 6, 8 and 9. Other Wards have some pucca houses but very low in percentage. There is significant number of semi-pucca houses in all the Wards. Rented living house types are extremely low in percentage, which seems to imply that people in the households in this Paurashava are mostly permanent residents.

## 2.2 Economic Development

Two basic elements of economic development i.e. employment generation and increase of productivity are found in the cities and urban areas than the rural areas. This is a common phenomenon for the developed and developing countries. Employment opportunities act as a strong pull factor for influx of job seekers in the cities and urban

areas, the centers of productivity. Special features of the planning area are that it covers a vast rural area, besides a small urban center of Paurashava town. One National Highway passes on the western side of the Paurashava and both the sides of the highway is occupied by huge tracts of agriculture land and sporadic homesteads, at places showing the signs of development along with the hats, bazars indicating the dominant role of agriculture and fishery. This indicates general feature of the study area as a mixture of rural and semi-urban nature. These special socio-economic features of the planning area have been taken into consideration in conducting the study of the prevailing economic situation.

**Industry:** It has found from the field survey that 110 industries with six categories are in the planning area. Among those establishments, agro-based industries account for about 75% and other industries 25% share of the total running industries. It reflects the general agrarian character of the planning area. All of those enterprises are proprietorship units meaning that private sector dominates the industrial sector of the planning area.

Most of the industries (except chemical industry, pottery, ice cream factory, ice mill and saw mills) in the planning area depend on raw materials available within the planning area. The industrial output produces in the local market. It is also found that those establishments have problems and potentialities. Careful consideration will help to resolve those problems and adoption of necessary policy initiatives will help to flourish the existing units and draw more investors and entrepreneurs to set up new manufacturing industries, which will be based mainly on local raw materials.

**Commerce:** Commerce includes purchase and sale of various consumer and durable items performed by the business person. In the planning area, such activities are wholesale and retail trade, hotel and restaurant business, transport, storage services, hat/bazar, etc. Major part of trade and commerce of the planning area is conducted through hat/bazar where agriculture produces, consumer items, merchandise for household and other farm and non-farm items are transacted. The market/bazar performs significant role on the Paurashava economy. It is observed that market/bazar provide good number of employment and act as an economic centre for the area of influence of the market/bazar. This market/bazar remains open everyday from morning to evening. Along with the daily business transactions, two market places are also used as hat which sits twice in a week. On the hat day farmers, traders, businessmen and many other informal professionals gather in the hats and run trades and business till evening. Actually, the market/bazar is the key supplying centres of all sorts of agro-products to the urban areas and other non-producing areas of the country, and similarly this market/bazar is the major distribution centres of industrial products to the vast majority of the rural people throughout the country at consumer levels. Importance of the

market/bazar place can not be ignored, rather needs to be facilitated with provision of infrastructure facilities.

There are two locations with agglomeration of commercial activities at hat/bazar area in the Paurashava. Those hats/bazars are taking place in the core part of the Paurashava along with the road; tin-shed semi-pucca structures with parcels of open lands. Saturday, Monday and Wednesday of a week are the local Hat days. Those hat/bazars are prominent due to its availability of agro-product and fish. People from different Upazilas, Zilas and Capital City accumulate in those hat/bazars as a buyer.

The Paurashava is composed with 1315 number of shops. The scenario proves that the area is identified as a rural-based commercial centre and dominating the surrounding Upazila and Zilas with its economic commodities. Daily gross economic turnover may be taka 13 lakhs to 15 lakhs (approx. one thousand taka per shop in average).

**Services:** The service sector consists of the hotel and restaurant business; transport and communication, storage/godown, financial intermediaries, real estate, rental activities, public administration, education, health, community service and social work including social and personal services. The service sector significantly contributes to the local economy. Most of the service structures are housed in permanent structures. There are some makeshift type structures also.

There are 5 different banking establishments and 3 NGOs working throughout the planning area. Major investment by the banks are in the field of cash credit in the form of running capital and capital loan for setting up of business establishments, besides general banking facility. Some NGOs have also disbursed agricultural loan. The NGOs are rendering services in the fields of poverty alleviation programs, awareness building, health care, education, sanitation, micro-credit and training on income generating activities 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, natural calamities, health and many other fields. A good number of people special women and poverty-stricken has been getting various types of services from the NGOs for quite a long period.

**Agro-based:** In total, 110 industries are in the Paurashava and among them 53 are poultry farm, one dairy farm, 3 chemical industries, 12 potteries, 2 ice cream factory, 4 ice mill, 3 oil mill, 22 rice mill and 9 saw mills are the total industrial scenarios. The industrial activities cover 42.69 acres and 0.57% land of the study area. Local woods are being processed in the saw mills and locally produced paddy are using in the rice mills. Those industries have been established all over the Paurashava. Location of those

industries will be rearranged and grouped in some selected areas. After construction of Padma Bridge at Maowa point, number of agro-based industries will be increased.

**Table 2.3: Type of industries in the Kalkini Paurashava**

Type of agro-based industry	Number	Type of agro-based industry	Number
Asar Alo Somobai Somittee	1	Ice Mill	4
Dairy Farm	1	Oil Mill	3
Gausia Chemical industry	3	Poultry Farm	53
Hari Patil Chula Gar (Pottery)	12	Rice Mill	22
Ice cream factory	2	Saw Mill	9
		Total	110

Source: Physical feature survey, 2009.

**Agriculture:** Agriculture dominates the economy of this Paurashava. Among agricultural produces, important items besides paddy are vegetables, local fruits, sugarcane, jute and mustards. Among the agriculture products, paddy, local fruits, mustards and vegetables are consumed locally and a considerable percent (about 40%) are using by the inhabitants of adjacent Upazilas and Dhaka City. A large number of poultry farms are located in the Paurashava and most of the outputs of those poultry farms are being traded to the Dhaka City. The Paurashava is renowned for jute cultivation. A large portion of cultivated jute exports to the industries located in the Madaripur Zila.

**Employment Pattern:** In the Paurashava, population below 10 years of age is 28128. Among population of age 10 years and above, those recorded idle are 10333, looking for work 405, doing household work 8225 and employed the remaining. The employed people identified working in agriculture are 5466, industry 149, construction 229, transportation 276, business 1574, service 107 and others 1325. In the Paurashava, economically active age-group (16-57 years age-group) stands 68% of the total population.

**Table 2.4: Population 10 years and over by main activity (in number)**

Ward	Total	NW	LW	HW	Agr.	Ind.	WEG	Con.	Tran.	H&R	Bus.	Ser.	Others
1	4454	1838	133	1126	708	4	1	32	42	12	281	31	246
2	3141	990	28	1090	588	3	0	10	62	9	231	10	120
3	3813	1312	60	1151	764	9	0	85	59	1	236	9	127
4	2129	822	45	491	171	84	0	43	24	10	254	9	176
5	2774	1041	37	852	445	2	0	15	22	2	254	9	95
6	2574	821	15	875	590	38	0	5	41	0	68	4	117
7	2922	1254	43	796	498	5	0	14	10	0	93	29	180
8	3472	1379	34	915	979	1	0	23	0	0	40	2	99
9	2849	876	10	929	723	3	0	2	16	4	117	4	165
Total	28128	10333	405	8225	5466	149	1	229	276	38	1574	107	1325

Source: Population Census 2001, Community Series, Madaripur Zila, Bangladesh Bureau of Statistics, October 2006, p. 107.

Note: NW = Not Working, LW= Looking for Work, HW= Household Work, Agr.= Agriculture, Ind.= Industry, WEG= Water, electricity and gas; Con.= Construction, Tran.= Transport, H&R= Hotel and Restaurant, Bus= Business, Ser.= Service.

**Informal Economic Sector:** Informal sector covers a lot of activities which may be classified as trading and services. Various type of mobile or fixed salable items like food, fish, nuts, coconut, vegetables, daily household items, old cloth/garment, repairing of household gadgets, electronic items repairing, hair cutting, shoe polishing, etc. are considered as informal economic activities.

In the Paurashava, informal entrepreneurs mainly perform their business in the market / bazars and males are dominating this sector. Mostly 18-34 age-groups run the informal activities followed by 35-59 age-group. In total, 18 types of occupation grouped under two major categories of Trade and Services, adopted by the informal entrepreneurs in the Paurashava. Of the various occupations, trade includes sale of various food items, clothes, vegetables, meat, seed, medicines, etc. and service includes hair cutting, shoe repairing, umbrella repairing, mobile phone service, tailoring, etc. It is revealed that, major occupation is agriculture adopted by 45% (rest 5% is formal occupation), service is composed 12% and business is 12% (rest 10% is formal business) of total informal entrepreneurs. Sources of the capital of the informal entrepreneurs are inheritance (5%), self-earned (92%), borrowing from friends / family members (2%) and loan from NGOs (1%).

It has been found that, 3% (including loan from NGO) of total entrepreneurs had to borrow money to form capital for their business. Rest of the respondents did not receive any loan to start their business. Recipients of loan of the informal sector have received varied amount of loans. Of the total loan recipients, 60% took loan ranging between Tk. 5000.00 to Tk. 8000.00, followed by 27% received between Tk. 8001.00 to Tk. 12000.00 and 13% between Tk. 12001.00 to Tk. 15000.00.

About 37% respondents monthly earning is in the range of Tk. 6000 to Tk. 9000 and 33% is Tk. 4000 to Tk. 6000. Only 8% respondents are in the very low income range of less than Tk. 4000 monthly. A considerable (22%) entrepreneurs has monthly income is above Tk. 12000. Informal entrepreneurs encounter many problems like dull business, unfavourable weather, fear of eviction, extortion, lack of permanent business location, exorbitant rate of interest, lack of credit facilities and unhygienic residential areas.

Informal entrepreneurs encounter many problems like dull business, unfavourable weather, fear of eviction, extortion, lack of permanent business location, exorbitant rate of interest, lack of credit facilities and unhygienic residential areas.

## 2.3 Physical Infrastructure Development

Kalkini Paurashava is comparatively a large size Paurashava (30.30 sq. km.) than the other Paurashavas of the Madaripur Zila. There is a unique opportunity of growth of the Kalkini Paurashava. Dhaka is only 85 km. (through Maowa) away from this Paurashava.

Obviously the physical growth will be occurred towards the Madaripur and Takerhat. As it is agriculture based Paurashava, its development mainly depend on the future road pattern and urban services.

The Paurashava is oval shaped. Dhaka–Barisal via Bhanga national highway passes through the middle of the Paurashava from east to west. Location of Kalkini Paurashava is a crucial point of development through the Dhaka–Barisal Highway (through Mawa). After construction of 1st Padma Bridge, the Paurashava may be merged with the Takerhat due to its nearness. Present development of the Paurashava is followed the road ways. Such development will be changed after construction of the Padma Bridge.

Functional linkages include national highway, regional highway, primary, secondary, tertiary roads, local road, access road, feeder road, walk way, etc. This landuse includes establishments to accommodate all transport and communication facilities such as bus terminal/stoppage, railway station, toll station, ferry ghat, launch ghat, boat ghat, etc. This category covers an area of 5.18 acres of land or 0.07% of the planning area. The highest amount of road coverage is found in the Ward No. 1 (19.40 acres), next in Ward No. 3 (15.70 acres) and Ward No. 9 (14.80 acres). Ward No. 4 (7.50 acres) is the lowest position of this category. All types of transport related facilities are available in Ward No. 1, 2 and 9.

**Road:** In the Paurashava, about 50% roads are pucca (bituminous carpeted) and their total length is above 53 km encompassing an area of 44.60 acres. Total length of semi-pucca road is 3.6 km and this accounts for 3% of the total roads in the Paurashava. In total, 2.5 acres of land are being used under semi-pucca road in the Paurashava. The katcha road is called earthen road. About 47% road is katcha accounting for 51 km. coursing 27.1 acres of land. In total, there are 431 no. of roads under three category coursing 108.3 km in length and 73.30 acres of land.

No transport terminal facility exists within the Paurashava area. Buses and trucks as well as other vehicles generally park on adjacent roads. One National Highway crosses the Kalkini Paurashava towards Barisal and Madaripur. The highway produces an intersection at Kalkini bus stand. All type of vehicles stand and parks on the intersections and the bus stands. Besides this, all intersections are the places where local passengers carrying vehicles await on roads with some stoppage time.

**Waterway:** No waterway is available in the Paurashava. There are altogether 91 bridges (RCC) and 52 culverts (RCC) in the Paurashava. Those bridges and culverts are located on the major canals and drainage channels. The planning area is flood prone area. Water-logging is common, dyke is an important issue for this Paurashava, but there is no dyke or embankment in the Paurashava.

**Railway:** No railway facility is in the Paurashava.

**Airway:** No airway facility is in the Paurashava.

## 2.4 Environmental Growth

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

## 2.5 Population

According to the Census Year of 2001, total population of the Paurashava Town is 38498. But, according to the Paurashava authority, total population of the Paurashava is 46252 for the year 2010. Population density is 1385 person per sq. km.

Table-2.5 presents the scenarios of total population including male and female of the Paurashava. Total household in the Paurashava is 7897 but according to the record of the Paurashava authority, total holdings are 7733 (for the year 2010) among them government 38, commercial 400 and residential 7295.

**Table 2.5: Population according to the mouza and mahallas, 2001**

Name of the mouza and mahalla	Ward No.	Male	Female	Total
Rajdi	01	1991	1993	3984
Majidbari		443	377	820
Pangasia (part)		1811	1581	3392
Char Pangasia	02	212	216	428
Char Thengamara		820	846	1666
Dakkhin Thengamara		580	558	1138
Patabali (part)		369	401	760
Uttar Thengamara		261	273	534
Char Fatebahadur (part)	03	479	528	1007
Patabali (part)		201	200	401
Sikarmongol (part)		1418	1356	2774
Char Bibhagdi	04	569	474	1043
Char Jhautala		283	283	566
Char Krisnanagar		487	523	1010
Lamchari (part)		79	76	155
Bibhagdi	05	548	522	1070
Darichar Laxmipur (part)		140	182	322
Lamchari (part)		49	15	64
Char Sadipur		333	405	738
Uttar Krisnanagar		844	795	1639
Char Kasimpur	06	58	57	115
Char Laxmi		465	468	933
Kastagar		548	557	1105
Laxmipur Pakhira		769	758	1527
Jhautala	07	707	698	1405
Badardi (part)		119	110	229
Dakkhin Janardandi (part)		1260	1118	2378

Name of the mouza and mahalla	Ward No.	Male	Female	Total
Kasimpur	08	382	363	745
Purba Minajdi		269	293	562
Ramnagar		350	348	698
Uttar Janardandi		135	145	280
Paschim Minajdi	09	981	927	1908
Puali Madaripur		204	205	409
Dakkhin Gopalpur		347	321	668
Gopalpur (part)		568	559	1127
Total		19490	19008	38498

Source: Population Census 2001, Community Series, Madaripur Zila, BBS, October 2006, p.13.

**Population density:** In the Paurashava, average population density is 1385 persons per sq. km. according to the Population Census, 2001. Ward No. 7 seems highly population concentrated area and density of population in that Ward is 2248 persons per sq. km. Medium concentration of population are found in the Ward No. 2, 3 and 4. Population density is below than 2000 persons per sq. km. in those three Wards. Ward No. 5 is lowest in the group i.e. 939 persons per sq. km.

**Population distribution:** In total, 7897 households are living in the Paurashava according to the Population Census 2001. Highest number (1193 households) of households and population concentration is found in the Ward No. 1. Ward No. 1 and 2 are adjacent with the Ward No. 3 and second highest concentration of population is found in that Ward. Ward No. 4, 5, 6 and 7 are predominantly agriculture villages; population concentration is lower than other Wards.

**Table 2.6: Household, population and density according to the Ward, 2001**

Ward No.	Household	Population	Density per sq. km.
1	1193	5712	1414
2	938	4526	1721
3	995	5080	1875
4	516	2774	1712
5	781	3833	939
6	799	3680	1314
7	783	3889	2248
8	939	4892	1080
9	953	4112	1127
Total	7897	38498	1385

Source: Population Census 2001, Community Series, Madaripur Zila, Bangladesh Bureau of Statistics, October 2006, p.13.

Population variation among the Wards is 2700 to 5700 and household size is 5 for all the Wards in the Paurashava. Ward No. 1 and 3 are the central areas of the Paurashava Town, number of household and population is highest in those Wards but medium category of density prevails. The scenario proves that availability of land presents around all the residential developments. Expansion of roads to increase the width, construction of new missing links and new community services should not create rehabilitation problem or demolishing of construction.



## 2.6 Institutional Capacity

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

**Allocated Manpower:** Strength of the Paurashava can be assessed from its employment structure and budget. The employment structure indicate the weakness as some of the important positions are lying vacant and development control function is unattended which is demonstrated in the absence of Town Planning Division. The manpower allocated for the Kalkini Paurashava by the Government except the Mayor and nine Counselors are as follows:

**Table 2.7: Allocated manpower for Kalkini Paurashava**

Positions under Divisions	Number of employees	Positions under Divisions	Number of employees
Administration	05	Health Division	07
Secretary	01	Health Assistant	02
Head Assistant	01	Conservancy Inspector	01
Store Keeper	01	Vaccination Supervisor	01
Upper Division Clerk	01	Vaccinator	02
Lower Division Clerk	01	MLSS	01
Accounts	05	Engineering Division	11
Accountant	01	Asstt. Engineer	01
Cashier	01	Sub Asstt. Engineer (Civil)	02
MLSS	03	Sub Asstt. Engineer (Power)	01
Tax Assessment	02	Lower Division Asstt.	01
Tax Assessor	01	Work Asstt.	01
Asstt. Tax Assessor	01	Street Light Inspector	01
Tax Collection and License Division	06	Line Man	01
Tax Collector	01	Driver	01
Asstt. Tax Collector	03	Night Guard	01
License Inspector	01	Power Asstt.	01
Asstt. License Inspector	01	Total	33

Source: Local Government Ministry of Bangladesh, 2009.

**Existing Manpower:** Existing manpower except the Mayor and nine Counselors in the Kalkini Paurashava is presented in the Table-2.8. In total 19 employees as a permanent staffs are in the Kalkini Paurashava.

Among the allocated manpower (7 employees) for general administrative division, 3 employees designated as office assistant. Accordingly, 3 persons are allocated for accounts division, 5 persons for tax section, 9 persons for engineering section and 4 employees for health division. Existing scenario deserves more involvement of employees; otherwise implementation of master plan will be difficult with the help of present manpower of the Paurashava authority.

**Table 2. 8: Existing manpower of the Kalkini Paurashava (permanent)**

Name of the section	Number of employee	
	Sanctioned	Existing
1. Engineering: Executive Engineer	01	01
Water supply and sanitation	09	---
Public works, electricity and machinery	23	09
2. Administration: Secretary	01	01
General section	14	03
Accounts section	04	01
Assessment section	03	01
Tax collection and license	10	01
Urban market section	03	01
Education/culture/library	30	---
3. Health, family planning and cleaning: Health officer	---	---
Cleaning section/conservancy	03	---
Health, family planning section	17	01
Total	118	19

Source: Kalkini Paurashava, 2010.

**Logistic Support:** Logistic support and necessary equipment is limited for Kalkini Paurashava which should be a really big concern. Only a Garbage Truck and a road roller are available.

**Paurashava Office:** The Paurashava building is newly constructed in recent year. Single two-storied building with a proto-type design, designed by the PWD is using as administrative building of the Paurashava. About one acre land has been acquired for this purpose. The building is known as Paurashava Office and located by the side of Dhaka-Barisal via Madaripur. Surrounding lands are using for agriculture purposes. Further provision for extension of the Paurashava office boundary will be easier and other administrative buildings may be constructed in the Paurashava office boundary.

## 2.7 Urban Growth Area

Physical growth of Kalkini Paurashava town generally depends on the road pattern of the Paurashava. Kalkini Paurashava is connected with Dhaka road and Faridpur road. So, linear development is the common feature of the Paurashava. The Kalkini Bus Stand is another important centre, which influences the dwellers to shift towards this bus stand. Education facilities also attract the people. So, there is great scope of physical growth in Ward No. 1 towards the Dhaka road due to small business.

Settlements are formed linearly around the internal roads and the inter-district road. Pattern of compact settlement is viewed in the Ward No. 1 and 9. Those Wards are adjacent to the river and national highway respectively. Linear settlement pattern is found in all the Wards. Ward No. 3, 4, 6, 8 and 9 is mostly agriculture dominated areas. Most of the commercial activities are formed in the Ward No. 1 and 9.

Once the area developed as a trade centre based on the river communication. The traders who bring their commodities through the river the market of the Paurashava acted as a boat ghat after the unloading of commodities from the boat. From then, development activities started along the riverside. This trend has been continued up to the recent years.

After the year of 1980, when Upazila system imposed in consideration of the decentralization of administration, some internal roads have been developed and trend of development followed those roads.

After the year of 1990, development activities started sparsely due to the presence of vast low lands. But, this type of development also followed the proximity of Upazila Headquarters and market areas.

## **2.8 Catchment area**

Catchment area of the Kalkini Paurashava is calculated according to the agriculture commodities and movement of dwellers for rendering services. From Kalkini Paurashava, agriculture commodities marketed to the Madaripur, Takerhat, Gournadi of Barisal and Dhaka. Rice, jute, onion, mustard and sugarcane are the major agriculture products marketed in those areas. Except agriculture product, fish and poultry products also distributes in those areas. The Paurashava dwellers for rendering their services go to the Dhaka, Madaripur and Faridpur.

## **2.9 Landuse and Urban Services**

### **Landuse**

Existing landuses are categorized on the basis of functional activities perform in Kalkini Paurashava. In this Paurashava agriculture occupies 5218.61 acres of total land. Residential and circulation network occupy 1186.46 and 73.30 acres of land respectively. An area of 649.44 acres is covered with water bodies.

In this Paurashava, agriculture occupies about 70% of total land. Residential and water body occupied 2nd and 3rd position respectively. Except commercial, community services, water body and circulation network other activities are less than 1%. According to the landuse, agricultural domination is found in the Paurashava. All Wards are occupied large amount of agriculture land. The Wards are conceived agriculture land not

below than 255 acres. Highest amount (1050.69 acres) of agriculture land is available in the Ward No. 3 and lowest (255.42 acres) in the Ward No. 7.

**Residential:** Residential landuse includes urban housing, rural homestead, flats or apartments, mess/boardings houses and informal housing (comprising thatch, katcha and semi-pucca structures) areas. In the Paurashava, most of the residential areas are informal type means that they are not developed in a planned manner.

Residential land occupied 1186.46 acres or about 16% of the planning area. Residential category is the second major dominated landuse. As per Ward-wise statistics, Ward No. 1 occupied highest amount of land (234.31 acres) and Ward No. 4 is minimum (63.35 acres).

**Commercial:** Seven hats / bazars within the Paurashava premises are in unorganized nature. The bazars are developed naturally through generations and prominent due to their availability of agro-product and fish. People from different Upazilas and Zilas accumulate in that bazar as a buyer.

Landuse under this category are retail and wholesale shopping areas and all categories of ribbon commercial developments formed along the major roads. In the Paurashava, there are large numbers of retail shops, kitchen market, weekly hat and wholesale markets. Extent of commercial landuse depends on the size of consumers. Most of the commercial activities are agglomerated in Ward No. 4 and 1 where 24.90 acres and 24.31 acres respectively of land are using for commercial purposes. Those Wards are the core area of Kalkini Paurashava. In total 102.55 acres or 1.37% of land is using for commercial purposes.

**Table 2.9: Ward-wise landuse of Kalkini Paurashava (in acre)**

Landuse category	1	2	3	4	5	6	7	8	9	Total	
										Total	(%)
Agriculture	548.27	304.23	1050.69	343.62	867.52	459.41	255.42	872.96	516.48	5218.61	69.8
Circulation Network	13.25	7.86	12	4.31	4.92	7.5	6.68	6.13	10.66	73.3	0.98
Commercial	24.31	7.91	13.01	24.9	2.13	7.55	7.87	3.95	10.92	102.55	1.37
Community Service	11.22	6.96	11.93	2.03	5.57	9.93	6.14	15.74	8	77.52	1.04
Education and Research	11.24	4.48	6.45	4.48	4.13	3.47	2.12	1.93	3.32	41.61	0.56
Government Services	3.59	29.08					4.29		0.17	37.13	0.5
Industry	4.85	6.52	26.33	0.68		1.33	0.35	0.71	1.92	42.69	0.57
Mixed Use	4.44	1.3					0.19		1.45	7.37	0.1
Non-Government Service	6.09	0.62	1.71			3.84	2.48			14.74	0.2
Recreational Facility	1.25						0.63		0.52	2.4	0.03
Residential	234.31	145.58	108.15	63.35	87.66	114.01	129.7	161.32	142.41	1186.46	15.9
Service Activity	1.37	0.71	1.12			0.29	3.48	1.87	5.38	14.21	0.19
Transportation and Communication	0.78	0.44					1.55		2.41	5.18	0.07
Water body	119.09	56.48	92.95	41.71	55.33	66.8	48.44	69.39	99.26	649.44	8.69
Total	984.04	572.16	1324.33	485.07	1027.26	674.13	469.34	1134	802.88	7473.20	100

Source: Landuse Survey, 2010.

**Industrial:** Industries are one kind of dominating landuse. Little amount of land (42.69 acres or 0.57%) of the planning area is covered by this category of use. This category includes husking mill, brickfield, saw mill and oil mill. About 26.33 acres, 6.52 acres and 4.85 acres of land under industrial use are occupied by the Ward No. 3, 2 and 1 respectively.

The industrial landuse is not prominent in other Wards and no industrial land is occupied by the Ward No. 5.

**Public Land:** This category includes all types of government offices like DC office, Zila Parishad, Upazila Parishad, LGED, DPHE, Fisheries, Social Welfare, Statistical Bureau, Health office, etc. Total land under this category is found 11.30 acres (0.70%). The services are found in the Ward No. 1, 3, 4, 5 and 7. Among those Wards, Ward No. 4 is conceived highest (6.10 acres) land and lowest (0.8 acres) in Ward No. 3.

**Agricultural:** Agricultural landuse includes paddy field, cropland, grazing land, horticulture, orchard, etc. It constitutes 69.8% of total land of the Paurashava. The rural agricultural landuses are spread over the entire planning area. In Ward No. 3, 5 and 8 agricultural land is occupied 1050.69 acres, 867.52 acres and 872.96 acres respectively out of the total land (5218.61 acres) under this category. At the same time, Ward No. 7 and 2 are occupied 255.42 acres and 304.23 acres respectively.

**Education:** The Paurashava is moderately developed with number of educational institutions like college, high school and primary school for improvement of educational activities. The students who likes to develop him with higher education shifts to the Dhaka or Zila Headquarters, but for general educational services some educational institutions are found in the Paurashava premises. One college and six high schools are showing the minimum facilities of higher education. Twenty nine primary schools are identifying the demand of modern educational activities with roots. Number of educational institutions in the Paurashava is presented in the following table.

**Table 2.10: Number of educational institution in the Paurashava**

Type	No.	Type	No.
College	01	Girls school	01
Non-Government Secondary school	06	Kindergarten	02
Government Primary school	19	Madrasha	05
Non-government Primary school	09	Etimkhana / Orphanage	01

Source: Kalkini Paurashava, 2010.

Total area under this use is 41.61 acres or 0.56% of the Planning Area wherein Ward No. 1 and 3 accounts for 11.24 acres and 6.45 acres respectively. Ward No. 8 conceived minimum landuse under educational facilities (1.93 acres). All Wards are involved with educational establishment.

**Land under other Govt. Institutions:** Such type of land is dedicated for activities of public gathering which are mostly closed spaces. This category of use includes auditorium, town hall, all kinds of assembly hall, community centre, etc. In the Paurashava, such category constitutes 77.52 acres (1.04%) of land. Highest concentration of such services is found in the Ward No. 8, 3 and 1 (15.74, 11.93 and 11.22 acres respectively) and lowest in the Ward No. 4 (2.03 acres).

This category also includes all types of financial institutions like bank, insurance company, mercantile and cooperative society, health, fire station, police station, electric sub-station, telephone office, etc. In total, 14.21 acres (0.19%) of land is found under this category. Highest concentration of those services is found in the Ward No. 9 (5.38 acres) and lowest in the Ward No. 6 (0.29 acres). No service activity is available in the Ward No. 4 and 5.

**Khas land:** The Paurashava is not maintaining the khas land record. Upazila Nirbahi Officer is the custodian to maintain the khas land record and he has denied to supply any information on khas land of Kalkini Paurashava.

**Recreational:** Recreational facilities like cinema hall, auditorium, amusement park, picnic spot, etc. are included in this category and it covers an area of 0.20 acres land. Presence of the auditorium is located in the Ward No.4 proves that the area is historically developed in cultural activities. The auditorium also uses as community centre for different purposes. Ward No. 4 is dominating areas for recreational facilities in the Paurashava. In total, 10 clubs are found in almost all the Wards. Those clubs are the local recreational centers, sometimes also use for political purposes. Indoor recreational facilities are available in those clubs.

**Water Bodies:** This landuse is spread all over the Planning Area. Water bodies like river, pond and ditch encompass 649.44 acres or 8.69% area where 119.09 acres is in Ward No. 1, 99.26 acres in Ward No. 9 and 92.95 acres are under Ward No. 3. All Wards are involved with this category of landuse.

**Mixed-Use:** Mixed-use areas are those where, either commerce is mixed up with residence or residence with commerce or residence with office or admixture of all the three. Sometimes small industrial enterprises are also found to co-exist with any one or all the above landuses. However, other admixture of diverse landuses is also found. Mixed landuse is a common character of all unplanned urban centers in Bangladesh. The degree of such admixture depends on the specific location of the area. If the area is closer to the urban centre than the more profitable landuse takes over the less profitable ones and co-existence of diverse landuses prevail for long till one fully takes over the other. In such areas usually commerce gradually takes over residential use. In the

Planning Area, mixed-use is not prominent and acquired 7.37 acres of land (0.20%) and they are found in the Ward No. 1, 2, 7 and 9.

**Urban services:** The Paurashava is formed with the urban services like Post Office, Bank, Police Station, Monument and Mobile Tower. Highest number of those services is found in the Ward No. 1. No urban service is in the Ward No. 4, 5 and 8. The schedule bank is found in the Ward No. 1, 7 and 9. Five monuments are located in the Paurashava, each in the Ward No. 1, 2, 3, 6 and 9. In total, 20 numbers of urban services have identified in the Paurashava. Post office and police station is located in the Ward No. 1.

**Other (Abandoned, etc.):** In the Paurashava, 6 NGOs are found with multi-disciplinary social development activities. Most of those offices are located in the residential areas and same compound in a residential building. The NGOs are separated from the residential buildings and established independently. Total areas under non-government services are 14.40 acres (0.20%) and those establishments are found in the Ward No. 1, 2, 3, 6 and 7.

## **2.10 Paurashava Functional Linkage with Regional and National network**

**National:** Physical growth of Kalkini Paurashava town generally depends on the road pattern of the Paurashava. Kalkini Paurashava is connected with Dhaka road and Barisal roads. So, concentrated development is the common feature of the Paurashava. The Kalkini Bus Stand is another important centre, which influences the dwellers to shift towards this bus stand. So, there is great scope of physical growth towards the Dhaka road due to communication facilities.

The soil of the Zila is mainly formed by the very young Ganges meander flood plain and the mixed young and the older Ganges meander flood plain. The northern and eastern parts of the Zila are covered by grey silty clay of the active and very young Ganges meander flood plain. Central and southern parts of the Zila are mainly formed of brown silty clay of the mixed young and the older Ganges flood plain. Northern part of the Zila is less productive and is mainly used for Aus paddy.

The main rivers flowing through the Zila are the Padma, the Jamuna, the Garai and the Kumar. The Padma and the Jamuna are navigable throughout the year. These rivers are non-tidal. In the Zila, Kalkini is functioning as a connecting link between Dhaka to Barisal and Madaripur of southern part of the country.

Poor sanitation facilities with pit latrine and open drain, katcha latrine are the general picture of sanitation facilities. Adjacent River and low lands are using as dumping ground of solid wastes. Market areas and boat ghats are congested with commodities and garbage.

Kalkini is a new Paurashava established with a link road from National Highway. No urban facilities yet provided by the Paurashava authority. All urban facilities as a township development are necessary. Most of the urban services were developed when the Paurashava was formed as a growth centre. Inhabitants of the Paurashava make their opinion (during consultation meeting) in favour of the Paurashava formation because the Paurashava system will provide urban services and economic development.

North, south and eastern parts of the Paurashava are under the char lands. In every year the Padma River submerges and eroded those lands. Urban facilities are not possible to provide on those lands except agriculture.

Most of the areas in the Paurashava are low land needs sufficient earth filling activities (at least 2 to 9 meter) to provide urban services. As a result, heavy construction cost should be considered to provide those facilities.

**Regional:** Madaripur Sadar Upazila on the northern side of the Upazila, Barisal Zila on the south, Gopalganj Zila on the east and Shariatpur Zila on the western part of the Kalkini Upazila. Regional importance of the Kalkini Paurashava as well as Kalkini Upazila is governed with its agriculture production. Rice, jute and sugarcane are the major agriculture production. Most of those productions distributes among the Upazilas and Zila lying at the boundary line of the Kalkini Upazila.

## 2.11 Role of Agencies for Different Sectoral Activities

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

**Table 2.11: Agencies responsible for sectoral activities**

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

Source: Physical Feature Survey, 2009.

The authorities (as presented in the Table-2.11) should perform other roles need to be carried out with the assistance and support of other relevant government agencies. Those roles are:



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

**Map 2.1: National/ Regional Road Network**



## CHAPTER 3

### 3. PROJECTION OF FUTURE GROWTH BY 2031

#### 3.1 Introduction

The Chapter presents future growth of the Paurashava according to the population, economy and landuse. The projected period for those components has been considered for the year 2011 to 2031. In case of population and landuse, projection has been presented but in case of economy, opportunities have been considered. For the Kalkini Paurashava, government policy is the prime focus as economic opportunity but that is not considered here. Existing local economic strength considers as the basis of economic opportunity. Agriculture, fish, livestock and poultry, local fruits and availability of labour force considers as a basic components of the economic opportunities.

#### 3.2 Projection of Population

In the Paurashava, from the year 1974-1981, annual growth rate of population was 1.71%, but from the year 1981-1991 the rate decreases and falls in to 0.9%. After the year 1997 when government notified the area as Paurashava, the growth rate decreases and it was 0.83% during the year 1991-2001. If, 0.83% annual growth rate consider, the population will be increased according to the Table-3.2.

**Table 3.1: Population growth trend analysis**

Year	Growth rate (Decadal)	Growth rate (Annual)
1974-1981	17.1	1.71
1981-1991	9.0	0.90
1991-2001	8.3	0.83
2001-2011	7.7	0.77
2011-2021	7.7	0.77
2021-2031	7.7	0.77

Source: BBS 2011 and calculated by the Consultant.

**Basis of population projection:** There is no data in census 1991 according to the Ward of Kalkini Paurashava. According to the BBS, 2001, urban population growth rate is 20.86. It is absurd for an agriculture-based township. Again, the population growth rate consider in the Table-3.2 is too minimum for a flourishing urban area in a planned manner. Therefore, the population growth rate of 1974–1981 is appropriate for population projection of an agro-based township, which is 1.71% per annum. The formula quoted in calculation of the population projection is -

$$F = A (1+r)^n$$

F=Projected population

A=Current population

R=Growth Rate

N=Year

With the consideration of 1.71% population growth rate, the projection shows that the population of the planning area will be 43231 in 2016, 44917 in 2021, 46668 in 2026 and 48449 in 2031. The scenario proves that in next 20 years a considerable number of the Paurashava population will be increased. The projection is showing normal increase of population. In special case, for construction of Padma Bridge at Maowa Point, government policy on relocation of industries from Dhaka City and community facilities provided by the Paurashava according to the Master Plan, the growth rate will be increased rather than the present normal rate.

**Table 3.2: Population projection (considered 0.77% annual growth rate)**

Ward No.	Area in acre	Population 2001	Population 2011	Projected population			
				2016	2021	2026	2031
1	984.04	5712	6616	6874	7142	7421	7710
2	572.16	4526	5054	5251	5456	5669	5890
3	1324.33	5080	6051	6287	6532	6787	7052
4	485.07	2774	3091	3212	3337	3467	3602
5	1027.26	3833	4161	4323	4492	4667	4849
6	674.13	3680	3544	3682	3826	3975	4130
7	469.34	3889	3929	4082	4241	4407	4579
8	1134	4892	4918	5110	5309	5516	5731
9	802.88	4112	4244	4410	4581	4760	4946
Total	7473.2	38498	41608	43231	44917	46668	48489

Source: BBS 2011 and calculated by the Consultant.

### 3.3 Identification of Future Economic Opportunities

Most of the entrepreneurs expressed their desire of implementing future development plan. A major portion mentioned that their development plan is the expansion of their enterprises (60%) and others intend to increase their production (40%). Expansion of existing industries and establishment of new industries will create more jobs and thus have multiplier effect in the overall economy leading to create more consumption capacity, investment opportunities in diversified economic fields and thus push the economy upward.

Some small-scale pisciculture is located in the Kalkini Paurashava area. About 58 households are involved with such pisciculture. The production mostly uses in the Dhaka City and Madaripur Zila. Investment in this field will bring huge prospects of the Paurashava. Other economic prospect summarizes in the following discussions:

- Availability of agriculture land. The land may be used for different agricultural production and those productions may be used for the input of agro-based industries.
- Availability of unskilled and cheap manpower.

- Due to the nearness of Dhaka City, the Paurashava may be developed as the fringe area of Dhaka City. This fringe area with its agriculture production will support to the Dhaka City where marketing for those productions are available.
- The Paurashava has been developed as growth centre concept. Some cluster development is found around this growth centre. Planned development through this master plan will initiate to arrange the growth component in a systematic manner. At the sametime, economic development parallel to the physical and social development will be encouraged.

Housing areas in the Paurashava is the composition of an admixer of housing types. Mixed residential, poor dominated rural houses and semi-urban homesteads are found. Most housing areas have developed in a spontaneous fashion. In the rural part of the Paurashava, with its rural-agricultural character, has a different housing type. The dwellings, comprising homesteads, encompass larger areas having low-density. The highest gross population density in the Paurashava is only 5 persons per acre. Buildings in the Paurashava are dominated by katcha structure (99%). No building is found approved from Paurashava. However, owners of the buildings have been found violated the setback rule by the construction. Except labour charge there is very little variation in building construction cost between Dhaka and Kalkini Paurashava.

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 squatting in public land. They are not only deprived of minimum housing but also from the personal security that endanger their health and working efficiency. Regular income can solve most of their housing problems. Apart from dwelling, pure water and transportation are real problems for the inhabitants. Municipal services are highly inadequate. Drainage is major problem in rural part of the Paurashava. The Paurashava can not solve the problems due to scarcity of fund. In the Paurashava, above 99 percent housing structures are one-storied that includes semi-pucca, katcha and Jhupri type houses.

**Basis of housing projection:** Existing landuse is not the only basis for housing projection. Residential use has considered for the year 2010 as base year and projected housing area is calculated considering 40 persons per acre (at present 5 persons per acre).

**Table 3.3: Ward-wise demand of housing areas (in acre)**

Ward No.	Existing Housing Area (acre), 2010	Estimated housing demand (acre)			
		2016	2021	2026	2031
1	234.31	172	179	186	193
2	145.58	131	136	142	147
3	108.15	157	163	170	176
4	63.35	80	83	87	90
5	87.66	108	112	117	121
6	114.01	92	96	99	103
7	129.70	102	106	110	114

Ward No.	Existing Housing Area (acre), 2010	Estimated housing demand (acre)			
		2016	2021	2026	2031
8	161.32	128	133	138	143
9	142.41	110	115	119	124
Total	1186.46	1081	1123	1167	1212

Source: Landuse Survey, 2010 and calculated by the Consultant.

**Demand analysis:** It is estimated that housing demand stands at 1212 acres at the end of project period 2031. The estimate is based on the assumption that the standard supplied by the LGED for housing estimation where density is declared around 100 or 150 per acre. The Paurashava is developing rapidly and in future the trend will continue. Though the Paurashava is agro-based, horizontal development is taking part rather than the vertical expansion. By considering these facts, the density in this Paurashava is considered 40 persons per acre.

# CHAPTER 4

## 4. DEVELOPMENT PROBLEMS OF THE PAURASHAVA

### 4.1 Physical Infrastructure

- Most of the lands in the Paurashava are acting an important role on the supply of agriculture commodities in different Paurashavas and Zilas. All of those lands submerge in rainy season. On the other hand, development activities are reducing agriculture land rapidly. This trend should be controlled through the imposition of development control, but the contemporary regulations and their management is not enough to control such development activities.
- About 5 to 9 meter earth filling will be needed for every development activities in the Paurashava. So, bulk development should not be encouraged due to the huge cost involvement. Poor soil condition is another problem of bulk development. Lowlands are also providing natural drainage facilities in the area.
- The Paurashava is a naturally developed area. Planning effort yet not been taken by the public authority. Therefore, a mixed landuse scenario is viewed all over the Paurashava. These unorganized landuses should be framed within a planning manner with the physical and financial involvement of public authority.
- All roads in the Paurashava town are narrow and irregular. Some of the roads submerge in rainy season. Widths of all semi-pucca and katcha roads are between 3 to 6 meters and somewhere they are using as footway. Those narrow and irregular roads may be widen and in regular shaped but not in all cases. Because some of the roads are in densely populated areas, pucca buildings and commercial establishments will be needed to demolish. Some roads did not preserve any scope for further improvement. Infrastructural facilities such as water and sanitation will not be possible to construct in those narrow roads.
- Southern part of the Paurashava is under the char lands. In every year the Arialkha and Palardi Rivers submerges and eroded those lands. Urban facilities are not possible to provide on those lands except agriculture.
- Most of the areas in the Paurashava are low land needs sufficient earth filling activities (at least 1 to 10 meter) to provide urban services will be needed. As a result, heavy construction cost should be considered to provide those facilities.
- Problems will be prevailed to provide central water supply and drainage system due to the presence of ditches and char lands (sandy soil, eroded every year), only the land along with the National Highway (Dhaka-Barisal) appropriate for those services.

### 4.2 Socio-economic

The Paurashava is quite poor in respect of basic utility services. Information collected through Socio-economic survey reveals basic utility facilities like piped water supply is



very negligible. Gas, drainage and sewerage and solid waste are also in same condition. People use various types of fuel sources like cylinder gas, kerosene, wood, electric heater, cow dung, etc. For drinking water supply, deep tubewell, community tubewell uses, electricity supply for household lighting and for other purposes exists but with frequent load shedding.

Almost all the Wards are connected with electricity supply in moderate level. In spite of this, considerable number of households in all the Wards has no electricity facilities. Almost all the Wards have no sewerage system and toilets are mostly consists of sock pits. Overall garbage disposal system is poor. Garbage Dumping Ground is not available and mostly disposes on open streets. Wastes collect by the NGOs but not well organized all over the study area.

Kalkini Paurashava bears rural influences and agriculture is the major source of income. Average monthly income per household is Tk. 10415. Food relatively stands higher in expenditure list (Tk. 6700 in Paurashava as a whole). The residents of the Paurashava can save a considerable amount of money per month from their income (highest amount is Tk.1921).

**Drainage Facility:** Nearly non-existence, very shallow katcha in type is the major characteristics of drainage facilities in the Paurashava. There are katcha drains constructed along the access roads, but this is found rare. Those drains are not continuous and open and not facilitated all the Wards.

In total, 5.35 km. roadside pucca drain is found in the Kalkini Paurashava constructed by personal initiative. Those drains are uncovered and located in the Ward No. 1, 2, 3 and 7. Average width of those drains is 0.46 m. The drainage system in the study area is to be improved in future by proper drainage network plan.

**Sewerage Facility:** Sewerage system is very important component from the environmental point of view. Almost all the area of the Paurashava is devoid of sewerage facilities. There exists a minor process of development in certain selected Wards but limited to government quarter only. Regarding ownership of toilets it varies widely in most of the Paurashava area. Most of the households have their own toilets.

**Toilet Facility:** Toilet system of the planning area is mostly categorized as kutchha. In spite of this, Paurashava has a modest development of pucca toilets in government zones. Sewerage system has not been introduced on a trial basis as to their popularity and acceptance. Ownership of toilets varies widely in most of the planning areas. Most of the households have their own toilets and at the same time there is joint toilets found in slum areas. Sanitary toilets are comparatively poor in most of the Wards.

Most of the household owner build individual septic tanks for disposal of night soil and built on own initiatives. Among the total holdings, 569 have sanitary (7.21%), 6781 have unsanitary (85.87%) and the rest 547 (6.92%) have no latrines. No latrine is connected to the drain.

**Water supply:** All households are using hand tubewells as main source of drinking water and cooking purposes. Only 4.0 buildings are using water reservoir to maintain their daily needs. About 88% of the residents are using river and pond water for washing and bathing purposes. In the Paurashava, about 7500 hand tubewells are available. From a study made by Department of Public Health Engineering (DPHE) in 2007, 77% of the total tubewells are contaminated by arsenic. Ground water level during dry and wet seasons are 16ft and 3.5 ft respectively. In the Paurashava, 3 deep tubewells / pump houses with 14 km water supply line is found. In total, 404 households are linked with water supply line.

Hand tubewell and ponds as water sources exists in most of the Wards of the Kalkini Paurashava. Ownership of hand tubewell mostly goes to neighbour's property (58%) and own property (36%). This scenario is found in almost all the Wards. Some residents of Ward No. 1, 2, 4, 5 and 8 are enjoying water source from Paurashava supply. People of all the Wards in the Paurashava use pond (68%) as a secondary source of water.

#### 4.3 Environmental

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

However, implementation of activities like roads, drainage, bridge/culverts, housing and industrial establishments and bazars will radically change the natural topography and landuse pattern. The agricultural land will be converted into urban and semi-urban nature. Existing scenic beauty will disappear; water bodies will lost and general slope will be diminished for earth filling due to urbanization. Therefore, in the process of preparation Structure Plan, Urban Area Plan and Ward Action Plan, consideration of those factors will be made for keeping the natural environment livable.

To create a better living environment, environmental phenomenon (as discussed earlier) has been considered with the systematic planning principles and regulatory measures.

With these views, people's awareness needed to be increased through different public activities about the fair living environment. Arrangement of land uses should be provisioned for all the public and private organizations as their necessities.

## CHAPTER 5

### 5. PAURASHAVA DEVELOPMENT RELATED POLICIES, LAWS AND REGULATIONS

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

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

#### Urban Land Management Policy

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

#### Policies

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

- Implementation of land-banking and land-pooling programs that allow the government to increase its pool of land which can be exchanged for low-cost housing sites in the Paurashava;
- Undertaking land readjustment projects that include low-cost land and housing sites.
- Undertaking land-sharing schemes and tenancy reforms for establishing clear rights of tenants.
- Allocating khas land/acquired land for housing the poor.
- Allocating reasonable proportion of land in urban places for housing the poor.

### **Strategies**

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

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

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

### **Landuse Policy**

Bangladesh Landuse Policy was prepared and notified in the year 2001. Major aim of the policy is to prevent indiscriminate conversion of agricultural land in to non-agricultural use, because such conversion may be threatened for food security of the country. The expansion of residential, commercial, industrial and socio-economic uses will encourage

the diminishing trend of agriculture land. Through the policy, government has encouraged Compact Township and vertical expansion of the different type of building rather than horizontal expansion.

## **Objectives**

The objectives of the Landuse Policy are to:

- Prohibit the recent practice on conversion of agriculture land into non-agricultural use to ensure food security for the people.
- Impose zoning provision to control the better use of land according to the nature of land located in different regions.
- Rehabilitation of landless people on the alluvion lands alluviated from river, Haor or sea.
- Preserve khas land for future physical development activities.
- Confirm landuses in relation with the existing natural environment.
- Use of land in favour of job creation, landlessness and poverty alleviation.
- Control land pollution.
- Construction of multi-storied building with accommodation of various purposes in public and private sector for ensuring minimum land coverage.

About 70% land of the Kalkini Paurashava is under the agricultural practices. According to the Landuse Policy, those lands should be preserved as agriculture land. For such preservation, some guidelines prescribed in the Landuse Policy will be considered they are – in case of rehabilitation of the landless people, Khas land will be emphasized for distribution by the government.

## **Housing Policy**

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

The housing problem in the country is of serious magnitude. In addition to the large number of homeless households; the rapid growth of slums and unauthorized squatter settlement; the increasing cost of land and construction materials; rampant speculation and the phenomenal increase in house rent, the problem is compounded by non-availability of basic civic services, including water and sanitation to the bulk of the

population and acute shortage of affordable and adequate shelter for the poor and vulnerable groups. The housing shortage was estimated in 1991 to be about 3.10 million units, composed of 2.15 million units in rural areas and 0.95 million units in urban areas; with the bulk of the backlog consisting of katcha un-serviced units. The housing shortage is likely to exceed 5 million units by the year 2000 A.D. The current housing stock is deteriorating fast due to aging, general neglect, poverty and civic apathy on the part of the dwellers.

## **Objectives**

The objectives of the National Housing Policy are to:

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

## **Rural Homestead**

Clause 5.9 of the Housing Policy describes about the rural housing. The Kalkini Paurashava is rural based urban area. Rural character is the dominating issue in the

housing sector. In the Housing Policy, following measures are suggested to improve rural housing:

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

### **Slums and Squatter Settlements**

Clause 5.10 of the Housing Policy describes about the slums and squatter settlements. The poor environmental condition in slums and squatter settlements create health problems for their residents and those in the adjoining areas. Those areas may be Paurashava Town. Keeping in view the policies of planned growth of urbanization, income support and poverty alleviation and together with steps to arrest the growth of new slums in urban areas, the Government would take steps to:

- Encourage in-situ upgradation, slum renovation and progressive housing development with conferment of occupancy rights, wherever feasible, and to undertake relocation of the squatter settlements from the sites that need to be cleared in public interest.
- Expand provision of water supply, sanitation and other basic services in slum and other settlements occupied by the poor.



- Ensure proper maintenance of amenities in slums and squatter settlements through community involvement and decentralized institutional arrangements.
- Integrate the provision of physical amenities slums and squatter settlements with basic services including maternal and child welfare services and health care, structured on community participation and involvement of voluntary agencies and management by local bodies.
- Provide night shelters and pay and use public toilet for the footpath dwellers and the homeless.

### **Infrastructure**

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

- Increase investment by national and local government agencies in order to meet the rapidly growing needs of serviced land and to improve the availability of services in different settlements.
- Promote a balanced pattern of urbanization through a policy of decentralization of investments and incentives for the growth of secondary, intermediate and small towns so as to reduce pressure on metropolitan cities and to control unregulated conversion of agricultural and forest land for the purpose of housing.
- Develop economically buoyant and socially attractive secondary and intermediate towns by strengthening their linkages with contiguous rural areas and market centres as part of the integrated and planned development of the region and to reduce migration to the larger cities.
- Make necessary investments to increase within a reasonable time, the coverage of entire rural and urban population for potable water supply and basic sanitation.
- Increase investments in public transport and traffic network to improve mobility of people, particularly that of the poor.
- Encourage the use of infrastructure construction technologies, which are cost effective, incrementally upgradable and environmentally appropriate.
- Provide government support for extension of infrastructure based on the participation of the people and private developers, NGOs, CBOs or on innovative systems of infrastructure leasing.
- Provide Government assistance to the local bodies for adequate cost recovery of investment on infrastructure, proper maintenance of services and upgradation of the capability of the personnel in local bodies and functional agencies.

- Provide opportunity for community participation and recognize people's initiative in the design, installation and the upkeep of services within the framework of the development programmes.

## **Strategies**

The salient features of the housing strategy are:

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

## **Population Policy, 2004**

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

## **Aims**

Aims of the Population Policy as presented are:

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

## **Agriculture Policy**

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

## **Aims**

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

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

## **Transportation Policy**

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

## Summary of Issues Covered

Following tasks of a road projects will be adopted:

- The Committee reviewed the design standards for the Union, Upazila, Zila Roads, and concluded that the key design criteria for all roads should be traffic and axle loads, and not the classification of the roads.
- The six design standards agreed by the Committee to form a logical progression in terms of road width and pavement thickness, all based on traffic considerations. They are not directly related to road classification.
- The agreed design standards are to be used by all road agencies. Road agencies will be required to use appropriate standards for roads according to traffic criteria.
- Reconstruction- full pavement reconstruction on an existing embankment
- New road Construction - completely new embankment and road pavement, including bridges, culverts and any necessary slope protection. This is likely to prove a rare category of road project in Bangladesh
- Widening- road widening and upgrading, including full re-construction of the existing pavement
- Strengthening- removing existing road surfacing and providing a new base layer of Base Type-1 and surfacing.

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

**Table 5.1: Passenger Car Unit (pcu) Conversion factors for non-urban roads**

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

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

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

**Table 5.2: Design applications**

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

\* Special type to be used under special circumstances.

**Table 5.3: Existing and Recommended design lives**

Road Class	Existing Design			Recommended Design		
	Cumulative Million ESA's	Typical Expected Design Life (Years)	New Class	Design Type	Design Life (Million ESA's)	Expected Design Life (years)
Rural Road/ union Road	0.5	10	Union	8	1.0	10
				7	1.0	10
Feeder Road B/ Upazila Road	1.0	10	Upazila	6	1.0	10
				5	1.6	10
Feeder Road A/ Zila Road	1.0	10	Zila	4*	2.0	10
				5	1.6	10
				4	5.0	20
				3	6.5	20

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

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

### Environment Policy

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

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

### Proposed Sectors

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

## Strategies

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

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

**Industry:** The industries identified by the Directorate of Environment in the group of polluting industries, measures should be taken against them as early as possible. The strategy should be imposed by the Agriculture Ministry, Directorate of Forest, Commerce Ministry, Controller of Export Import, Plant Protection Wing, Directorate of Agriculture Extension, Bangladesh Sugar and Food Industries Corporation.

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

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

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

## Industrial Policy

At first, in the year 1999, government of Bangladesh has approved and notified the Industrial Policy. Again, in the year 2005, Industrial Policy of Bangladesh was published by

the government. Both the Policies are synonyms and foremost objective is to setup planned industries considering the domestic demand, prospect of exporting goods and discouraging unplanned industrial growth in the light of past experience.

## **Objectives**

Objective of Industrial Policy is:—

- To expand the production base of the economy by accelerating the level of industrial investment.
- To promote the private sector to lead the growth of industrial production and investment.
- To focus the role of the government as a facilitator in creating an enabling environment for expanding private investment.
- To permit public undertaking only in those industrial activities where public sector involvement is essential to facilitate the growth of the private sector and / or where there are overriding social concerns to be accommodated.
- To attract foreign direct investment in both export and domestic market-oriented industries to make up for the deficient domestic investment resources and to acquire evolving technology and gain access to export markets.
- To ensure rapid growth of industrial employment by encouraging investment in labour intensive manufacturing industries including investment in efficient small and cottage industries.
- To generate female employment in higher skill categories through special emphasis on skill development.
- To raise industrial productivity and to move progressively to higher value added products through skill and technology up gradation.
- To enhance operational efficiency in all remaining public manufacturing enterprises through appropriate management restructuring and pursuit of market-oriented policies.
- To diversify and rapidly increase export of manufactures.

## **Strategies**

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

- There will be no discrimination between domestic and foreign investment. Due emphasis will be given to promotion of regional and sub-regional cooperation.



- Existing public sector enterprises will be progressively privatized and public industrial investment will be limited to only those cases where there is special need to complement private investment or where there is an overriding social and national objective to be achieved.
- The capital market will be developed and strengthened to mobilize domestic savings and to attract foreign investment.
- Development of the infrastructure including port facilities, energy, transport and communication and human resource development will receive high priority Private investment including "Build, Operate and Own" (BOO) and "Build Operate and Transfer" (BOT) methods will be particularly encouraged in these sectors.
- Intensive industrial zones development will be undertaken together with balanced geographical dispersal of the zones in areas with growing potential to the utilization of local resources as more infrastructural and other facilities are put in place.
- Consistent with the charter of World Trade Organization (WTO), protection to domestic industries from external competition will be rationalized.
- To retain the competitive edge of domestic products, wage increases will be linked to productivity trends, and appropriate labour laws will be put in place to ensure congenial industrial relations.
- The industrial investment will be encouraged through tariff rationalization and (appropriate fiscal measures. The import and export policies will also be made supportive of and consistent with the Industrial Policy.

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

### **Health Policy**

National Health Policy was approved and published by the government in the year 2000.

Aim of the Health Policy is –

- To develop a system to ensure easy and availability of health services for the people living in urban and rural areas.
- To ensure optimum quality, acceptance and availability of primary health care including government medical services at the Upazila and Union level.

- To adopt satisfactory measures for ensuring improved maternal and child health at the Union level and install facilities for safe child delivery in each village.
- To improve overall reproductive health resources and services.
- To ensure the presence of full-time doctors, nurses and other officers / staffs, provide and maintain necessary equipment and supplies at each of the Upazila Health Complexes and Union Health and Family Welfare Centres.
- To formulate specific policies for medical colleges and private clinics, and to introduce appropriate laws and regulations for the control and management of such institutions including maintenance of service quality.
- To explore ways to make the family planning program more acceptable, easily available and effective among the extremely poor and low-income communities.
- To arrange special health services for mentally retarded, physical disabled and for elderly population.

### **Strategies**

Some of the strategies of health policy are:

- The aim “health for all” will be implemented through awareness building strategies. Cost-effective procedures to deliver health services will be the prime consideration.
- A specific organization will perform responsibility for Epidemiological Surveillance to control the spread of epidemic diseases. Such concept will be included with different programs.
- The services delivering by the health centers to the patient should be standard and a printed guideline on standard, monitoring and evaluation will be given to those health centers.
- A Health Services Reforms Body will be formed based on the Health and Population Sector Strategy. This Body will be responsible for infrastructural reformation, employment, development planning and implementation of human resources relevant with the health activities and development of carrier of workforces.

### **National Urban Policy**

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

- Ensure regionally balanced urbanization through diffused development and hierarchically structured urban system.

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

### **Rural Development Policy**

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

- Food for Works Program (Lj-Sl øhøej-u MjcÉ LjÑp\$Q£)
- G.R Program (Gratuitous Relief Program)
- T.R Program (Test Relief Program)
- V.G.D Program (Vulnerable Group Development Program)
- V.G.F Program (Vulnerable Group Feeding Program)
- Single-House Single-Farm Program (HLøV hjs£ HLøV Mijjl LjÑp\$Q£)

- Back to home Program (O-l @glj LjÑp\$Q£)
- Food for Education Program (Mj-cÉl øhøej-u ønrj LjÑp\$Q£)
- Rural Occupational Project (fõ£ S£øhLjue fËLÒf)
- Poverty Reduction Project (cjølå øh-jjQe fËLÒf)
- Self-employment Program for Women (jøqmj-cl BaË-LjÑpwøqje fËLÒf)
- Women Empowerment Program (jçqmj-cl pijj çSL rjaue fËLÒf)
- Coordinated Women Development Program (pjøeÄa jçqmj Eæue fËLÒf)
- Peace Home Program (njøç¹ øehjp LjÑp\$Q£)
- Shelter Support Program (BnËue LjÑp\$Q£)
- Educational Allowance Program (ønrj Efhªøš LjkÑH²j)
- Aged-allowance Program (huøLija; LjkÑH²j)
- Micro-credit Program (r¥âGZ LjÑp\$Q£)
- Allowances for Widowed, Poor and Husband-renouncement Women Program (çhdhj, cæxøq J üjj£ ølaÉJ²j jçqmj-cl SeÉ ija; fËcje LjÑp\$Q£)

### **Aims and objectives**

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

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

## Programs

Programs for the rural development may be framed on Involvement of people with the decision-making and development activities, Poverty reduction, Rural infrastructural development, Agro-based rural economy, Rural educational system, Village health service and development of foodstuffs, Village population control, Development of village settlement, Land use and development, Village industrial expansion, Increase of capital and financing, Women empowerment, Development of village child and youth, Development of village backward population, Area-based special development program, Self-employment for self-dependent, Cooperative system for rural development and Conservation of rural environment.

## 5.2 Laws and Regulations Related to-

### 5.2.1 Urban Development Control

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

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

- 1z A;çbÑL fËçaùje A;Ce, 1993 (1993 p-el 27 ew A;Ce)
- 2z AbÑ GZ A;çima A;Ce, 2003 (2003 p-el 8ew A;Ce)
- 3z ÙÛje£u pL;l Lçjne AdÉj-cn, 2008
- 4z h;jwmj-cn nËj A;Ce, 2006 (2006 p-el 42 ew A;Ce)
- 5z Cantonments Act, 1924 (Act No. II of 1924)
- 6z District Act, 1836 (Act No. I of 1836)
- 7z The Penal Code, 1890 (Act No. XLV of 1890);
- 8z Prevention of Corruption Act, 1947 (Act No. II of 1947)
- 9z hÉjwL ®LjÇfje£ A;Ce, 1991 (1991 p-el 14 ew A;Ce)
- 10z The Bangladesh Shilpa Rin Sangstha Order, 1972 (P.O. No. 128 of 1972)
- 11z The Bangladesh Shilpa Bank Order, 1972 (P.O. No. 129 of 1972)

- 12z The Bangladesh House Building Finance Corporation Order, 1973 (P.O. No. 17 of 1973)
- 13z The Bangladesh Krishi Bank Order, 1973 (P.O. No. 27 of 1973)
- 14z The Investment Corporation of Bangladesh Act, 1976 (Act No. XL of 1976)
- 15z The Rajshahi Krishi Unnayan Bank Act, 1986 (Act No. LV III of 1986)
- 16z @LjÇfje£ A;Ce, 1994 (1994 p-el 18 ew A;Ce)
- 17z Local Government (Paurashava) Act, 2009 (Act No. XLXVIII of 2009)
- 18z SeÈ J jªaÉ ¢ehåe A;Ce, 2004 (2004 p-el 29 ew A;Ce) (see section 53(2)(Q))
- 19z Evidence Act, 1872 (Act No. I of 1872) (see section 131)
- 20z fö @ljN A;Ce, 2005

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

### **Building Construction Rules, 1996**

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

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

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

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

### **National Reservoir Protection Act, 2000**

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

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

### **Acquisition and Requisition of Immovable Property Act, 1982**

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

### **Conservation of Environment Act, 1995**

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

for violation of any order presented in the Act may be 5 years imprisonment or fine with Tk. 1, 00, 000 or with both.

### **Rural Electrification Board Act, 1977**

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

- a) To establish electricity generation transmission, transformation and distribution systems in the rural areas of Bangladesh.
- b) To take measures for effective use of electricity to foster rural development with special emphasis on increase of use of electric power for economic pursuits such as development of agriculture and establishment of rural industries and assisting the advantaged sections of the community for augmenting their income and standard of living.

### **Public Health (Emergency Provisions) Act, 1944**

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

### **Brick Burning (Control) Act, 1989**

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

### **Land Development for Private Housing Project Act, 2004**

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



the Master Plan (Structure Plan, Urban Area Plan and Ward Action Plan) is being prepared.

### 5.2.2 Paurashava Development Management

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

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

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

**Table 5.4: Functions in brief prescribed in the Local Government (Paurashava) Act, 2009**

Major activity	Specific functions	Functions in brief
Town planning	Master plan	The Paurashava shall draw up a master plan for the city which shall provide for a survey of the Paurashava including its history, statistics, public services and other prescribed particulars. Development, expansion and improvement of any area within the city; and restrictions; regulation and prohibitions to be imposed

Major activity	Specific functions	Functions in brief
		with regard to the development of sites, and the erection and re-erection of buildings within the Paurashava.
	Site development schemes	Where a master plan has been drawn up and approved by the government, no owner of lands exceeding such area as may be specified in this behalf in the master plan, shall develop the site or erect a building or any plot of land covered by the provisions of a site development scheme sanctioned to area in the prescribed manner. Among other matters, a site development scheme may provide for- a) the division of the site into plots; b) the street, drains and open spaces to be provided; c) the land to be reserved for public purposes and to be transferred to the Paurashava; d) the land to be acquired by the Paurashava; 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 Paurashava may by notice require the owner of such area or the person who has contravened the provisions to make such alteration in the site may be specified in the notice as where such alteration is not made or for any reason cannot be carried out, the Paurashava may, in the prescribed manner require and enforce the demolition of the offending structure; and notwithstanding anything to the contrary contained in any law, no compensation shall be payable for such demolition.
Building construction	Building construction and re-construction	Without approval of the building site and plan by the Paurashava, nobody can construct, re-construct any building in the Paurashava area. The Paurashava will approve the plan within sixty days or refund it within that specified time frame; otherwise the plan will be considered as approved.
	Completion of construction and change, etc.	After completion of the approved building, the owner will notify to the Paurashava within 15 days. The Paurashava may inspect the building and if found any violation of the provision prescribed in the Master Plan or in the Site Development Scheme, the Paurashava may demolish the building and the demolishing cost may be incurred from the building owner.

Major activity	Specific functions	Functions in brief
	Building control	<p>If any building or anything fixed thereon, be deemed by the Paurashava to be in a ruinous state or likely to fall or in any way dangerous to any inhabitant of such building or any neighboring building or to any occupier thereof or to passers-by, the Paurashava may 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 Paurashava may take the necessary steps itself and the cost incurred thereon by the Paurashava shall be deemed to be a tax levied on the owner or occupier of the building.</p> <p>If a building is in dangerous condition, or otherwise unfit for human habitation, the Paurashava may prohibit the occupation of such building till it has been suitable repaired to the satisfaction of the Paurashava.</p>
Development	Development plans	<p>The Paurashava shall prepare and implement development plans for specific time. Such Plans shall provide for-</p> <ol style="list-style-type: none"> <li>the promotion, improvement and development of such function or functions of the Paurashava as may be specified;</li> <li>the manner in which the plans shall be financed, executed, implemented and supervised;</li> <li>the agency through which the plans shall be executed and implemented; and</li> <li>such other matters as may be necessary.</li> </ol>
	Community Development Projects	The Paurashava may, sponsor or promote community development projects for the Paurashava or any part thereof and may in this behalf perform such functions as may be prescribed.
	Commercial schemes	The Paurashava may, with the previous sanction of the Government, promote, administer, execute and implement schemes for undertaking any commercial or business enterprise.
Street	Public streets	The Paurashava shall provide and maintain such public street and other means of public commutation as may be necessary for the comfort and convenience of the inhabitants of the Paurashava and of the visitors thereto.
	Streets	No new street shall be laid out except with the previous sanction of the Paurashava. The Paurashava may by notice required that any street may be paved, metalled, drained, channeled, improved or lighted in such manner as may be specified in the notice, and in the event of default, the Paurashava may have the necessary work done through its agency, and the cost incurred thereon

Major activity	Specific functions	Functions in brief
		by the Paurashava shall be deemed to be a tax levied on the person concerned.
	General provisions about streets	The Paurashava may assign names to streets and paint the names or fix the nameplates on or at conspicuous places at or near the end corner or entrance of the street. No person shall destroy, deface or in any way injure any street, name or name plate, or without the previous permission of the Paurashava, remove the same.
	Street lighting	The Paurashava shall take such measures as may be necessary for the proper lighting of the public streets and other public places vesting in the Paurashava.
	Street watering	The Paurashava shall take such measures as may be necessary for the watering of public streets for the comfort and convenience of the public, and for this purpose, maintain such vehicles, staff and other apparatus necessary.
	Traffic control	The Paurashava shall make such arrangements for the control and regulation of traffic necessary to prevent danger and ensure the safety, convenience and comfort of the public.
	Public vehicles	No person shall keep or let for hire or drive or propel within the limits of the Paurashava any public vehicle other than a motor vehicle except under a license granted by the Paurashava, and in conformity with the conditions of such license. No horse or other animal shall be used for drawing a public vehicle within the limits of the Paurashava except under a license granted by the Paurashava.
Water supply and drainage		
	Water supply	The Paurashava may provide supply of wholesome water sufficient for public and private purposes. Frame and execute water supply scheme for the construction and maintenance of such works for storage and distribution of water.
	Private sources of water supply	All private sources of water supply within the Paurashava shall be subject to control, regulation and inspection by the Paurashava. No new well, water pump or any other source of water for drinking purposes shall be dug, constructed or provided except with the sanction of the Paurashava.
	Drainage	The Paurashava shall provide an adequate system of public drains in the and all such drains shall be constructed, maintained, kept, cleared and emptied with due regard to the health and convenience of the public. All private drains shall be subject to control, regulation and inspection by the Paurashava

Major activity	Specific functions	Functions in brief
	Drainage scheme	The Paurashava may prepare a drainage scheme in the prescribed manner of the construction of drains at public and private expense. The drainage scheme as approved by the government shall be executed and implemented within specified period.
	Bathing and washing place	The Paurashava may from time to time set a suitable place for use by the public for bathing, washing cloths, or for drying cloth. Specify the time at which and the sex of persons by whom such places may be used. No person shall establish, maintain or run a bath for public use except under a license granted by the Paurashava.
	Dhobi ghat and washer men	The Paurashava may provide dhobi ghats for the exercise of their calling by washer men, and may regulate the use of dhobi ghats and levy fees for their use.
	Public water-course	The Paurashava may declare any source of water, spring, river, tank, pond, or public stream, or any part thereof within the Paurashava, which is not private property, to be a public watercourse.
	Public ferries	The Paurashava may by by-laws provide for the licensing of boats and other vassals plying for hire in a public water-course to be a public ferry and may entrust the management thereof to the Paurashava, and there upon the Paurashava shall manage and operate the public ferry in such manner and levy such tolls as prescribed.
	Public fisheries	The Paurashava may declare any public watercourse as a public fishery, and there upon the right of fishing in such water course shall vest in the Paurashava which may exercise such right in such manner as may be prescribed.

### 5.3 Strength and Weaknesses of the Existing Policies

The Consultant has identified following weaknesses in the existing policies. These are – accommodation of future thrust of growth likely to arise after construction of the 1st Padma Bridge at Maowa point, supply of safe drinking water, providing safe and easy accessibility, use of agriculture production in income generating activities and create provision for further investment.

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

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

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



# CHAPTER 6

## 6. CRITICAL PLANNING ISSUES

### 6.1 Transport

Van and rickshaw are two major transport modes in the study area. Bicycle is the main mode for private users. Movement of motorcycle is also identified as major private mode. Inadequacy of bus service found normal scenario in the study area. The peak hour traffic movement is found in morning from 9am to 10am and in the afternoon from 4pm to 6pm in general. Overall traffic congestion is low, let it should not be increased. The movements of Nosimon which is very risky need to restrict to keep the urban area risk free, clean and sound. Establishment of bus route within the study area is another prior demand of the people.

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

Highway traffic is comparatively low-dominated by mixed-type of vehicles including non-motorized. Generally, surface of the highways excepting for a larger 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 occurs for a little while. In spite of this situation, present road network is functioning well. But it has to be upgraded to accommodate the future increase of traffic volume that is expected to increase due to the construction of 1st Padma Bridge at Maowa point.

### 6.2 Environment

In the Paurashava, water pollution and solid wastes are the major environmental problems. Pesticides use in agriculture land, chemicals and food use in pisciculture, poultry feed use in poultry farming and bathing and washing in river water are the causes of water pollution. Household garbages, kitchen market garbages and garbages produce by the pedestrians are producing solid waste problems. Systematic approaches will be needed to remove those problems.

### 6.3 Landuse Control

Accommodation of future thrust of growth likely to arise after construction of the Padma Bridge, supply of safe drinking water, providing safe and easy accessibility, use of agriculture production in income generating activities and create provision for further investment.



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

Impact of construction of Padma Bridge is extremely difficult to make a growth projection with sufficient precision. Many factors are involved with this. Those factors are rapid change of land use from agriculture to non-agricultural activities, rural homesteads will change their character by the urban dwellers, land value will increase and the farmers will sell their farming land and shift elsewhere where low land value exists, spotted industrial development emerges and a mixed urbanization character will be formed, low lands adjacent to the communication network will be filled and will create drainage congestion.

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

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

High value agriculture land should be preserved only for agriculture purposes. The land produces three crops in a year are under this category. Any physical development activities should be prohibited by the Paurashava authority. In the Paurashava, high value agriculture land is found in the Ward No. 4, 6, 7 and 8.

Drainage congestion due to the indiscriminate development activities is another critical issue. With the increase of population and commercial activities, lands of the Paurashava town are being converted for habitation. Natural development of those settlements somewhere creates drainage congestions. Drainage congestion areas in the Paurashava are Char Pangasia, Char Thengamara in Ward No. 2, Char Jhautala and Char Krisnanagar in Ward No. 4, Char Laxmipur and Kastagar in Ward No. 6 and Dakkhin Janardandi in Ward No. 8.

Missing links in road transportation creates accessibility problem. In the intersections, lands are used by commercial activities including daily bazar and saw mill. Most of those are government lands. Vehicular accessibility became zero in those areas.

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

#### **6.4 Disaster**

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

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

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

#### **6.5 Laws and Regulations**

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

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

In the Paurashava, 69.8% (except water bodies) land is under agriculture use. Most of those lands are private. Different type of help is necessary for the farmers involved with those agriculture lands. Section 13(1a) of the Agricultural Development Corporation Act, 1961 prescribed regulation on the function of the Corporation and said that “the Corporation shall make suitable arrangements throughout East Pakistan, on a commercial basis, for the procurement, transport, storage and distribution to agriculturists of essential supplies such as seed, fertilizers, plant protection equipment, pesticides and agricultural machinery and implements.” Where the Corporation is absent, how the farmers will get benefit prescribed in the section 13(1a)? To increase the agricultural commodities such type of help is necessary.

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

## **6.6 Others**

The Paurashava can control the Dhobi Ghat as prescribed in the Second Schedule of the Paurashava Act, 2009. About 8 Dhobi Ghat is found in the Kalkini Paurashava. Those Ghats are using for bathing and washing of the Paurashava inhabitants. Most of them are located by the side of Arialkha and Palardi Rivers. Number of Ghats is showing the necessity of water. The Arialkha and Palardi Rivers are linked with the Padma River. Pollution of Arialkha and Palardi River water pollutes the Padma River water. People awareness is necessary to use that river water.

# CHAPTER 7

## 7. LAND USE ZONING POLICY AND DEVELOPMENT STRATEGIES

### 7.1 Strategies for Optimum Use of Urban Land Resources

Inhabitants of the Paurashava are not aware about the land level and slope direction of the Paurashava. Without knowing this information they are raising their land up to a mark and constructing permanent structure. As a result, water logging problem during rainy season is all over the residential areas.

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

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

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

At present, except 70% agriculture land, 16% residential development and 9% water bodies, rest 5% land are using for various purposes. Again, among 16% residential and 5% other developments, only 2% land is covered with pucca structures (called permanent structure). For rearrangement and enforcement of new provision those 19% ( $16\% + 5\% - 2\% = 19\%$ ) land will generate planning scope. Due to the absence of airport and helipad, vertical expansion of the building will be encouraged in anywhere of the Paurashava. New innovation for increase the agriculture production may be encouraged also.

Prior to planning, strategies have been developed for issues like, utilities, circulation and drainage both for core urban areas and urban fringe areas. The steps of strategies for formulation master plan are based on the policy recommendations and standards suggested by the LGED. All those aspects are very vital for creating livability in Paurashava area.

### Policies and Strategies

In relation to the landuses, the expected cluster development policies are:

**Review the selected clusters and prepare guidelines for their development:** In carrying out this task, Paurashava will pay particular attention to the scale of growth to be accommodated in each cluster. This will be influenced by the local pressures for growth and capacity of each cluster to absorb such growth. In relation to the tentative list of clusters identified in the Chapter-3, the following comments need to be made:

First priority clusters are the market areas (Kalkini Bazar in Ward No. 1 and 4 and Local Bazar in Ward No. 3 and 9). Variations between the scales of growth to be accommodated in each of the markets will be found. Second priority clusters are located on the fringes of the existing Paurashava town centre. They are areas where pressure for growth is already strong. Their inclusion in the list is therefore almost inevitability. However, the long term costs associated with large scale development in all four of these clusters - Western part of the Ward No. 9 between the river and Barisal Highway, Central part of the Ward No. 6 adjacent to the river, Central part of the Ward No. 3 adjacent to the local road and Eastern part of the river of Ward No. 1 adjacent to the local road – suggest that the policy should be to provide for growth whilst containing it as much as possible.

Those clusters are in rural character, objective of the Paurashava will be to ensure that the use of land is appropriate to this character.

**Limit industrial use outside the existing town centre and the proposed extensions to the town centre:** Location of manufacturing activity may have benefits to the local communities in which the manufacturing activity is located – through provision of direct or indirect employment and benefits to the entrepreneur in terms of reduced costs. However, it may also have disadvantages, say, for example, if the infrastructure is not available to deal with the effluent (whether it be air borne, water borne or in the form of solid waste) of the manufacturing processes being undertaken in these relatively remote locations.

Encourage the development of non-urban uses such as agriculture and forestry on land on the periphery of the Town centre which is unsuitable for urban development.

### **Optimization of the Existing Urban Land Resources**

Jurisdiction of the Kalkini Paurashava is 7473.20 acres (30.30 sq. km.); population is 38498 with gross density 5 persons per acre. In the year 2031, the population will be 64125 with gross density 9 persons per acre.

At present, agriculture and water body includes 69.8% and 8.69% land respectively. Some important landuse determining factors like government policy, industrial establishment, construction of road including embankment and availability of services may change the

agriculture domination in next 20 years. Question raises that how much this change will affect the present land resources?

During last ten years, the landuse scenarios remain same. A stagnant character of landuse change still stand due to the existence of river named Padma. Rapid change of landuse will be viewed after the construction of Padma Bridge at Maowa point. Except this, present population distribution and growth including migration shows that the area is developing significantly in terms of trade and large business and trying to get out of agriculture based activity.

After preparation and implementation of master plan / urban area plan changes in the physical character of the Paurashava will be viewed. These changes will be provided by the infrastructural and community services development. According to the master plan / urban area plan and Ward Action Plan this change should not exceed 5% to 10% from the total land of the Paurashava for next 20 years. Conversion of agriculture land in to infrastructural development may be considerable only for construction of embankment and road.

### **Zoning Policies and Strategies**

Zoning is an effective guideline for the preparation of landuse plan. According to this guideline, specific use should be in specific area; height of the building will be controlled for easy access of sunlight and wind flow and ensuring availability of open spaces in every lot with the controlling of building density. For the sake of zoning provision in the Paurashava, core area, fringe area, peripheral area and new urban area is being demarcated accordingly.

#### **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. The core area includes northern part of the Ward No. 2 and northeastern part of the Ward No. 1.

**Policies:** Existing town centre will be defined as core area. Mostly mixed-use areas are the important characteristics of the core area. Size of the core area is 644 acres. With the increasing of density, this area will lost living environment. Further expansion of the core area will be discouraged in the plan.

**Strategies:** Let the core area remain up to the plan period. No physical development provision will be initiated by the Paurashava. Vertical and horizontal expansion of the structure or establishment may be approved by the Paurashava with high rate.

**Table 7.1: Proposed zoning areas**

Landuse Type	Area (acre)	%
Agriculture	4860.63	65.04
Core Area	644.11	8.62
Fringe Area	349.86	4.68
Major Circulation	237.08	3.17
New Urban Area	176.05	2.36
Peripheral Area	639.93	8.56
Waterbody	565.48	7.57
Total	7473.14	100.00

### **Fringe area**

This zone is identified as 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. Eastern part of the Ward No. 9, southern part of the Ward No. 7 and northern part of the Ward No. 1 is being demarcated as fringe areas.

**Policies:** The area, adjacent with the core area, ideal for rapid urbanization is considered as fringe area. Total area is 349.9 acres. Important community facilities, utility services and residential development will be the basic components of the fringe area. Improved transportation and communication linkages, better water supply and drainage facilities including rain water reservoirs will be the planning components.

**Strategies:** The guidelines set in the policy may be implemented by the different public authorities. A close coordination among those authorities should be maintained during implementation of the planning component. Any change of the planning should instantly be resolved with the involvement of the Paurashava authority.

### **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.

Southern part of the Ward No. 4, western part of the Ward No. 7, northern part of the Ward No. 2 and eastern part of the Ward No. 1 is identified as peripheral areas.

**Policies:** Agriculture domination will be the prime characteristic of the peripheral area. Rural homesteads, spotted important development like park, dumping ground, stadium and agro-industries are the important planning components of this area. Total area is

639.9 acres. Any contrast regarding the implementation of those planning components should not be encouraged.

**Strategies:** Phase-wise development will be encouraged. Individual authority may implement individual component. Coordination among the authorities is not mandatory. Locational change of the proposed components should be discouraged.

### **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 being proposed to be developed within the year 2031. A parcel of land under western part of the Ward No. 9 is being proposed as new urban area.

**Policies:** Planned development will be the prime characteristic of the new urban area. Housing with greeneries, important development like park, commercial centre, educational institute, improved health facilities, community centre, road with footpath including drainage facilities, water supply and fire service are the important planning components of this area. Any contrast regarding the implementation of those planning components should not be encouraged.

**Strategies:** Phase-wise development will be encouraged. Individual authority may implement individual component. Coordination among the authorities is not mandatory. Locational change of the proposed components should be discouraged.

### **Agriculture**

Agricultural land (also agricultural area) denotes the land suitable for agricultural production, both crops and livestock. It is one of the main resources in agriculture. The land under annual crops, such as cereals, sugarcane, jute, 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. Large track of land in all the Wards are in agriculture practice. Most of those lands preserve as agriculture / farming land.

**Policies:** Agricultural domination will be the prime characteristic of the Agriculture zone. Agricultural commodities as mentioned earlier are the important components of this area. Total area is 4860.6 acres. Any cropping combination may be encouraged.

**Strategies:** Any agricultural practice will be encouraged. Individual authority may supervise and subsidize agricultural inputs to the farmers for increasing the production. Coordination among the authorities is not mandatory. Any physical development should be controlled by the Paurashava (except bridge, culvert, drain and road).



## **Waterbody**

Water body contains 566 acres excluding khal, pond, irrigation canal and river whose area more than 0.25 acre.

**Policies:** Rainwater harvesting and pisciculture will be the prime characteristic of the pond and river will be preserved for outfall of the drainage system including irrigation purposes and water ways. Any contrast regarding the implementation of those components should not be encouraged.

**Strategies:** Individual authority may control individual component such as pond by the Paurashava and river by the Water Development Board. Coordination among the authorities is not mandatory. Any change of the components should be discouraged.

## **Circulation**

Major circulation contains major road network with regional and national settings.

**Policies:** Easy accessibility with national, regional and local will be the prime characteristic of the circulation network. All transportation infrastructures should be incorporated as the important planning components. Total area is 237.08 acres. Any encroachment or contrast regarding the implementation of those transportation infrastructures should not be encouraged.

**Strategies:** Phase-wise development will be encouraged. Individual authority may implement individual component. Coordination among the authorities is not mandatory. Locational change of the proposed components should be discouraged.

## **7.2 Plans for New Area Development**

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

Future landuse will be calculated according to the development control for the masses. In case of public land, existing use and khas land will be emphasized. Willingness and participation of the people in development activities will be the key factor for future landuse demarcation. Slow change of landuse will be emphasized rather than rapid change. Let the people do whatever he likes on own land – such concept should not be considered for future projection of landuses. Three parts of the projection are landuse change, landuse control and landuse restriction will be included in the Master Plan. In

any case, river front areas should be restricted for human habitation. As a result, river water will be safe from contamination.

The agriculture land should be preserved (according to the Agriculture Policy) from any type of physical development. It should not be decreased with the expansion of habitable area or formation of new settlement, may be increased with the formation of char lands. In case of

road, embankment, drainage and new urban area, the agriculture land may be used but such use should be guided according to this plan. For the development of pisciculture, all ponds (not lower than 0.15 acres) and ditches may be preserved, in some exceptional cases; small number of ditches and ponds may be used for physical development activities.

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

### **Policies and Strategies**

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

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

The policies and strategies of the Paurashava related to new area development are – **Explore and Implement means of increasing the number and pace of public sector land development projects:** This is one area where government can have a direct influence on accelerating the rate of conversion of non-urban to urban land.

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

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

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

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

**Assist the transition of areas on the fringes of the extension urban areas from non-urban to urban use:** The main priority here seems to be space for adequate access and drainage. Once this space is available, the roads, drains and other services can be installed as and when the resources are available to provide them. But without this space, rational development of such areas is impossibility, environmental problems occur and the pace of development is often seriously impeded.

If the Paurashava has the resources and to achieve this by acquiring land (either through negotiation or compulsory purchase) and ensuring that it remains free from development until needed, then the Paurashava will purchase this as a policy. If not, then a potential alternative approach is to work with the local community, particularly the landowners, to see if the space can be made available by readjustment of existing ownerships. Given the importance of this task the Paurashava will pursue an active policy of assisting the rational development of the fringe areas, by whatever means proves workable.

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

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

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

### 7.3 Areas for Conservation and Protection

Type of area and structure which will conserve and protect is presented here.

- Historical building, monument, sculpture or any other related articles.
- Park, important playfield or any other active recreational areas.
- Government buildings like Dakbanglow, Court Building, Circuit House, D.C office, Paurashava office and official residence of the Paurashava Mayor.
- Riverfront areas where people spent their leisure time.
- Any other public establishment like Zoo, Museum, Flood shelter, etc.
- BM Pillars.
- Rail station, Bus Terminal and Launch / boat ghat.

#### Policies and Strategies

For conservation and protection areas, following policies and strategies are considered –

**Take environmental issues into account in all decisions related to the future development:** By considering environmental issues in its entire decision making, the Paurashava aims to ensure that progress is made towards resolving the environmental

problems exist and towards resisting the further deterioration of conditions beyond their present level.

The issue of polluting manufacturing processes is best dealt with by legislation at the national level. However, the Paurashava has a valid and important role to play in deciding the location of industry. It can confine polluting industry to a single or a limited number of locations, where prevailing winds will not carry airborne pollution over the Paurashava Town and where facilities for dealing with water borne effluent and solid waste disposal have a greater chance of being provided.

Impose restrictions on the location of new polluting manufacturing processes and identify suitable locations for their establishment: A long term program of controlling the emission of pollutants from existing industrial activities and removing chronic polluting industry from unsuitable locations can also be pursued in association with the appropriate authorities. To be effective, this will need the force of law. One case is break-making. It is of value to the economy but is understood to have adverse environmental consequences. This is carried out in two locations throughout the study area.

Monitor adverse environmental impacts of existing manufacturing processes and take measures to reduce such impacts to acceptable levels: The issues of the health hazard caused by current methods of solid waste disposal and sewage disposal can be addressed by improving the existing methods of providing these services.

**Reduce noise levels from the worst noise nuisances:** The issue of pollution from vehicles is unfortunately likely to get worse – as the rates of vehicle ownership and usage increase – before it gets better. Some relief may however be afforded by improvements in the quality of emissions, as older vehicles are replaced by newer ones, and as technological developments continue to be made in emission control.

**Identify and protect areas of ecological significance:** It is important that such areas are protected before they are inadvertently destroyed. This policy will extend to areas of forest / bushes and areas of un-spoilt river line. Once the initial priority of protection is successfully achieved, measures can be taken to enhance the quality of these areas.

**Map 7.1: Structure Plan of Kalkini Paurashava**



**Conserve buildings and monuments of cultural, architectural and historic interest:** Such buildings and monuments are an important legacy of the past, reflecting different historical, cultural and national influences. The Paurashava will arrange for such buildings and monuments to be identified and listed. Following this, it will be necessary to draw up a program for their conservation. This program will need to consider the scope for enhancing the settings of the buildings and monuments, as well as ensuring preservation of their fabrics.

**Protect and enhance significant areas of open space within the Paurashava Town:** The open spaces create character of Paurashava, distinguishing it from other Paurashavas in the country. Unless such spaces are protected, there is a strong likelihood that they will be gradually converted to urban uses and thus lost for the benefit of the community as a whole.





# CHAPTER 8

## 8. STRATEGIES AND POLICIES FOR SECTORAL DEVELOPMENT OF THE PAURASHAVA

### 8.1 Socio-economic Sectors

#### 8.1.1 Population

The policies in relation to population are set out below.

Expected growth of population and changes of socio-economic characteristics: The population projection will need to be reviewed time to time in the light of new evidence. At a minimum this will need to be done at ten years intervals, as the results of Censuses become available. The Paurashava authority will need to monitor the factors affecting population growth – namely fertility, mortality and net inward migration and the factors reflecting changes in its socio-economic characteristics.

Rational distribution of population within the Paurashava: One of the main purposes of a master plan / development plan is to provide for the rational distribution of population, in relation to other urban activities and suitability of land for urban purposes. The Paurashava will pursue the policies required to achieve the spatial development strategy. It will also monitor change, assess the effectiveness of the policies being pursued and review the strategy as and when necessary.

Ensure availability of land, services and facilities according to the needs of the population: As the body responsible for planning and managing urban development, the Paurashava will ensure that land, services and facilities reflect the build up of population and changes in its requirements. This is a task for which it will require the co-operation of many agencies involved in urban development in the Paurashava.

#### 8.1.2 Economic Development

The prospect related to economic activities summarizes in the following discussions:

Some small-scale pisciculture is located in the Kalkini Paurashava area. About 58 households are involved with such pisciculture. The production mostly uses in the Dhaka City and Madaripur Zila. Investment in this field will bring huge prospects of the Paurashava. Other economic prospect summarizes in the following discussions:

- Availability of unskilled and cheap manpower.
- Availability of agriculture land. The land may be used for different agricultural production and those productions may be used for the input of agro-based industries.

- Due to the nearness of Dhaka City, the Paurashava may be developed as the fringe area of Dhaka City. This fringe area with its agriculture production will support to the Dhaka City where marketing for those productions are available.
- The Paurashava has been developed as growth centre concept. Some cluster development is found around this growth centre. Planned development through this master plan will initiate to arrange the growth component in a systematic manner. At the sametime, economic development parallel to the physical and social development will be encouraged.

Most of the entrepreneurs expressed their desire of implementing future development plan. A major portion mentioned that their development plan is the expansion of their enterprises (60%) and others intend to increase their production (40%). Expansion of existing industries and establishment of new industries will create more jobs and thus have multiplier effect in the overall economy leading to create more consumption capacity, investment opportunities in diversified economic fields and thus push the economy upward.

If the standard of living of the people of the Paurashava is not to deteriorate as the additional population discussed before, then the economy of the Paurashava must expand at least in step with the growth of population. For unless the population have the financial resources (through employment of business) to pay for the urban services and facilities they want, they will either have to rely on Government subsidy or they will go without.

### **Policies and Strategies**

Given emphasize on the above situation following policies have been identified. These are all additional to the general requirement to ensure that land and infrastructure are available to support the wealth generating elements of urban development.

Encourage national business to locate in Kalkini Upazila / Madipur Zila: If national business can be encouraged to locate in promoting Paurashava / Upazila / Zila, they will provide not only earning capacity for their locally recruited employees but the opportunity for services to be provided to support the business. The Paurashava will, therefore, assist central government in promoting Paurashava as a potential location for inward investment of this type.

Encourage central government to decentralize facilities from Dhaka: Central Government has control over the location of many facilities which are currently located in Dhaka, such as Government departments, the headquarters of nationalized or Government banks and quasi Government bodies. The Paurashava will encourage Central Government to offset the current strong tendency towards centralization of facilities in the Capital by relocating some of these facilities to Paurashava / Upazila / Zila.

Overcome the constraints on compatible landuse: Where established agricultural, industrial and commercial operations are compatible with the objectives of the Structure Plan, the Paurashava will work with these operations to overcome the constraints to their expansion. Where wealth generating activities are constrained in their desire for expansion by lack of land, access or infrastructure provision, the Paurashava will, in conjunction with the other relevant authorities, endeavour to overcome these constraints.

### **8.1.3 Employment Generation**

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

It is found from the study that the entrepreneurs of the planning area generally suffer from the following common problems:

- Lack of cheap and dependable source of energy (gas supply).
- Unreliable electricity supply.
- Absence of better access facilities with the capital city.
- Absence of railway connection with the capital city and with surrounding Zilas.
- Insufficient communication infrastructure.
- Shortage of skilled manpower.
- Complex official procedures in setting up a new industry (cumbersome processes of getting infrastructural and utility services connections, lack of manufacturing-investment-friendly banking / credit system).
- Lack of government initiatives.

Once the area developed as a trade centre based on the river communication. The traders who bring their commodities through the river the market of the Paurashava

acted as a boat ghat after the unloading of commodities from the boat. From then, development activities started along the riverside. This trend has been continued up to the recent years.

### **Policies and Strategies**

Improve industrial areas and ensure their full utilization: Conditions in the existing industrial areas of the Paurashava especially environmental ones associated with the disposal of effluent and waste are currently poor. It is the policy of the Paurashava to improve these conditions and to reduce pollution from the worst offenders to acceptable levels. In certain cases this may require cessation of an existing activity or removal to another location.

Within each of the existing industrial areas there are vacant and underutilized areas. It is the policy of the Paurashava to ensure that the spare capacity available within these is utilized to the full. In the short and medium term these represents a better use of resources than identify new areas.

Locations for new industrial areas: For the longer term it is expected that new industrial areas will be required. Given the fact that the Paurashava wishes to encourage inward investment to the Paurashava, it will identify suitable locations for such industrial areas, will reserve them for industrial use and will plan for provision of the required infrastructure.

Provide assistance to small-scale industrial and commercial operations: Considerable potential for growth of the economy rests with small-scale industrial and commercial operations. The Paurashava will, in conjunction with other relevant authorities, provide assistance to such operations by promoting the establishment of estates specifically suited to their needs. These will probably need to be small in size and located within or close to residential areas.

The Paurashava will also consider the other needs of small-scale industrial and commercial operations and endeavour, through others, to ensure that these needs such as for credit are available.

#### **8.1.4 Housing and Slum Improvement**

Housing is one of the vital components of urban life. It is a source of security, safety and everyday comfort. Rural housing components are prevailing in the Paurashava. In most cases, housing in growth centre is appropriate for the study of housing in the Paurashava.

**Housing in rural environment (called rural homestead) according to the trend of primitive society is the suitable word for the identification of Paurashava housing.**

Amalgamation of pucca, semi-pucca and katcha housing or semi-pucca and katcha housing in a house is viewed in most of the Wards.

Residential areas in Kalkini Paurashava have been developed sparsely following some degree of uniformity. According to the number of residential buildings Ward No. 1, 3, 7 and 8 dominate the highest number of residential buildings but according to the density Ward No. 7 is highly congested area. All pucca residential buildings are developed on and around the commercial hub of Ward No. 1 and 7. About 13% of the dwellings in the Paurashava are in good condition. About 8% needed to be demolished due to their dilapidated conditions, while about 12% is new construction.

### **Building materials**

The Paurashava is dominated by rural environment; as a result about 90% structures are found katcha, constructed with temporary materials like bamboo thatch, C.I. Sheet and wood. Only 6% are semi-pucca structures that are wall made with brick and the roof with C.I. Sheet. On the other hand, 4% houses are pucca that is constructed with bricks and concretes. The building materials used for the construction of houses reflects poor economic condition of the owners.

### **Floor area**

About 910 structures are pucca and among them, 22 three-storied and 3 four-storied and above. Floor area of those pucca structures are varied from 1200 sq. ft. to 2600 sq. ft. The semi-pucca structures are preserving two characters according to the location; where semi-pucca structures are in rural areas deserve large floor area rather than semi-pucca structures in urban area. In rural area, floor area of the semi-pucca structures are varied between 1800 sq. ft. to 3000 sq. ft. but in urban area it is within 1000 sq. ft. to 1500 sq. ft. Comparatively, floor area of the katcha structures are larger than the floor area of the pucca and semi-pucca structures. In an average, floor area of the katcha structures is between 2000 sq. ft. to 3500 sq. ft. Most of those structures are living room and located in the rural environment of the Paurashava.

### **Housing finance**

Housing finance is one of the most important problems of housing promotion. Besides, the Paurashava also suffers from the problems of utility services like, waste management, sanitation and drainage. Road development can not keep pace with population and urban physical growth. Most man-made drains are clogged, causing waste water overflow at many points. There is no program for slum rehabilitation.

Overwhelming majority of the land owners are depended on self-financing for housing construction. Low house rent is a major cause for small number of constructions.

Over 96 percent of the housing supply comes from informal private sources. The formal organized private commercial housing is yet to emerge in the Paurashava. The NGOs

usually operate in low income areas where they provide services and cash finance instead of complete housing units.

### **Problems Concerning Housing**

Housing areas in the Paurashava is the composition of an admixer of housing types. Mixed residential, poor dominated rural houses and semi-urban homesteads are found. Most housing areas have developed in a spontaneous fashion. In the rural part of the Paurashava, with its rural-agricultural character, has a different housing type. The dwellings, comprising homesteads, encompass larger areas having low density. The highest gross population density in the Paurashava is only 11 persons per acre. Buildings in the Paurashava are dominated by katcha structure (90%). No building is found approved from Paurashava. However, owners of the buildings have been found violated the setback rule by the construction. Except labour charge there is very little variation in building construction cost between Dhaka and Kalkini Paurashava.

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 squatting in public land. They are not only deprived of minimum housing but also from the personal security that endanger their health and working efficiency. Regular income can solve most of their housing problems. Apart from dwelling, pure water and transportation are real problems for the inhabitants. Municipal services are highly inadequate. Drainage is major problem in rural part of the Paurashava. The Paurashava can not solve the problems due to scarcity of fund.

In the Paurashava, over 98 percent housing structures are one-storied that includes semi-pucca, katcha and Jhupri type houses.

### **Prospects Concerning Housing**

In the study area above 97 percent of the households became land owners through inheritance, while about 3 percent became owners by way of purchase.

Land value in the Paurashava is very low compared with Dhaka and Faridpur. In spontaneous housing areas of the core area, habitable land sells between Tk. 44,000 to Tk. 50,000 per decimal.

About 10% household in the Ward No. 7 and 4% in Ward No. 9 live in rental houses and pay Tk. 500 and less each month as house rent.

For effective promotion of housing the government should change its role to a facilitator instead of a provider. Government agencies should provide infrastructure and finance on soft terms and the rest should be left with the private sector. To realize the development and service costs of public sector infrastructure projects from the beneficiaries it is

necessary to evolve new mechanism. If real estate developers encourage to come up with housing projects the Paurashava should maintain some control over them to safeguard public interest. Public sector may take up innovative cost recovery housing programs for the rural poor.

### **Policies and Strategies**

The National Housing Policy, 2004 could have a major impact on the quality of life for Paurashava inhabitants. In this context, the Paurashava will pursue the following four policies. These are all geared to lessening the gap between need and provision of housing.

**Identification and development of sites for government housing schemes:** Where, as part of National Housing Policy, the Government embarks on further housing schemes either for the construction of completed units or for the provision of serviced plots, the Paurashava will assist the relevant body with the identification and development of appropriate sites.

**Identification and development of sites for private sector housing schemes:** Where housing is to be provided by the private sector, the Paurashava will ensure that, either by its own efforts or by the efforts of others, the legal, technical and financial support required by the private sector is available – to enable it to assemble sites, to carryout the earthworks and drainage works needed for the development of the sites, to provide the necessary tertiary infrastructure, and to provide the units of accommodation required. The Paurashava would, in this instance, be acting as an enable to the private sector.

**Provision of sites and services schemes for the low and lowest income groups:** In line with National Housing Policy, greater priority needs to be given to the low and lowest income groups. Accordingly, the Paurashava will, therefore promote, either by its own efforts or by the efforts of others, the provision of sites and services schemes for these income groups.

**Upgrading of slum and squatter settlements:** The most disadvantaged people, in terms of access to housing, live in slum and squatters. Modest investment in terms of provision of facilities such as water supply, drainage, sanitation facilities, electricity and dry access-ways can make a considerable improvement to the living conditions of a large number of people. The Paurashava will, therefore promote, either by its own efforts or by the efforts of others, the upgrading of slum and squatter areas.

An important contribution that the Paurashava can make to meet housing, as well as other urban needs, is in exploring ways by which the process of converting land from an unimproved agricultural state to an improved state on which individuals can build their homes – can be speeded up. Because, housing is such an important landuse both in terms



of the total area of land it occupies in urban and in terms of being a major determinant of the quality of life of its inhabitants, the Paurashava may pursue a further policy.

#### **8.1.5 Social Amenities and Community Facilities**

Due to the presence of Kalkini Bus Stand, the Paurashava exhibits high potential of socio-economic development. The National Highway passes through the Paurashava is the destination of all south Bengal movements. The activities around the bus stand will generate employment in commercial sector. This effort will be faster with the commissioning of 1st Padma Bridge at Maowa point. New investment will gear up in to Kalkini creating new jobs. This will enhance income of the local people and raise their standard of living. Investment and employment will take place in transport, industry, construction, trade and service sectors. Besides, there is a large scope for agro-based development in Kalkini. This will generate new employment.

#### **Policies and Strategies**

A most important initial role of the Paurashava will be to appraise itself of the situation with regard to both the need for and supply of community facilities in the Paurashava. With this in mind, the Paurashava will pursue the following policies.

Monitoring the principal aspects of community facility provision in the Paurashava: The organizations responsible for the provision of community facilities in the Paurashava will co-operate with the Paurashava in supplying information needs to pursue the policy. At a later stage, according to the needs of the population, the Paurashava can extend this policy to include contributions to meeting the needs such as identifying areas where demand is higher, identifying appropriate targets for provision, identifying sites and assisting in ensuring that any obstacles to the development of a site can be overcome.

Until the Paurashava is in a position to devise policies which will make a positive contribution to ensuring that the supply of community facility provision is geared to the areas and the groups of the population most in need, it is recommended that the Paurashava pursue only two further policies, such as –

Assist with the identification and development of sites for public community facilities: Where needed, the Paurashava will work with the public agency responsible for the provision of community facilities to ensure that a suitable site is chosen and developed. In some instances the Paurashava will play the lead role in the establishment of a public community facility. As an example, establishment of wholesale or retail markets to serve local communities.

Assist with the identification and development of sites for private sector community facilities: Where a private sector sponsor is encountering difficulties in providing a

community facility, the Paurashava will also work with the sponsor to ensure that a suitable site is chosen and developed.

#### **8.1.6 Tourism and Recreation Facilities**

Recreational facilities like Cinema Hall, Theater, Shishu Park, Picnic spot, etc. are included in this category. No recreational facility is found in the Paurashava. Policy for tourism and recreational facilities may follow the policies prescribed before on the social and community facilities.

#### **8.1.7 Safety and Security**

Cantonment, however, is governed by its own Act, BDR, Police, etc. areas have to be safeguarded from any possible incompatible development. The key point installations including radio, television, water treatment and pump station and power station sites, Circuit House will have to be safeguarded from any possible undesirable development around these areas that can endanger their security.

### **8.2 Physical Infrastructure Sectors**

#### **8.2.1 Transport**

Transportation infrastructure is a very important element to make an urban area livable. For transportation of agro-products efficient road network is also of prime importance. The study area is a centre of agro-product and pisciculture, need good transportation linkages for their transportation in time. The potential economic activities due to agro-product oriented industry and 1st Padma Bridge need improved transport facilities with a substantial investment. The potential economic (including agriculture) development envisages improvement of the transportation network to facilitate development that can meet the demand on regional basis. Actually, the area is served by only one National Highway which may become inadequate due to induced activities on completion of the 1st Padma Bridge. Several new roads will be needed for efficient movement of man and goods towards regional centres.

#### **Policies and Strategies**

Following strategies will be adopted to promote circulation network:

- A comprehensive road network will be prepared for the Paurashava using a hierarchy of road network.
- In case of local roads, a participatory approach will be developed to realize at least a part of the cost of development from the beneficiaries. This will also help to reduce delay and cost involved in land acquisition procedure.
- Proposed roads in those areas will be chosen for immediate developments that deserves growth potentiality.

- Incremental development approach will be adopted to get rid of unnecessary costs in development of roads (the road remain underutilized).
- Service roads will be created along with major roads to allow free flow of long distance traffic.
- A restricted buffer zone will be proposed along primary roads passing through agriculture and discourage roadside development.

### **Role of Bangladesh Inland Water Transport Authority**

The Arialkha River is flowing on the eastern part from north to south and Palardi River on the western part from north to south of the Paurashava. Bangladesh Inland Water Transport Authority (BIWTA) is responsible for maintaining its navigable character. Unauthorized encroachment in different locations of these rivers is performing by the dwellers. At present, the BIWTA is not performing any responsibility regarding this river. Apparently no major problem in the area of water transport services is found.

#### **8.2.2 Utility Services**

Utility services found through topographic and physical feature indicates that the Paurashava is too poor in development of those services. With the development of physical condition of the Paurashava, substantial development will be needed for utility services. Drinking water supply, sewerage and sanitation facilities and dumping of solid wastes should be emphasized as primary consideration. All the people (except 10.0%) are dependent on hand tubewell for drinking water. In the Paurashava there are 6600 tubewells and most of them are contaminated with iron and arsenic. Absence of solid waste dumping ground creates health hazards. Absence of covered drain and sewerage system creates sanitation problem in the Paurashava. Those problems should be removed through the proper planning and design.

### **Policies**

In the Kalkini Paurashava, average height of the Wards is 3.1 meter and differences among the Wards are 1.0 meter to 8.92 meter, but outside the Paurashava boundary lowest land level value is lower than 1.0 meter. It means a steep slope from 1.0 meter to 8.0 meter prevails in the Paurashava and its surrounding areas. Such type of land level is ideal for construction of drain and sewerage facilities.

Due to the presence of vast agriculture land (about 70%), township should not be expanded on those lands because height of those lands are four to five meter lower than the habitable land and five to eight meter lower than the regional highway. Substantial earth filling will be needed for creating living construction on those agriculture lands.

## **Strategies**

Based on the above understandings, following strategies follows for planning of utility services:

- Low-cost development will be promoted in phases, based on comprehensive plan for the demarcated areas.
- Only those areas will be targeted as new urban areas where urbanization is likely to be rapid and imminent.
- Except waste disposal, all other services will deliver by the concerned service giving agencies.

### **8.2.3 Flood Control and Drainage**

A wider scope for construction of a drainage system may be provisioned in the Paurashava. At least central areas are open for such development immediately and other areas may be followed for projected period as designed in the plan. The Paurashava is a barren field for imposing drainage system. The principles required for drainage plan are available in the area. Land slope, nearness of the natural drainage, sparse population density and soil condition are in favour of drainage construction.

## **Projection of Drains**

Existing drains in the Paurashava have not formed any network; only household centered construction to drain out waste water. Existing canal is trying to manage the drainage requirements. The canal is not well linked with man-made drain and river. No pond / ditch have been found to be connected with existing drains / canals. Lack of drainage network is causing water-logging for 4 months in the Paurashava area when it rains. The entire drainage network is required to be developed with primary, secondary and tertiary drains to mitigate the current water-logging problem.

Further development of drain will be followed the bulk density and establishment will be proposed in the Master Plan. Length, width and depth of the drain will be considered according to the density of population, road width and out falls. Slope of the drain will be maintained according to the slope of the area and the level of river water according to the seasons.

## **8.3 Environment Issues**

### **8.3.1 Natural Resources**

Specific natural resources is absent in the Paurashava. Furthermore, in long run, if question rises for the use and preservation of natural resources, policies prescribed here on the environmental issues will be followed. In special case, the Paurashava may frame new policies with the help of the government and particular department / authority relevant with the issue.

### 8.3.2 Sanitation

Almost all the areas in the Paurashava are devoid of sanitation facilities. There exists a minor process of development in certain selected Wards but limited to government quarter only. Regarding ownership of toilets it varies widely in most of the Paurashava area. Most of the households have their own toilets.

Toilet system of the planning area is mostly categorized as pucca and katcha. In spite of this, Paurashava has a modest development of pucca toilets in government zones. Sewerage system has not been introduced on a trial basis as to their popularity and acceptance. Ownership of toilets varies widely in most of the Wards. Most of the households have their own toilets and at the same time there is joint toilets found in slum areas. Sanitary toilets or pucca toilets are comparatively good in all the Wards. About 86% katcha toilet is found in the Paurashava and owner of those toilets are poor people.

#### Policies

Policies regarding sanitation facilities are –

- The organization responsible for the provision of sanitation facilities in the Paurashava should co-operate with the Paurashava authority in supplying the information needs to pursue this policy.
- According to the priorities and needs of the population, the authority (including Paurashava) can extend this policy to include contributions to meeting the needs – such as identifying areas where demand is greatest, identifying appropriate targets for provision, identifying sites and assisting in ensuring that any obstacles to the development of a site can be overcome.
- Where needed, the Paurashava will work with the government agency responsible for the provision of sanitation facilities to ensure that a suitable plan have been prepared and implemented.
- Where a private sector sponsor is encountering difficulties in providing sanitation facilities, the Paurashava will work with the sponsor to ensure that a suitable plan have been prepared based on the population demand and implemented.

#### Strategies

Following strategies have been followed for designing sanitation plan:

- To protect drainage system most of the natural canals and water courses will be preserved.
- As a measure of protection from encroachment restrictive buffer zone will be created on both sides of natural canals, rivers and other watercourses. Road and plantation will be created on those buffer zones.

- Cost of primary drainage system development in housing estates by public sector agencies will be realized from the developers.

### 8.3.3 Hazards

A disaster is the tragedy of a natural or human-made hazard (a hazard is a situation which poses a level of threat to life, health, property or environment) that negatively affects society or environment. Disaster can be classified into two categories: natural disaster and man-made disaster. A natural disaster is the effect of a natural hazard (e.g. flood, volcanic eruption, earthquake or landslide) that affects the environment and leads to financial, environmental or human losses. Man-made disasters are disasters resulting from an element of human intent, negligence, or error, or involving a failure of a man-made system.

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

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

### 8.3.4 Environment Aspects

Three aspects named provision of dustbin, public toilet and solid waste produces by the hat / bazar are presented here. In the Paurashava, in total, 4 public toilets, 7 markets and 4 dustbins are being located in different Wards. Those 4 public toilets for 38498 populations, 7 markets produce about 2 ton solid wastes daily (no dumping ground in the Paurashava) and 4 dustbins for 7897 households. The scenario demands an effective solid waste management system for the Paurashava.

**Policies on Solid waste Management:** In order to improve the solid waste problem and to improve the environmental condition of the Paurashava, following Macro and Micro level policy measures will be needed:

- Formation of legislation regarding solid waste management.
- Formation of standards for collection and disposal of waste.

- Incentives for introduction of environmentally clean and efficient technology for waste disposal which would help to reduce the volume of waste and facilities more recycling.
- Construction of waste as an unutilized resource and assisting in recycling of waste for conservation of resources and protection of environment.
- Introduction of environmental education especially sanitary habits in school curriculum.

### **Environmental Issues in Agriculture Practice**

The so-called Green Revolution package was introduced into Bangladesh agriculture system in mid 1960s. It promised to increase production of cereal crops, particularly rice by the introduction of HYV seeds, application of chemical fertilizer and pesticide and irrigation. HYVs rice has contributed significantly to the progress towards the food self sufficiency in Bangladesh on the contrary increased to the environmental degradation due to the intensive use of agrochemical and other modern technology. The use of pesticide has been increased 400% per acre and its cost increased 600% during the last couple of decades. Between 1985 and 1990 the sales of pesticide became double. At present, 84 pesticides active ingredients belonging to 242 trade names have been registered in Bangladesh. Out of the total pesticide use, over 80% are used in rice fields. The rapid increase of pesticide use is causing detrimental effect on environment and health of farm workers and consumers. Pesticides are contaminating ground and surface water, which is causing depletion of inland fishing resources and ecosystem.

Pesticide use in crop production has been suspected of being a major contribution to environmental pollution. There are widespread and growing concerns of pesticide over-use, relating to a number of dimensions such as contamination of ground water, surface water, soils and food and the consequent impacts on wildlife and human health. Farmers often spray hazardous insecticides like organophosphates and organochlorine insecticides (such as DDT, lindane and toxaphene) up to five to six times in one cropping season while only two applications may be sufficient. The usual practice of draining paddy water into irrigation canals may cause river and lake contamination. Residues carried by the water can be taken up by non-target flora and fauna, leach in to soil and possibly contaminate groundwater or potable water. A greater problem lies in the bioaccumulation of pesticides in beneficial organisms like fish.

Pesticide as agricultural input was introduced in Bangladesh in 1957 and mainly DDT and BHC was distributed by the Government to the farmers free of cost until 1973. The pesticides become very popular to the farmers for two reasons; firstly quick and visible effect on pest and secondly, no cost involvement. In 1974, the subsidy was reduced to 50% and in 1979 it was withdrawn completely. Currently, 14,340.40 metric tons of

commercial pesticides are used annually, primarily in the cultivation of rice, tea, jute, sugarcane and vegetables. About 70% of pesticides are used on rice. Pesticides used on rice consist almost exclusively of insecticides, but fungicides are used occasionally. In 1989-90 almost 90% of pesticides were used on rice.

### **Increased use of pesticides leads to two primary concerns**

Adverse effects on the health of farm workers as well as others exposed to the pesticides

Polluted ground water and surface water, causing harm to the water users as well as inland fisheries and other aquatic animals.

Biodiversity is declining due to the effect of pesticide and fertilizer use. Population of native fish species is now endangered and the traditional rice-fish systems have disappeared. The bird and other small wild animals are in threat of wide spread because of the use of pesticides in rice and vegetables. Most of the rice farmers are dependent on insecticides for pest control.

Most of the farmers of Bangladesh are not capable of taking decisions on pest management and pesticide application. Often they apply pesticides when there is no real need or they use wrong chemicals at wrong doses, methods and times. As a result they kill the beneficial organisms easily and create pest resistance causing the greater problems and crop losses.

There is a suspicion that pesticide residues are common in surface water system, especially in irrigation drains, which ultimately pollute the pond and river water. There are many undocumented cases of chronic health effect of pesticides on farmers and other people. Several factors are supposed to be responsible for chronic health effect such as; improper handling, lack of protective measure, improper storage, use of obsolete pesticides, etc.

### **Chemical pesticides use in crop production**

A total of 15 active ingredients with 21 trade names, farmers of Bangladesh uses in their winter rice crop. Among 15 ingredients, 3 are fungicides and 12 insecticides. Most of the insecticides use to kill the stem borer, green leafhopper and some of grasshopper and gall midge. The fungicide uses to control the sheath blight and blast diseases. The frequency of pesticide use is varied from 1 to 4 sprays per crop season. Rate of application is not so high. The rate varies from about 1 kg/liter to 10 kg or liter per hectare of land. They had the knowledge about rate and frequency of pesticide application from the dealer and also they had considered the cost of the pesticides.

The farmers use an equal number of Organophosphates and Carbonates pesticides and parathyroid. Fortunately no organochlorines have been found to be used by the farmers.



Bangladeshi rice farmers used mostly category Ia, Ib and II pesticides that the WHO classifies, respectively extremely, highly and moderately hazardous. Almost all of the carbonate insecticides they used are of extremely or highly hazardous category having wide spectrum toxicity to the environment. The farmers used WHO category Insecticides named Stem borer, Agrifuran, Carbofuran, Leaf hopper, Biesterin, Defoliator, Sunfuran, Grass hopper, Furadan, Rice bug, Gall midge, Bashudin, Dioxathion, Plant hopper, Green leaf hopper, Karate, Cyhalothrin, Defoliators, Cymbush, Cypermethrin, Rice hispa, Ripcord, Diazinon, Diazinon Thrips, Nogozi, Leaf roller, Sumithion, Fenitrothion, Monotaf, Monocrotophos, Thrips, Malathion, Brown grass, Faifanon, Dimecron, Phosphamidon, Cartap, Fungicide, Blast, Hinosan, Edifenfos, Sheath blight, Carbendazim and Propiconazole.

Frequency of application in a crop season by the farmers is in 1st time = 11%, in 2nd time = 11%, in 3rd time = 59% and in 4th time = 19%.

The insecticide Bashudin 10G and Organophosphates was used by the largest proportion of the farmers (44%) followed by the Dimecron (34%) and Baycarb 500 EC (26%). Fungicide Knowin was used by 44% of farmers. Bashudin is an obsolete insecticide which had been used by the largest number of farmers of Bangladesh and the average application rate was also high among the pesticides used. Monocrotophos and DDVP are also known as their wide spectrum toxicity. The mostly used fungicide Knowin 50 WP is a carbonate type and it is categorized as unlikely to present acute hazard in normal use.

### **Pesticide use in crop stage**

Largest number of farmers used pesticides in the early tillering stage (30%) followed by the late tillering and booting stages. Vegetative growth stage is the most susceptible to the pest attack, that's why farmers applied mostly in early and late tillering stages than the booting, flowering and milky stages. Major insect pests such as stem borer, leaf hopper and plant hopper attacks are prevalent in these stages. Rice hispa is one of the major insect pests of rice attacks in the mature stage like soft dough. In Bangladesh, rice hispa infestation is common and more than 12% of farmers applied insecticides in the soft dough stage. Ten percent farmers applied insecticides at the nursery stage which is susceptible to thrip, defoliator, stem borer, green leaf hopper and plant hopper.

### **Application methods**

About 57% farmers of Bangladesh use hand sprayer and 8% Knapsack sprayer to apply the pesticides on the crop field. Remaining 18% farmers use broadcast methods and 16% use other traditional methods. The sprayers they use are not in a good condition. The hand sprayer they use includes a container with broom and sprinkled the pesticide with broom. Most of the farmers don't have any sprayer of their own; they borrowed it from relatively richer farmers. They didn't have any training about the sprayer use and

precaution. Therefore, the spray is always associated with high risk of exposure. The farmers broadcast the granular insecticide keeping in an open bowl or basket and broadcast by bare hands and feet. The traditional methods they used are very unscientific. For example they brush the crop field. In this method, usually the insecticide is mixed with water in an open bowl or a big can then date palm leaf is soaked in it and the standing crop plant is brushed. During the mixing and brushing the farmers as well as the environment are exposed to pollution. No farmers use any protective measure such as mask or gloves. According to the pesticide agent and leaflet provided by the Department of Agricultural Extension, the measuring unit is being used as spoonful, handful or lidful.

### **Alternative methods used for pest control**

Because of late introduction of pesticide in Bangladesh agriculture the farmers are used to control pest using other traditional methods besides insecticide. In these cases they use indigenous knowledge to control pest not to avoid the hazard of pesticide, mainly to minimize the production cost. Among the other methods, 40% of the farmers use crop rotation as an alternative to chemical pesticides use, 19% use timely planting and 15% use resistant varieties. Only 2% of the farmers use Integrated Pest Management (IPM) technique to control pest of rice. Bio-controls means that they use bird to feed the insect. Remaining 12% farmers use other methods such as, soap, kerosene oil, light and net trap to control insect. In certain extent they pull the insect larvae by hand also.

### **Ecological impact**

- Many types of birds, fish and plant become extinct by the effect of highly toxic pesticide.
- Unbalance use of pesticide make the ecosystem worst.
- Many species of herbaceous plant of medicinal value extinct by the continuous use of highly toxic pesticides.
- Many fishes are caused by diseases by the pesticidal effect.

### **Impact on soil**

- Application of toxic chemicals in the crop field harms the earthworms, soil microbes which deteriorated soil fertility.
- Use of excessive pesticide accumulates in the soil which is responsible for soil toxicity.
- Many pesticides (such as, DDT, aldrin, heptachlor, dieldrin and chlordane) remain unchanged in the soil.

### **Impact on water**

- Long-term and heavy use of pesticides may pollute the aquatic environment through the contamination of unused portions of pesticides.
- Through irrigation water pesticides runoff to the rivers, canals, etc. and many fishes have been extinct by the effect of pesticides used in the crop field.
- Ground water is being polluted by pesticide leaching from crop field. Impact on air and health
- It is very dangerous for the applicator to be affected by the poisonous pesticides if not properly handled.
- Several diseases may be observed to be caused by pesticide used.
- During the pesticide spray the air is being polluted by spray drift which causes health hazard to the applicator neighbours.
- The granular insecticide used in the paddy field exposed to the air and pollute the surroundings.

### **Policies and Strategies**

According to 'The Pesticide Rules, 1985', all pesticide either manufactured or imported should be registered to the Authority. After submission for registration to the authority for approval, it is required to know by the authority about physical and chemical properties, efficacy data, toxicological data, residues and their fate in the environment. But in practice the assessment of environmental impacts or residue analysis is hardly undertaken due to the lack of expertise in the field as well as laboratory facilities.

In chapter II, section 8 of the Pesticide Rules, it is said that the certificate of registration may be cancelled but not mentioned when the certificate will be cancelled. Regarding import in chapter IV it is mentioned that 'No pesticide shall be imported through a route other than the recognized custom frontier stations of Bangladesh'. But huge amount of banned and highly toxic pesticides are being smuggled from India through the border. It has been reported by the Institute of Development Policy Analysis that the pesticide like Eldrin and Endrin are sold with different labels in Bangladesh. The suppliers continue to sell many chemical pesticides pro-scribed by the government, and 12 particularly controversial pesticides dubbed the 'dirty dozen' by activists campaigning worldwide to stop its manufacture.

There is a provision of licensing of the pesticide dealers for sale but it is not clearly stated what will be required for the qualification of the license holder, so anyone may get license. Therefore, it is found that the registered dealer also does not have any knowledge about the pesticide handling. The regulation said it could be duplicated and transferred to anybody. It is not said in the regulation that the sales dealer might have

training on pesticide. The main drawback of this regulation is in chapter VII section 33 sub-section I(a) which gives the provision to state the name of the manufacturer, formulate or repacked in the label even he/she is not the person in whose name the pesticide is registered. For this reason it is very difficult to identify the respective person for punishment. Therefore, taking the advantage of the weak point of regulation the illegal business of pesticide is going on and it is not uncommon that the violation of rules is taking place.

The environmental degradation linked to agriculture is the impact of toxicity from improper pesticide use. Pesticides are responsible for health hazard or food poisoning. Unjudicial use of pesticide makes the ecosystem vulnerable. It is not possible to produce crop without using pesticide in modern agriculture of competitive market. Therefore, crop pests can be controlled with the timely and balanced application of pesticides.

Considering the cropping intensity and toxicity of the pesticide, the environment and farmers health are at high risk under the pesticides contamination. Among the insecticides used by the farmers, Bashudin 10 G, Diazinon 60 EC, Sumithion 60 EC and Padan 50 SP have already been banned for use on rice in other developing countries. The use and availability of Bashudin, an obsolete pesticide indicates that existing pesticide laws and regulations are not strictly enforced in relation to import, formulation, repackaging, distribution, advertising and use of pesticides. Therefore, in Bangladesh the laws and regulations of pesticide should be enforced more strictly.



# 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 Paurashava Act needs to be revised and more power should be given to the Executive Officer for appointment of employees.

It cannot be virtually function effectively as a Paurashava under such a stringent financial condition. To function, effectively, it must raise its revenue earning. But it is reported that the Paurashava cannot collect all its holding tax from the citizens. Holding tax is the most important source of its own revenue earning. It must take care to ensure 100% recovery of holding tax. The Paurashava cannot function effectively depending upon government

grant only. The existing manpower position of the Engineering, Development control and Accounts should be substantially raised to handle future volume of work. Moreover, additional staff especially for the implementation of Master Plan will soon be required.

The present plan package imposes a large number of development projects on Kalkini 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 Kalkini 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 Lack of Paurashava Town Planning Capacity**

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

##### **9.1.3.1 Institutional Framework**

To rearrange the institutional framework for the Paurashavas recently the government has made a committee to reform the organogram of all the Paurashavas of Bangladesh. According to the clause no. 72-78 (Paurashava Officer & staff, provident fund etc) of Paurashava Act, 2009 and on the basis of the type and category of works, the committee suggested appropriate section/units/divisions within the Paurashava framework.

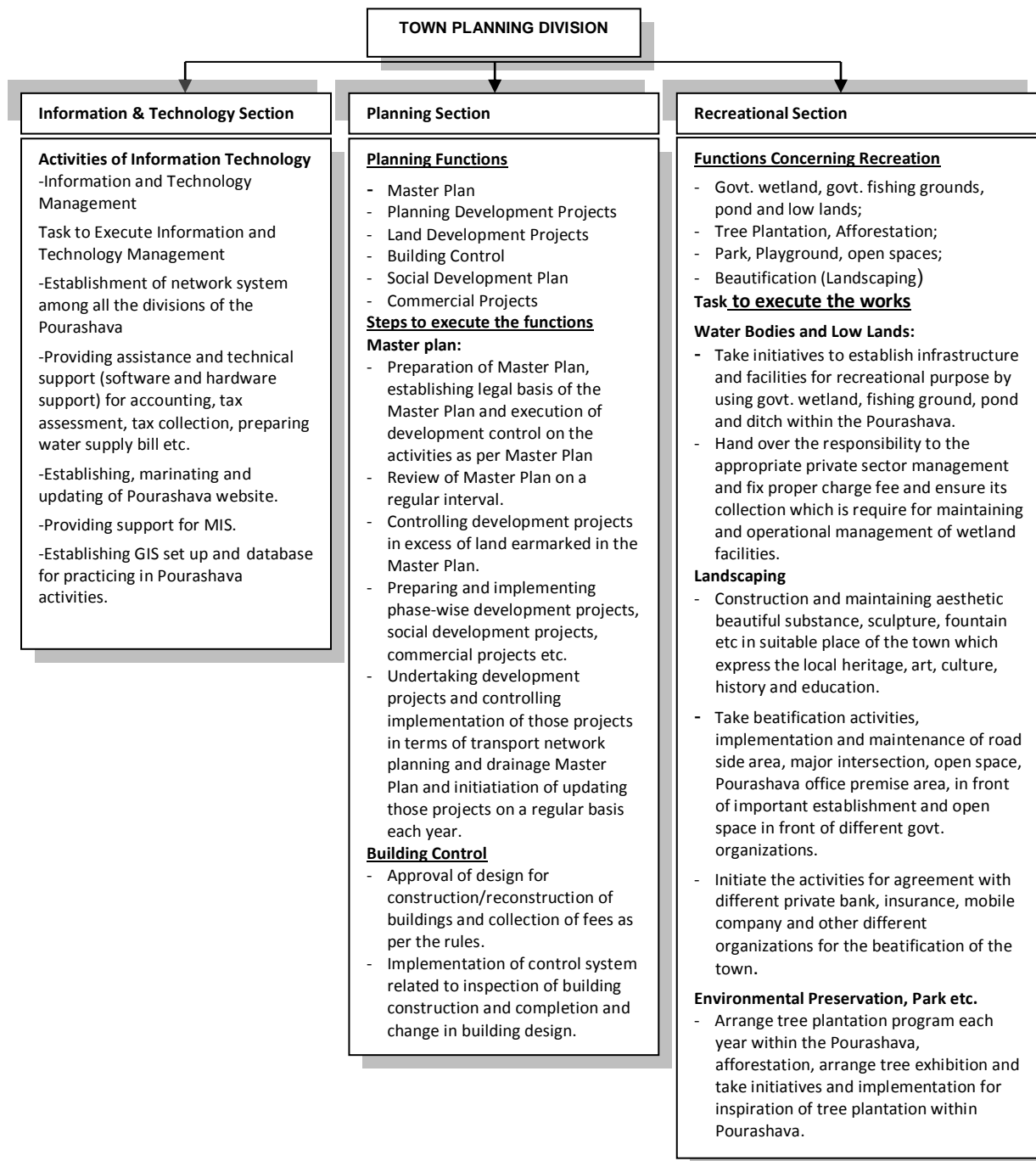
Planning unit or division will be necessary to set sequentially as the authority can perform its mandatory responsibility 'town development and control' well and serve the inhabitants presently as well as in the future. The planning unit/division may have some sections that are as follows:

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

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



**Figure 9.1: Scope of Work for Planning Division**



#### **9.1.3.2 Lack of Paurashava Town Planning Capacity**

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

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

#### **Support for Planned Urbanization**

For creating planned urbanization, Paurashava may:

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

#### **Community Mobilization Program**

Following are the community mobilization support activities:

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

### **Urban Governance Improvement Action Programme (UGIAP)**

- It is stipulated in the 6th 5 year plan 'the Key constraints to the effective functioning of the Paurashavas and City Corporations are unclear mandate and service responsibilities; lack of accountability; weak finances and financial autonomy; poor coordination and control among service agencies and weak management'.
- To overcome the challenges, the 6th Five year plan as well as Perspective Plan of Bangladesh, 2011-31 recommends the same issues mentioned below:
- the instructional reform and decentralization of responsibilities and resources to local authorities; participation of civil society including woman in the design, implementation and monitoring of local priorities; building capacity of all actors (Institutions, groups and individuals) to contribute fully to decision making an urban development process; and facilitate networking at all levels.
- It is already tested, proven and accordingly recognized in the 6th Five year plan that urban infrastructure improvements have been proved very successful introducing governance and performance-based approach adapted by UGIIP in selected ULBs in the country. Among other suggestions the 6th Five year plan also includes nature for Urban Governance Improvement Action Programme (UGIAP) and Capacity Building of Institutes at Municipality-level in particular.

### **Citizen Awareness and Participation**

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

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

### **Urban Planning and Environmental Improvement**

- Master plan is a guideline and detail urban planning activities are being prescribed in the plan. To produce a livable environment in the Paurashava premises, following initiatives should be taken:
- Recruitment of staffs and establish Planning Department related to administrative structure, meeting and meeting minutes preparation.

- Master Plan, Base Map verification and update landuse plan preparation.
- Approval of building plan and development control.
- Introduction of environment and public health activities.

### **Urban Poverty Reduction**

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

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

### **Income Generating Activities**

The income generating activities include:

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

### **Transparency and Accountability**

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

- Administrative Reformation of Paurashava.
- Set Vision, Mission and functions for each department / section of the Paurashava.
- Functions to be decentralized, transfer and coordination with other authorities.

- Establishment of Capacity Development Committee in Paurashava-level.
- Establishment of Urban Information Services Center at Paurashava premises.
- Meet the Mass people of Paura-Parishad.

#### **9.1.4 Legal Aspects**

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

#### **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 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 Paurashava Ordinance 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 Kalkini 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.

Under different Government Projects computer and accessories are supplied for automation of the accounts system of Paurashavas within Bangladesh. Besides, trainings are also offered to the Paurashava account staffs for enabling introduction of automation in accounts system. But Kalkini Paurashava has not yet been enlisted under any kind of these projects.

### **Revenue Management**

The Paurashava still follows a traditional management system in tax collection and revenue management. 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. Tax automation system is not established here yet. The public is mainly informed about tax collection during the presentation of annual budget. They may, however, get information from the councilors 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 will have been supplied and installed in the Paurashavas covered by different projects. The projects also provided training to the relevant staff 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 from paying bribe, and experiencing hassle.

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

#### **9.1.7 Monitoring, Evaluation and Updating**

An important step for implementation of the Plan is land use clearance. Land use clearance will be needed for every physical component whether it may be public or private. The Paurashava will provide such clearance. To ensure the future development according to the proposals prescribed in the Urban Area Plan and Ward Action Plan, the Paurashava must maintain the following guidelines during the land use clearance.

**Must ensure 20 ft. access road for any type of land use clearance.**

No permanent land use should be allowed in the area demarcated as urban reserve and the authority will follow the guideline provided to Annexure- A when the will provide land use clearance.

Must ensure that no land use clearance is issued on the lands indicated as road, drainage channel, water reservoir, educational institution, health services, open space, fruit garden / orchard in the Urban Area Plan.

Monitoring and evaluation is a very important part of plan implementation. Monitoring helps check if the plan is being implemented properly. It also measures the level of implementation of the plan. If the plan implementation is not on track, corrective measures can be taken to put 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 Kalkini 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 Kalkini 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 piece-meal. It is unfortunate that town planning has not yet become a part of our urban development culture. Individuals develop lands and construct buildings with a little respect for planned development, and the concerned authority is also unable to exercise full control on development. Some strict measures are necessary to make stakeholders follow up plans and development rules. Awareness is to be built among the people to follow the Master Plan provisions and plan. Government agencies must be compelled to follow plans. Existing laws in this regard must be updated incorporating provisions of plan execution.





## **PART B**

### **URBAN AREA PLAN**

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

The Terms of Reference (TOR) specify (Pg. 6. Article 4) that the Urban Area Plan (UAP) / Multi-sector Investment Plan (MSIP) will consist of the following plans:

- Landuse Plan
- Transportation and Traffic Management Plan
- Drainage and Environmental Management Plan
- Plan for Urban Services

The Urban Area Plan is presented in both, map and textual format. The plan map is presented in 1:1980 scale, super imposed on latest cadastral/revenue map having plot boundaries within mouzas. The plan is accompanied by an explanatory report supported by necessary figures, maps and data.

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

The outline of the Urban Area Plan gives guidance to the Paurashava as to how it can develop the roles i.e. to promote development, to co-ordinate development and to control development.

The Urban Area Plan has been divided into four main parts. These are preceded by four introductory chapters which explain the scope of the report and provide background to the Urban Area Plan including its relationship with the Structure Plan.

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

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

Drainage and Environmental Management Plan is the third chapter of the Urban Area Plan. The chapter again subdivided into two parts – drainage part and environment part. Existing drainage network, land level and topographic contour, plan for drainage management and flood control and plan implementation strategies are the components of the drainage part. Existing environmental condition, solid waste and garbage disposal, environment pollution, water-logging, natural calamities and localized hazards, plan for environmental management and pollution control and plan implementation strategies are the key issues of the environment part.

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

The Urban Area Plan of the Kalkini Paurashava covers an area of 7473.20 acres (30.30 sq km.). The reason behind choosing such area lies in fact that this is the most urbanized part of the Paurashava, where there is still scope and possibility of urban development in near future. Paurashava operates all parts where it provides basic urban services and facilities. Considering future urbanization trend and potential development projected population is assumed 64125 for 2031.

The Urban Area Plan covers nine Ward Action Plans also.

# CHAPTER 10

## 10. LAND USE PLAN

### 10.1 Introduction

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

### 10.2 Existing and Projected Landuse

#### 10.2.1 Existing Landuse

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

In Kalkini Paurashava, major landuse is agriculture (69.80%). Residential landuse occupies second position (15.90%) of the category. Only 0.98% land is using for circulation network. Though, agriculture landuse dominates the Paurashava but, after the preparation of Master Plan, a radical change in physical development will proceed. In consideration of such concept, the Master Plan will be delighted in favour to save the agriculture land.

**Table 10.1: Existing Land use of Kalkini Paurashava**

Landuse category	Total	Total (%)
Agriculture	5218.61	69.80
Circulation Network	73.30	0.98
Commercial	102.55	1.37
Community Service	77.52	1.04
Education and Research	41.61	0.56
Government Services	37.13	0.50
Industry	42.69	0.57
Mixed Use	7.37	0.10
Non-Government Service	14.74	0.20
Recreational Facility	2.40	0.03
Residential	1186.46	15.90

Landuse category	Total	Total (%)
Service Activity	14.21	0.19
Transportation and Communication	5.18	0.07
Water body	649.44	8.69
Total	7473.20	100

Source: Land Use Survey, 2010.

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. The Paurashava was developed as a growth centre long before, than a police station. In the year 1997 it is notified as Paurashava. Radical change of landuse in the Paurashava is not found. Before it known as Paurashava, agricultural domination was the key landuse. During last ten years, the landuse scenarios remain same. A stagnant character of landuse change still stand due to the existence of river named Palardi and Arialkha. Rapid change of landuse will be viewed after the construction of Padma Bridge at Maowa point.

### 10.2.2 An Estimate on the Requirement of Land

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

Projection of landuse depends on the growth of population. After population projection it is found that, population of this Paurashava will be 53973 in the year 2021 and 64125 in the year 2031. Projection on landuse also depends on present trend of migration.

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

The standards presented in the Table-10.2 are fairly generous and considered for the Paurashava (including extended areas). Adjustments have to be made in the core areas and a time line may be set to gradually achieve these standards over a five, ten and fifteen years period.

## Commerce

In total, 28 acres commercial land is in the Paurashava.

**Determination of Standard:** According to the standard on Wholesale Market/ bazar, 1 acre land is to be provided for every 10,000 populations and 1 acre land for every 1000 population for Retail sale market. Again, 0.25 acre of land is being standardized for per corner shop, 1 acre per neighbourhood market, 1.5 to 2.5 acre per super market and 1 acre per 25,000 populations for bank, hotel, garage and godown. The study team has considered 48489 populations for the study area up to the year 2031. For this population total number of required wholesale market/bazar stands at  $(48489 / 10,000)$ , means 4.82 acres land is being needed up to the year 2031 and for retail sale market, 48.19 acres. The planning area already has 7 retail sale market including wholesale market/bazar and a Paurashava 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 Paurashava. The lands may be allowed to use for other commercial purposes like bank, hotel and godown.

## Industry

In the Paurashava, 3.22 acres land is under industrial development.

**Determination of Standard:** According to the standard, land is being allocated as 1.5 acres for every 1000 populations in case of small-scale industry, 5 acres per 10000 populations for heavy industry and service industry and 1 acre per 1000 population for cottage/agro-based industry. The study team has estimated 48489 populations for the planning area up to the year 2031. For this population total required land for industry stands at  $(48489 / 1,000)$ , means 48.19 acres land for small-scale industry, 72.3 acres for cottage / agro-based industry and 25.17 acres each for heavy industry and service industry (including agro-based industry), up to the year 2031.

**Recommendation / Forecast:** The study team recommends planned formation including grouping of industries on different locations. Necessary planning permission will be followed by the Paurashava. The lands, however, should not be allowed to use other than industry. The industries which are located dispersely should be accommodated within the prescribed industrial areas.

### Primary School

**Determination of Standard:** According to the standard on primary school, 1 school with 2 acres of land is to be provided for every 5,000 population. The study team has estimated 53973 populations for the planning area up to the year 2021. For this population total number of required primary school stands at  $(48489 / 5,000)$ , means 5 schools with 9.69 acres land will be needed up to the year 2031. The planning area already has 28 primary schools with an area larger than the projected area. No new primary school is required.

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

### Secondary School

There are 6 secondary schools in the planning area covering together 1.93 acres land. Average area of a secondary school is 0.32 acre.

**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 48489 up to the year 2031. Therefore, as per standard the planning area needs  $(48489 / 20,000)$ , means 2.42 acres land will be needed for secondary school up to the year 2021. At present, there are 6 secondary schools with 1.93 acres of land in the planning area. Number of schools already exceeds the requirement.

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

### College / Higher Secondary School

There is one college in the planning area. The existing college is located on 4.9 acres of land.

**Determination of Standard:** The standard for college is 10 acres per 20000 populations.

**Recommendation / Forecast:** The planning area already has one degree level college apart from higher secondary level education is in several high schools. Therefore, no recommendation for new college is prescribed but, vertical expansion of the existing college is required.

### Vocational Training Centre

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

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

**Recommendation / Forecast:** The study team recommends a vocational training centre on 5.0 acres land. Necessary planning permission will be offered by the Paurashava. The lands, however, should not be allowed to use other than vocational training centre.

### Health Facilities

At present, seven health establishments are in the Paurashava. Three hospitals, two clinics and two diagnostic centers are those establishments. The health facilities covered 14.21 acres of land.

**Determination of Standard:** The prescribed standard for health facilities are 10 to 20 acres for Upazila Hospital and 1 acre per 5000 population for Health centre/Maternity clinic. According to the standard, up to the year 2021, (48489 / 5000) means 9.69 acres of land will be needed for Health centre/Maternity clinic.

**Recommendation / Forecast:** The study team recommends expansion of present Upazila Hospital on earmarking land and some health services where the land owners will develop such services. Necessary planning permission will be offered by the Paurashava. The lands, however, should not be allowed to use other than health services.

### Open Space

At present, no open spaces in the Paurashava.

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

**Recommendation / Forecast:** The study team is not recommended play field. At least one park is being recommended with an area 48.19 acres depending on availability of open land. Park with restaurant may be constructed on the land situated on the riverbank. Community forest and tourism development also prescribed without considering any standard. Amount of land for those components have been considered through discussion with the stakeholders.

### Community Facilities

Community facilities include Community centre, Graveyard/Burial ground, Electric sub-station, Water supply pump, Post office, T&T office, Public library, Eidgah, Mosque/Church/Temple, Police station, Police box/outpost, Fire service station, Waste disposal site, club, etc. Existing land under community facilities is 25.4 acres.



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

**Recommendation / Forecast:** The study team recommends a new community centre on 0.50 acres of land. Areas for Mosque/Church/Temple, Post office, Fire service station and T&T remain with existing areas.

### **Administration**

In the Paurashava, 9.6 acres land is under administrative use.

**Determination of Standard:** According to the standard for administrative land, 15 acres of land is to be provided for every Upazila, 3 to 5 acres per Paurashava office, 0.10 acres per Union and 10 acres for jail/sub-jail. Total required land for administration stands at 18 acres. New administrative land will be needed and it is being proposed.

**Recommendation / Forecast:** The planning area already has one Upazila office, one Paurashava office and other govt. offices. Therefore, no recommendation for new administrative area is prescribed but, vertical expansion of the existing administrative offices is required.

### **Recreation**

Only 2.40 acres land is under recreational use in the Paurashava.

**Determination of Standard:** According to the standard for recreational facilities, 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 shishu park. The study team has estimated 48489 populations for the planning area up to the year 2031. For this population total land required for cinema / theatre stands at  $(48489 / 20,000)$ , means 2.42 acres of land is being needed up to the year 2031, 5 acres for stadium and 48 acres for shishu park.

**Recommendation / Forecast:** The study team recommends a stadium/sports complex on 6.0 acres of land.

**Table 10.2: Existing and proposed landuses including standard**

Types of Land Uses	Recommended Standard Provision (unit)	Existing (acre)	Estimated Land (acre)				Proposed (acre)
		2011	2016	2021	2026	2031	2031
<b>Residential</b>		1186	1081.00	1123.00	1167.00	1212.00	1451
General residential	40 persons/1 acre		1081.00	1123.00	1167.00	1212.00	1451
Real Estate–Public/Private	200 population/ 1 acre						
<b>Roads</b>		73.3	116.2	150.18	175	200	239
-Paurashava primary roads	150 -100 feet						
-Paurashava secondary roads	100-60 feet						
Paurashava local roads	40 20 feet						
<b>Education</b>		29	58.55	60.7	62.91	65.25	57.19
-Nursery	0.5 acre/10,000 population		4.28	4.46	4.63	4.82	
-Primary School/ kindergarten	2.00 acres/5000 population		17.14	17.82	18.53	19.28	
-Secondary/ High School	5.00 acres /20,000 population		10.71	11.14	11.58	12.05	
-College	10.00 acres/20,000 population		21.42	22.28	23.17	24.10	
-Vocational Training Centre	5 - 10 acres / Upazila		5.00	5.00	5.00	5.00	
<b>Open Space</b>		13.46	99.25	103.02	106.94	111.02	108.7
-Play field/ground	3.00 acres/20,000 population		6.43	6.68	6.95	7.23	
- Park	1.00 acre /1000 population		42.84	44.55	46.34	48.19	
-Neighborhood park	1.00 acre /1000 population		42.84	44.55	46.34	48.19	
-Stadium/ sports complex	5 – 10 acres/Upazila HQ		5.00	5.00	5.00	5.00	
-Cinema/ Theatre	1.0 acre /20,000 population		2.14	2.23	2.32	2.41	
<b>Health</b>		9.5	8.57	8.91	9.27	9.64	9.19
-Upazila health complex/ hospital	10 -20 acres/Upazila HQ						
-health centre/ Maternity clinic	1.00 acre/ 5,000 population		8.57	8.91	9.27	9.64	
<b>Community Facilities</b>		25.4	10.71	14.64	15.08	15.55	39.74
-Mosque/Church/ Temple	0.5 acre /20,000 population		1.07	1.11	1.16	1.20	
-Eidgah/	1.0 acre/20,000 population		2.14	2.23	2.32	2.41	
- Graveyard	1.00 acre /20,000 population		2.14	2.23	2.32	2.41	
-Community centre	1.00 acre /20,000 population		2.14	2.23	2.32	2.41	
-Police Station	3 – 5 acres/Upazila HQ		0.00	3.00	3.00	3.00	
-Police Box/ outpost	0.5 acre/ per box		0.00	0.50	0.50	0.50	

Types of Land Uses	Recommended Standard Provision unit)	Existing (acre)	Estimated Land (acre)					Proposed (acre)
		2011	2016	2021	2026	2031	2031	
-Fire Station	1.00 acre/ 20,000 population		2.14	2.23	2.32	2.41		
Post office	0.5 acre /20,000 population		1.07	1.11	1.16	1.20		
<b>Commerce and Mixed</b>		28	50.88	52.76	54.72	56.76		53
-Wholesale market	1.0 acres/ 10000 population		4.28	4.46	4.63	4.82		
-retail sale market	1.0 acres/ 1000 population		42.84	44.55	46.34	48.19		
-Corner shops	0.25 acre/per corner shop		0.25	0.25	0.25	0.25		
- neighborhood market	1.00 acre/per neighborhood market		1.00	1.00	1.00	1.00		
-Super Market	1.50 – 2.50 acres/per super market		2.50	2.50	2.50	2.50		
<b>Industry</b>		3.22	107.10	111.39	115.84	120.48		83
-small scale	1.50 acres /1000 population		64.26	66.83	69.50	72.29		
-cottage/agro-based	1.00 acres /1000 population		42.84	44.55	46.34	48.19		
<b>Transportation</b>		1.6	3.96	4.09	4.23	4.36		4.48
-Bus terminal	1.0 acre /20,000 population		2.14	2.23	2.32	2.41		
-Truck terminal	0.50 acre /20,000 population		1.07	1.11	1.16	1.20		
-Baby taxi/tempo stand	0.25 acre /one baby taxi/tempo stand		0.25	0.25	0.25	0.25		
-Rickshaw/van stand	0.25 acre /one baby taxi/tempo stand		0.25	0.25	0.25	0.25		
-Passenger Shed	0.25 acre /one baby taxi/tempo stand		0.25	0.25	0.25	0.25		
<b>Administration</b>		9.6	18.00	18.00	18.00	18.00		20.39
-Upazila complex	15.00 acres		15.00	15.00	15.00	15.00		
-Paurashava office	3 – 5 acres		3.00	3.00	3.00	3.00		

## Residential

Existing residential areas of the Paurashava is 1186.46 acres. All type of residential lands is included with such amount of land. About 88% residential land belongs with the rural homestead. Therefore, rural environment will be considered for creating better living areas.

**Determination of Standard:** The standard recommends in Table-10.2 is 40 persons per acre (gross). Again, it is recommended 200 persons per acre for real estate or housing areas both for public and private. No standard is being recommended for low-income group.

**Recommendation / Forecast:** According to the standard (40 persons per acre), 1212 acres land will be needed up to the year 2031. Allocation of residential land for future is 1414 acres (both residential and rural settlement). The Consultant recommends one row housing area for flood victims. The row houses may be constructed on the western part of the Ward No. 3, adjacent to the river. Mostly khas land will be preferred for such development and it should not be above 10 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. 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.

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

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

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

#### 10.3.1 Designation of Future Landuse

- Identification and development of sites for government housing. After preparation and implementation of the master plan, different types of government activities will be increased. Residential accommodation will be needed for those government employees. A site for government housing should be reserved. National Housing Authority is appropriate for performing this responsibility.
- Encourage central government to decentralize industrial development from Dhaka. Those facilities may be relevant with specific agro-product such as jute for jute industry, cane and bamboo for handicrafts, poultry and horticulture farming, export-oriented vegetation, etc. Different authorities such as Agriculture Development Corporation, Small and Cottage Industries Corporation, Directorate of Livestock and Poultry may be the responsible authority.
- Provision of sites and services schemes for the low and lowest income groups. The Paurashava authority and Schedule Bank may be appropriate for performing these responsibilities. Housing for low-income group, distribution of khas land among the

lowest-income group and loan with low-interest for house construction may be the appropriate schemes.

- Upgrading of slum and squatter settlements. Mostly, the vulnerable groups are affected by river erosion, form slum and squatters on public land. If possible, those formations should be upgraded providing basic utility services. It is better, in Paurashava context, the people are living in the slum and squatters, rehabilitate them with the provisioning of housing for lowest-income group. The Paurashava and NGOs can perform such role.
- Location for new industrial development. The industrial area prescribed in the Landuse Plan will be developed provisioning all utility services. The authorities relevant with those utility services will perform the responsibilities. At first, the polluting industries (water and noise) from their original location should shift to the new location. Imposition of taxes, tax holiday and subsidized taxes may be imposed by the Paurashava for such rearrangement.
- Monitoring the principal aspects of community facility provision in the Paurashava. Wholesale or retail market, specialized clinic, etc. are under this community facility. When any difficulties will be encountered in case of suitable site selection considering demand of the inhabitants, the Paurashava will perform the lead role.

#### **10.3.2 Landuse Zoning**

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

##### **Area / Use Zoning**

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

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

##### **Density / Bulk Zoning**

Aim of the density zoning is to provide an acceptable density which is related to the designed facilities and amenities especially for the residential areas. This will ensure a

healthy community and enjoyable community life. In a particular area, how much number of buildings will be permitted and constructed, the decision is under the density zoning. Provisioning of setback rule and percent of land uses for different purposes is the prime consideration of density zoning. The proposed percentage mentioned in the landuse table is the only tool to control building density in the Paurashava.

### **Height Zoning**

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

For effective development control, in addition landuse zoning individual facility and the structures therein is complied certain regulations imposed to ensure desirable end. Relation between ground cover of buildings and the land parcel that house it, minimum setback of building from the adjoining plot boundaries and the maximum floor area that can be constructed in relation to plot size and the connecting road among many other details, are controlled by Building Construction Rules, 1996. Besides, Bangladesh National Building Code focuses on the appropriate materials, construction method, building safety and associated issues. In absence of Paurashava Master Plan the above rules did not have scope for area specific rules and hence were common for the whole development process.

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

#### **10.3.3 Classification of Land Use Zoning**

After a detailed consultation with the LGED counter-part, the land use classification for the Paurashava Master Plan is being finalized as shown in the Table-10.4. Map 10.2 and Appendix -2 shows the Land Use Plan of the Kalkini Paurashava.

**Table 10.3: Landuse Plan of the Kalkini Paurashava according to the zone**

SL.	Land use Category	Remarks	Area (acre)	%
1	Urban Residential Zone	Urban Residential area is a land use in which housing predominates. These include single family housing, multi-family residential, or mobile homes. Zoning for residential use may permit some services or work opportunities or may totally exclude business and industry. It may permit high density land use.	806.06	10.79
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. Aiming to control the growth in this zone, less service and facilities will be provided.	650.22	8.70
3	Commercial Zone	The land used for commercial activities is considered as commercial land use. These activities include the buying and selling of goods and services in retail businesses, wholesale buying and selling, financial establishments, and wide variety of services that are broadly classified as "business". Even though these commercial activities use only a small amount of land, they are extremely important to a community's economy. Commercial land includes established markets and areas earmarked for markets.	32.55	0.44
4	Mixed Use Zone	Mixed land use refers to the area without a dominant land use (Residential, commercial, industrial etc.).	21.34	0.29
5	General Industrial Zone	Green and Orange A categories as per The Environment Conservation Rules, 1997	43.32	0.58
6	Heavy Industrial Zone	Other toxic and pollutions Industries (Orange B and Red categories as per The Environment Conservation Rules, 1997)	40.17	0.54
7	Government Services	All Government Offices except large scale service based offices as Civil Surgeon Office, DC Office, Police Box, Police Fari, Police Station, LGED Office, Paurashava Office, Settlement Office, Union Parishad Office, Upazila Headquarter, BADC Office, Fisheries Office, Ansar/VDP Office, Agriculture Office, Zila Parishad Office, Post Office, Telephone Exchange Office and Other Government Offices.	20.53	0.27
8	Education & Research Zone	All kinds of educational institutes like Primary / secondary / other Schools / Colleges etc are mentioned to calculate the land use for education and research purpose.	57.39	0.77
9	Agricultural Zone	Agricultural land denotes the land suitable for agricultural production, both crops and livestock. It is one of the main resources in agriculture. It includes productive land (single, double and triple cropped), seed bed, fisheries, poultry farm, dairy farm, nursery, horticulture etc.	4750.18	63.56
10	Water body	Equal or More than 0.25 acre and justification by the consultant and wet land will merge with water body	564.35	7.55
11	Open Space	Playground, Botanical Garden, Stadium, Zoo etc. (Facilities without or with minimum building structure)	130.47	1.75
12	Recreational Facilities	Facilities other than those mentioned to Open Space and indoor based facilities with designated building structure i.e. Cinema Hall, Theater Hall etc.	0.89	0.01
13	Circulation Network	Road and Rail communication	237.10	3.17
14	Transportation Facilities	Under transport and communication land use both transport and communication services are considered. This category includes airport, bus terminal/stand, ferry ghat, filling station, garage, launch terminal, post office, passenger shed, telephone exchange, ticket counter, transport office etc.	4.93	0.07

SL.	Land use Category	Remarks	Area (acre)	%
15	Utility Services	Utility services include Overhead Tank, Power Office/Control Room, Public Toilet, Sewerage Office, Waste Disposal, Fire Service, Water Pump House, Water Reservoir, Water Treatment Plant, etc.	5.01	0.07
16	Health Services	This land will be used to provide health facility.	9.34	0.12
17	Community Facilities	All community facilities including funeral places and other religious uses.	39.14	0.52
18	Historical and Heritage Site	The entire mentionable historical and heritage site.	Not applicable	
19	Restricted Area	A Restricted Area is an area where no one but certain people can enter. Here the areas which are not accessible for the general public except some high ranked personnel are considered as restricted area.	Not applicable	
20	Overlay Zone	If the consultant justifies any area that should not be defined as other given definitions but the facility(s) may not be avoidable, they may use this category.	Not applicable	
21	Urban Deferred	Optional, depending on the Paurashava and the Consultant's judgment	60.16	0.81
22	Forest	Designated Forest Area.	Not applicable	
23	Beach	Sea Beach	Not applicable	
24	Non Government Services	Any other categories which are not related to above 23 categories.		
Total			7473.20	100

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

### Urban Residential Zone

Urban residential zone refers to all categories of urban residential areas, including exiting and proposed residential land. In total, this zone covers 806.06 (10.79%) acres of land delineated up to the year 2031, considering standard provided by LGED. Urban residential zone refers to all categories of urban residential areas, including exiting ones and the residential land use proposed under the present Master Plan. Potential area for high dense residential area near to urban core area (influences of close proximity to commercial hub, administrative, educational facilities, road way network, service facilities and flood free suitable land for development) and large portion area both side of Dhaka-Barisal via Bhanga area demarcated as such kind of use.



### **Rural Settlement**

Kalkini Paurashava includes some rural characteristics. The Land use category supplied by LGED for identification of residential settlements in the agricultural belt is categorized as rural settlements. These settlements usually constructed with temporary building materials. Kalkini Paurashava is mostly rural in character. About 73% existing land is under agriculture practice and most of the settlement situated surrounding or within the agricultural land. In planning consideration, to save agriculture land according to the Agriculture Policy of Bangladesh, a portion of land declares as rural settlement. This settlement occupies 650.2 acres of land (8.7% of the total land). The areas of rural settlement have some restrictions for non-agricultural development. Annexure-B shows the permitted land use of rural settlement.

### **Commercial Zone**

The commercial zone is intended to provide locations, where commercial activities including retail and wholesale can be set up and function without creating hazards to surrounding land uses. As per planning standard, it requires 56.7 acres land for commercial activity. In the Paurashava, commercial land is proposed 32.55 acres and others land proposed for mixed use. So that the land can be used for both residential and commercial purposes. It is not possible to reduce / convert those commercial lands in to other uses. Therefore, it is suggested that the existing commercial area will remain up to the year 2031.

### **Mixed-Use Zone**

Mixed-use zone is recommended to allow some flexibility in development. In a small urban area like Kalkini, 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 proposed area for mixed-use is 21.34 acres (0.3% of total area) including existing and proposed use. This zone will allow residential structures together with commercial uses as listed in Annexure-B.

Ward Center will treat as the hub of local civic functions and it will provide the following facilities as per the requirements of the locality:

- Counselor office
- Community Center
- Community Clinic
- Post Box
- Small shops

- Club
- Office of Utility Services

### **General Industrial Zone**

Industrial/Manufacturing/Processing Zone intends to provide locations, where Orange B and Red categories (as per Environmental Conservation Rule, 1997) industrial, manufacturing and processing.

Establishments can be setup and function without creating hazards to surrounding landuses. Due to the availability of gas facilities and well road connection by Dhaka-Barisal highway and availability of land creates scope industrial development in the Paurashava. Total proposed area for general industrial is 43.32 acres (0.58% of total area) including existing and proposed use. Since there is no industrial agglomeration in the Paurashava, the industrial zone will mean for new industries. In this zone, a complex line of industrial and supporting non-industrial land uses will be permitted as per Annexure-B.

### **Government Services**

Administrative zone covers all kinds of government and non-government offices. Permitted uses in this zone is presented in Annexure-B. Total area under this use has been estimated as 20.53 acres that include existing and proposed land uses. This land will be used for established Paurashava office and other administrative uses as prescribed in the plan.

### **Education and Research Zone**

Education and Research zone refers to mainly education, health and other social service facilities as listed in Annexure-B. Total area under this use has been estimated as 57.19 acres and proposed (57.39 acres) uses.

### **Agricultural Zone**

The Paurashava has a vast area of agricultural land that demands formation of a separate zone like agriculture. Agriculture zone primarily mean for agriculture and agriculture-related functions. Detail land uses is presented in the Annexure-B. Total area under this use has been estimated as 4750.18 acres that include existing and proposed uses.

### **Water Body and Retention Area**

Total 565.8 acres water body (7.57% of total land) is in the Paurashava. The plan suggests preserving most of those water bodies for two purposes, first, to serve as source of water, second, to serve as water retention area during monsoon. The ponds with an area equal to or more than 0.15 acres will be preserved as the water retention ponds. There will be permitted uses in this zone as stated in Annexure-B.

### **Open Space**

This zone has been provided to meet the active and passive recreational facility needs of the people and at the same time, conserve the natural resources. Total area estimated for this zone is 108.7 acres (1.45%). Details of permitted and conditional permits have been presented in Annexure-B.

### **Recreational Facilities**

This zone has been provided to meet the active and passive recreational needs of the people. Details of permitted and conditional permits have been presented in Annexure-B. Cinema hall, auditorium, gymnasium, etc. is being considered as recreational facilities. Total area proposed for this zone is 0.88 acres.

### **Circulation Network**

The road network is considered as circulation network. National highway, regional highway, local road whether pucca/semi-pucca/katcha, footpath, flyover, over-bridge, underpass, bridge, culvert, etc. are being included in circulation network. In total, 239.05 acres land covers (3.2% of total planning area) as circulation network. Details are given in Chapter 11, Part B of this report. At present, 73.30 acres land (108.30 km.) is under circulation network.

## **Map 10.1: Existing Landuse**



**Map 10.2: Landuse Plan of Kalkini Paurashava**



**Table 10.4: Development Proposal**

Proposed Facility	Ward Name	Mouza Name	Plot No	Phasing	Acres
Proposed Shoshan Ghat 01	Ward No. 03	Char Fathebahadurpur (424_05)	3725, 3728, 3729	2 <sup>nd</sup> Phase	0.170
Proposed Shoshan Ghat 02	Ward No. 02	Char Pangshya (293_00)	409	2 <sup>nd</sup> Phase	2.5
Proposed Overhead Tank	Ward No. 02	Char Thangamara (292_01)	409, 1520-24, 1534	3 <sup>rd</sup> Phase	1.599
Proposed Cow Market	Ward No. 02	Char Thangamara (292_01)	409	2 <sup>nd</sup> Phase	1.89
Proposed Graveyard 01	Ward No. 08	Uttar Janardandi (070_00)	75-78, 81-84	1 <sup>st</sup> Phase	6.07
Proposed Graveyard 02	Ward No. 01	Pangashia (079_02)	1011	1 <sup>st</sup> Phase	0.918
Proposed Stadium	Ward No. 08	Dakshin Janardandi (067_01)	23-26, 28, 29, 32, 33, 36-43, 45, 46, 91-100	3 <sup>rd</sup> Phase	13.47
Proposed Dumping Ground	Ward No. 09	Puali Madaripur (043_00)	23-25, 27-37	1 <sup>st</sup> Phase	2.9
Proposed Bus Terminal	Ward No. 09	Dakshin Gopalpur (044_00)	394, 395, 389	2 <sup>nd</sup> Phase	1.22
Proposed Truck Terminal	Ward No. 09	Gopalpur (045_00)	193,196-97	2 <sup>nd</sup> Phase	2.56
Proposed Auto Stand	Ward No. 01	Pangashia (079_01)	96	2 <sup>nd</sup> Phase	0.048
Proposed Slaughter House	Ward No. 01	Mazidbari (042_00)	93-95	2 <sup>nd</sup> Phase	0.371
Proposed Women College	Ward No. 01	Rajdi (078_02)	1013-15, 1017, 1018, 1020, 1021, 1077	3 <sup>rd</sup> Phase	2.451
Proposed College	Ward No. 09	Paschim Minajdi (066_02)	530-36	3 <sup>rd</sup> Phase	6.12
Proposed High School	Ward No. 06	Lakhimipur Pakhara (092_00)	542-45	3 <sup>rd</sup> Phase	1.108
Vocational Training Center	Ward No. 06	Lakhimipur Pakhara (092_00)	432-34,522-34	3 <sup>rd</sup> Phase	3.67
Proposed Park 01	Ward No. 07	Jhautala (086_00)	192-204	1 <sup>st</sup> Phase	7.17
Proposed Park 02	Ward No. 08	Uttar Janardandi (070_00)	27-50	1 <sup>st</sup> Phase	14.0
Proposed Children Park	Ward No. 02	Char Pangshya (293_00)	409	1 <sup>st</sup> Phase	3.47
Proposed University	Ward No. 04	Char Jhautala (087_00)	109-121,134-39	3 <sup>rd</sup> Phase	8.85
Proposed Playground 01	Ward No. 01	Pangashia (079_01)	142-49	3 <sup>rd</sup> Phase	1.006
Proposed Playground 02	Ward No. 09	Puali Madaripur (043_00)	154-160	3 <sup>rd</sup> Phase	0.96
Proposed Waste transfer Station 01	Ward No. 09	Paschim Minajdi (066_02)	543	3 <sup>rd</sup> Phase	0.33
Proposed Waste transfer Station 02	Ward No. 05	Char Krishnanagar (295_00)	607	3 <sup>rd</sup> Phase	0.094
Proposed Eidgha	Ward No. 01	Pangashia (079_02)	1014-16	3 <sup>rd</sup> Phase	1.62
Proposed Ward Center 01	Ward No. 01	Rajdi (078_02)	1261	1 <sup>st</sup> Phase	0.55
Proposed Ward Center 02	Ward No. 02	UttarThengamara (082_00)	205	3 <sup>rd</sup> Phase	0.59
Proposed Ward Center 03	Ward No. 03	Char Fathebahadurpur (424_04)	1638	3 <sup>rd</sup> Phase	0.81
Proposed Ward Center 04	Ward No. 04	Char Jhautala (087_00)	97	1 <sup>st</sup> Phase	0.37
Proposed Ward Center 05	Ward No. 05	Char Sadipur (304_00)	490-92	2 <sup>nd</sup> Phase	0.54
Proposed Ward Center 06	Ward No. 06	Lakhimipur Pakhara (092_00)	478	1 <sup>st</sup> Phase	0.69
Proposed Ward Center 07	Ward No. 07	Rajdi (078_01)	620	3 <sup>rd</sup> Phase	0.74



Proposed Facility	Ward Name	Mouza Name	Plot No	Phasing	Acres
Proposed Ward Center 08	Ward No. 08	Dakshin Janardandi (067_01)	381	1 <sup>st</sup> Phase	0.36
Proposed Ward Center 09	Ward No. 09	Gopalpur (045_00)	176	2 <sup>nd</sup> Phase	0.62
			Total		74.9

### Transportation Facilities

Transportation facilities incorporate transport and communication services. For an example airport, bus terminal/stand, ferry ghat, filling station, garage, launch terminal, passenger shed, ticket counter, transport office, etc. In total, 4.48 acres land (0.06% of the planning area) is being proposed for this purpose.

### Utility Services

It incorporated all utilities and service facilities except health services. Utility services include water treatment plant, water reservoir, water pump house, public toilet, fire service, waste disposal centre, sewerage facilities including office, electricity supply including office or control room and over head water tank. In survey stage this type of land use was defined as service activity. In total, 17.96 acres land (0.24% of the planning area) including existing is being proposed for utility services.

### Health Services

This land will be used to provide health facilities. In total, 9.19 acres land (0.12% of the planning area) is being proposed for this purpose. A community based health centre will be provided at Ward Councillor's Office. Ward Councillor's Office is under in mixed-use category in land use plan proposal.

### Community Facilities

Community services include community centre, club house, fire service, civic centre, family planning facilities, religious centres, etc. In additionally all funeral places and other religious uses incorporated in this category. In total, 39.74 acres land (0.53% of the planning area) will be used for this purpose.

### Urban Deferred

The Urban Deferred refers to lands lying outside the urban growth area and identified as Urban Reserve. Total area under this use is proposed as 60.0 acres (0.8%) that include existing and proposed uses. Following are permitted uses within the Urban Reserve Zone:

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

### **Map 10.3: Development Proposal**



## **10.4 Plan Implementation Strategy**

### **10.4.1 Land Development Regulations to Implement the Landuse Plan**

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

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

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

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

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

5. For the conservation of archeological monuments or structures or historical development the Ancient Monuments Preservation Act, 1904 (Act No. VII of 1904) may be enforced. Archeological Department of Bangladesh and Paurashava authority through a partnership process may preserve such type of development.
6. To control air pollution due to brick burning with the establishment of brick field, Brick Burning Control Act, 1989 (Act No. VIII of 1989) is the appropriate regulation. The Paurashava authority may enforce this Act 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) Act, 1982 (Act No. IV of 1982) was enacted. For efficient enforcement of the Act, the Paurashava authority may execute the Act with the authorization of government.
8. The Paurashava will have to exercise strictly Playfield, Open space, Garden and Natural Tank in Urban Areas Preservation Act, 2000 (Act No. XXXVI of 2000) to some specially important areas like, riverfront and water bodies, drainage channels, low land below certain level, designated open space, etc. Development restrictions are needed around security and key point installations. The provision of restriction will strengthen the power of the plan to safeguard its development proposals and 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) Act, 1959 (No. XIX of 1959). In case of private hat and bazar, a management body is being empowered through the Bangladesh Hats and Bazars (Management) Order, 1973 (P.O. 73/72). The Paurashava authority is also empowered establishing hat and bazar in his jurisdiction through the Local Government (Paurashava) Act, 2009. Coordination may be framed among the government (Upazila Parishad), Paurashava and private owner for the establishment, development and management of the hat and bazar located in the Paurashava premises.
10. In the Paurashava premises, industrial development is controlled by the Bangladesh Cottage Industries Corporation through Bangladesh Cottage Industries Corporation Act, 1973 (Act No. XXVIII of 1973), Industrial Development Corporation through East Pakistan Industrial Development Corporation Rules, 1965 (No. EPIDC / 2A-2/63/354) and Factory Inspector through Factories Act, 1965 (Act No. IV of 1965). Locational aspects and issuing of trade license is controlled by the Paurashava authority. A joint coordination cell among those four authorities may control the establishment of factories and industries in the Paurashava.
11. In the Paurashava, for rain water harvesting, some specific ponds / tanks will needed to be preserved. A number of derelict tanks may be improved through tank improvement project and in this case Tanks Improvement Act, 1939 (Act No. XV of 1939) will support the Paurashava is regulatory aspects.
12. Except Khas land, a considerable amount of public land in the Paurashava may be identified as fallow land or unproductive land. In regulatory term those lands are considered as 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) Act, 1959 (Act No. E.P. XIII of 1959).

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

#### 10.4.2 Implementation, Monitoring and Evaluation of the Landuse Plan

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

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

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

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

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

- what will be the likely impact of the controls;
- how and by whom will the controls be administered and enforced.

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

**Implementation by Facilitating Private Investment:** Another approach that would be taken by government toward plan implementation will be to guide and facilitate investments made by the private sector. Government can achieve this with relative ease and at very low cost by setting up a legal and operational framework, coupled with suitable incentives, to facilitate land consolidation, plot boundary readjustment, efficient layout 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 Paurashava in a preferred manner. In a rapidly changing urban environment, the Landuse Plan would require to keep up to date. If this is not done, within a few years it will be obsolete. Therefore, it is imperative that the requirement for regular updating of the Landuse Plan be made a legal requirement.

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

### **Evaluation**

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

monitored and handicaps identified to enable taking appropriate measures at the right time.

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

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

### **Co-ordination**

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

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

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

In spontaneous areas, while all out people's co-operation is needed for project implementation; there will also be some elements of negotiation. Negotiation will be particularly needed in case of road widening projects. It will be a crucial task for Paurashava to convince the affected people to give up their land for road use. Efforts should be made to convince the land owners on the ground of enhancement of property value due to road widening. In case people refuse to offer land free of cost necessary arrangements may have to be made for payment of compensation. This process of negotiation will be very critical, cumbersome and time consuming, and therefore, has to



be handled with utmost care and patience. The best results can be accrued only by 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

## 11. TRANSPORTATION AND TRAFFIC MANAGEMENT PLAN

### 11.1 Introduction

Transportation system directs the urban development pattern. Performance of the transportation system largely influences the economy and social progress of an area. It provides mobility of people, goods and services to their destination. It has linkages with other sections of development and for a sustainable development of any area, its traffic and transportation system should be adequately addressed. This chapter of the report is on Transportation and Traffic Management Plan covering 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 planning area up to 2031. The report also provides the purpose and the rule of Transportation and Traffic Management Plan and its relation with Structure Plan and Land Use Plan.

### 11.2 Approach and Methodology

In order to identify the major causes of the congestion and the nature of the problem on transportation networks, a number of tasks were undertaken. Those tasks included traffic volume counting at both directions, speed and delay studies, Origin - Destination (O-D) survey at major traffic generating intersections and consultation with the stakeholders regarding the generated problems. The volume and movement pattern of people and goods within the planning area were collected through a series of volume survey and O-D survey.

In addition to collect information on volume and pattern of traffic movement by traffic survey, the Consultant accommodates certain important questions regarding people's attitude and preferences.

Two intersections are situated in the center of Kalkini Paurashava have been selected for traffic count survey. These locations can be considered as the key locations of Kalkini Paurashava. Those intersections are Thana Mor and Bhurghata Mor. Again, those two locationa have been formed four important links named Thana Mor to Mollarhat, Thana Mor to Old bazaar, Mollar Hat/ Samitir Hat to Old Bazar and Bhurghata to Kalkini.

### 11.2 Existing Conditions of Transportation Facilities

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

### 11.2.1 Roadway Characteristics and Functional Classification

The planning area covers 30.30 sq. km. (7473.20 acres) and road length is 108.3 km. The National Highway No. 7 runs through the Paurashava and links a number of Connector Roads and Access Roads. National Highway is the major arterial road of the planning area. It provides connection with Kalkini Paurashava to the south Bengal and Dhaka. There are two important road intersections named Thana Mor and Bhurghata providing linkages with other access roads. Those access roads are Thana Mor to Old Bazar Road, Thana Mor to Mollarhat Road, Mollar Hat to Old Bazar Road and Bhurghata to Kalkini Town Road.

The roads of the Paurashava belonging to number of agencies named Roads and Highways Department (RHD) responsible for National Highway No. 7, Local Government Engineering Department (LGED) responsible for construction and maintenance of Upazila and Union roads and Kalkini Paurashava responsible for construction and maintenance of roads within the Paurashava area. Existing transportation system is dominated by road network catering to the passenger service and freight transport.

The road network provides access to various places within the study area and connects various parts of the country following bus routes. Major trips of vehicles are generated from, within the Paurashava, Old Bazar Road, Bhurghata Road, Mollar Hat Road and Thana Mor Road and outside the Kalkini Paurashava, Dhaka, Dowladia Ghat, Taker Hat, Gournadi, Gopalpur, Madaripur and Bhanga Bus Stand. All inter district vehicles towards and from south Bengal runs through the National Highway No. 7 passes through the Kalkini Paurashava.

**Table 11.1: Road network**

Type	Length		Area	
	KM	%	Acres	%
Pucca	53.7	49.58	44.1	60.16
Semi-pucca	3.6	3.33	2.1	2.86
Katcha	51.0	47.09	27.1	36.98
Total	108.3	100.0	73.3	100.0

Source: Topographic Survey, 2009.

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

**Table 11.2: Major roads in the Paurashava**

Sl. No.	Name of Road	Avg. Width (m)	Length (km)
1.	Bhurghata to Kalkini Road	3.8	3.47
2.	Porsim Minajdi Sarak	3.0	0.86
3.	Uttar Rajdi Sarak	2.4	1.28
4.	Jurgawo Road	3.0	1.59
5.	Gowpalpur to Ramnagar Sarak	2.4	1.93

Source: Topographic Survey, 2009.

### 11.2.2 Mode of Transport

Road is the only mode of transport in the Paurashava. The road is using for efficient movement and multi-dimensional purposes. As a result, transportation survey includes only the road transportation and the outcome of the survey is presented in the following paragraphs.

### 11.2.3 Intensity of Traffic Volume

Traffic volume studies are conducted to determine the number, movements and classifications of roadway vehicles at a given location. These data help to identify critical flow time periods and determine the influence of large vehicles on vehicular traffic flow, or document traffic volume trends. Traffic volume survey shows that average traffic movement through the intersections per hour is 346 at hat day and 287 at non-hat day. Among the total traffic, 70% MV and 30% NMV both in hat day and non-hat day.

### 11.2.4 Level of Service: Degree of Traffic Congestion and Delay

#### 11.2.4.1 Traffic Congestion

Traffic conflict is common and frequent in the planning area, where there is combination of transport vehicles-slow and fast-on the streets. Major conflict and congestions occur in the places, where intensity of traffic movement is high, on street parking is made and on street loading or unloading of goods are taken place. The consultant surveyed the traffic movement all over the Paurashava and has identified three main points, where the traffic congestion is the highest. Those areas are bus stand intersection, Paurashava intersection and bazar intersection. At these points, the slow moving vehicles like, rickshaws and vans come in conflict with motorized vehicles, creating traffic congestion, as the number of slow moving vehicles is higher and the conflicts are usually frequent.

#### 11.2.4.2 Delay

The traffic delays in Kalkini Paurashava is caused by the interaction of various factors, such as congestion, inadequacy of carriageway widths, mixed traffic conditions, parked vehicles and heavy pedestrian flow and such delays are called congestion delays or operational delays are difficult to measure precisely. It is observed that peak hour period takes on an average 6%-10% excess time than off-peak hour period due to congestion, narrow road and improper design of intersections.

### 11.2.5 Facilities for Pedestrians

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

### 11.2.6 Analysis of Existing Deficiencies

#### 11.2.6.1 Roadway Capacity Deficiencies

As like other small towns in Bangladesh, Kalkini has also its own road and transportation deficiencies. The physical feature survey and traffic survey of major intersections revealed that none of roads and transportation facilities is properly designed. Traffic level is far behind the actual capacity of the intersections. Congestion is created by large number of slow moving vehicles waiting for passengers at the intersections.

#### Narrow Road Width

Narrow width of roads and poor maintenance of roads has been mentioned by most respondents as the major road problems in the Paurashava. About 38% of the respondents have pointed out the misery of road movement during monsoon when unpaved roads get muddy. Narrow width of roads is likely to become a major problem of traffic movement when the Paurashava will expand and density of population will increase in future with consequent increase of road traffic. The field survey shows, 89% of the households reported that the road widths in front of their houses are 8 ft. or less. This is alarming as this condition will become a source of traffic problem, when road traffic will increase. At present, no traffic problem regarding road width is in the Paurashava. Specific example on road width for creating traffic problem is presented below:

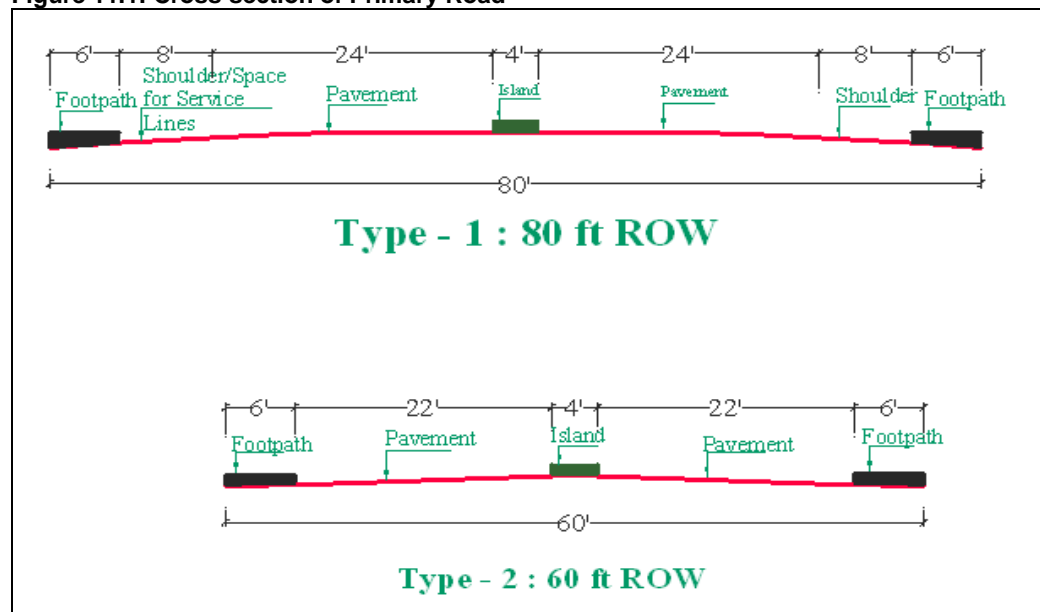
**Primary Road (Regional Road):** The Bhurghata to Kalkini Road is known as primary road, length is 3.47 km and average width 3.8 meter. Road standard (ROW) recommended in the Table-11.4 is 100 feet to 150 feet, proves that the standard (ROW) of the existing primary road in the Paurashava is lower than the standard (ROW) recommended. Moreover, in hat day and non-hat day, highest volume of traffic flows on the primary road and it is about 160 to 330PCU/hour. No deficiencies regarding the capacity of the primary road exists.

**Secondary Road:** Two secondary roads are in the Paurashava named Paschim Minajdi Sarak, length is 0.86 km and average width 3.0 meter and Jurgawo Road, length is 1.59 km and average width 3.0 meter.

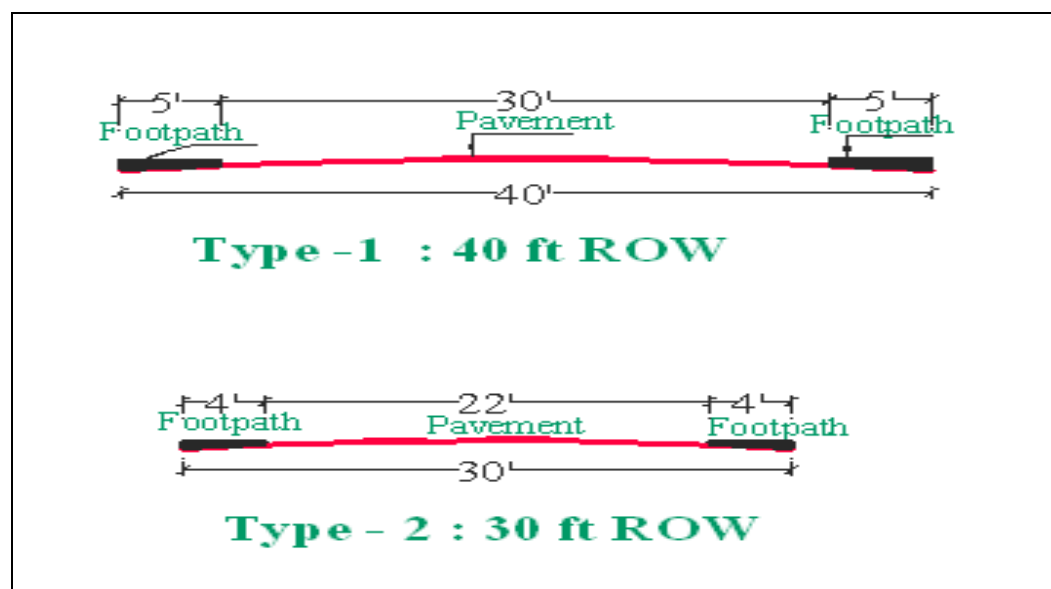
Road standard (ROW) recommended in the Table-11.4 is 60 feet to 100 feet, proves that the standard (ROW) of the existing secondary roads in the Paurashava is lower than the

standard (ROW) recommended. Moreover, in hat day and non-hat day, highest volume of traffic flows on those secondary roads is about 150PCU/hour. No deficiencies regarding the capacity of those secondary road exits.

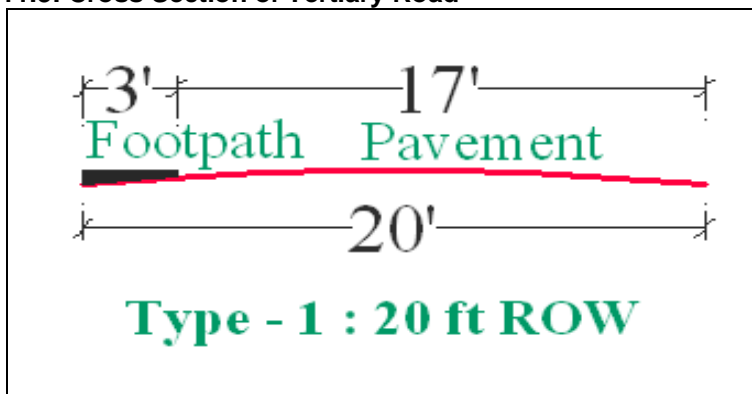
**Figure 11.1: Cross-section of Primary Road**



**Figure 11.2: Cross Section of Secondary Road**



**Figure 11.3: Cross Section of Tertiary Road**



**Tertiary Road:** In the Paurashava, two tertiary roads have been identified and they are Uttar Rajdi Sarak, length is 1.28 km and average width 2.4 meter. Gopalpur to Ramnagar Sarak, length is 1.93 km and average width 2.4 meter.

Road standard (ROW) recommended in the Table-11.4 for tertiary road is 20 feet to 40 feet, proves that the standard (ROW) of the existing tertiary roads in the Paurashava is lower than the standard (ROW) recommended. Moreover, in hat day and non-hat day, highest volume of traffic flows on those tertiary roads is about 445 PCU/hour. No deficiencies regarding the capacity of those tertiary road exits.

**Table 11.3: Hierarchy of road**

Sl. No.	Road Type	Name of Road	Avg. Width (m)	Length (km)	Starting to End
1.	Primary	Bhurghata to Kalkini Road	3.8	3.47	Janata Bank to Abul hasem feeling station
2.	Secondary	Paschim Minajdi Sarak	3.0	0.86	Ward No. 1 to West Minajdi Mosque
3.	Secondary	Jurgawo Road	3.0	1.59	Ward No. 3
4.	Tertiary	Uttar Rajdi Sarak	2.4	1.28	Burghata to Kalini Road to Molla bari
5.	Tertiary	Gopalpur to Ramnagar Sarak	2.4	1.93	Ward No. 9 to Ward No. 8

**Access road:** Road standard (ROW) recommended in the Table-11.4 may be imposed on access road and it is 20 feet to 40 feet. In the Paurashava, all access roads are less than 12 feet and most of them are using as footway. Non-motorized vehicles named Van sometimes use those walkways. No deficiencies regarding the capacity of those access road exits.

### **Tortuous Road and Missing Link**

A major characteristic of spontaneously developed roads is that they are tortuous in their shapes. This is because land owners allow roads to follow the alignment of the edges of the tortuous plot boundaries. Another problem of community initiated roads is that they are not in a well linked network. Sometimes links to nearby roads are missing. This causes

people to travel comparatively longer distances to reach a nearby destination. In the Paurashava, though, such type of problems is not in scenarios but with the increase of physical growth this type of problem will be specific.

#### **11.2.6.2 Operational, Safety, Signal and Other Deficiencies**

Traffic management system is absent in the Paurashava. No operational system yet being imposed on traffic movement.

Due to the minimum PCU/hr. both in hat and non-hat day, availability of non-motorized vehicles and absent of available built-up area, road safety exists naturally in the Paurashava.

Traffic signaling system is totally absent in the Paurashava. Generally, traffic signaling system will not be needed up to the limit of the planning period. On some specific point of primary and secondary roads, traffic signaling will be needed.

#### **11.2.7 Condition of Other Mode of Transport (Rail/Water/Air)**

No railway, water way and air way facilities in the Paurashava.

### **11.3 Future Projections**

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

#### **11.3.1 Travel Demand Forecasting for Next 20 Years**

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

Present population of the Paurashava is 38498 (2011) and in the year 2021 it will be 44554. Highest PCU/hr. at hat day is 677 and non-hat day is 295. The scenario proves that



traffic congestion is not alarming. At the sametime, highest road width at present is 24 feet (ROW) and it will be saturated with the traffic if the PCU/hr. increases above 800.

It is expected that gradual implementation of the components prescribed in the Master Plan will increase traffic volume.

About 34% people's income of the Paurashava is between Tk. 6000 to Tk. 9000. On the other hand, 25% are involved with small business and 45% with agriculture. Housing condition is 92% katcha structures. The scenario proves that the Paurashava dwellers have no capability to increase traffic volume provisioning motorized vehicles. They will increase non-motorized vehicles and Nosimon.

After construction of road cum embankment, a large amount of single-crop land will turn into double-crop land. As a result, agro-product will be increased. With the increase of agriculture production, non-motorized vehicles will be increased for marketing of agro-product.

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

At present, about 98% traffic is under the private sector and 80% enjoying by the non-motorized vehicles. It is expecting that the scenario remain stable for next 20 years.

**Map 11.1: Existing Roads of Kalkini Paurashava**



### 11.3.2 Transportation Network Considered

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

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

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

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

## 11.4 Transportation Development Plan

### 11.4.1 Plan for Road Network Development

For an efficient road network development, implementation of some of the recommendations made by the Roads and Highways Department in 2008 would be essential. In order to serve the Paurashava, as well as the local traffic around Paurashava, an analysis will present in the proposals. It is found that many of the road links are not recommended by the Roads and Highways Department. Further analysis under the Transportation Plan will be revealed that most of the links suggested by this study are infect required to be developed in a phased manner. Under the Transportation Plan, an attempt is being made to promote two major link roads in the Paurashava. These could be called the “Madaripur Link Road and Gournadi Link Road. At present, from west to eastern part and from south to northern part, all vehicles movement is through the link road with inter-district road at Kalkini Bus Stand. Kalkini Bus Stand is linked the Paurashava from western part. Southern and eastern link road will be needed.

The standard considers here is given by the UTIDP, LGED to draw the transportation development plan. Following are the suggested planning standards for road network development. These road hierarchies are proposed based on the functional linkage of the road of Kalkini Paurashava.

**Table 11.4: Proposal for Road Standard**

Class of Roads	Standards recommended
Paurashava Primary roads	Row 60-80 ft.
Paurashava Secondary roads	Row 30-40 ft.
Tertiary Road	Row 25 ft.
Local roads / Access Road	Row 20 ft.

Source: Upazila Towns Infrastructure Development Project, 2010.

## **Neighborhood and Local Road**

The right of way (RoW) of neighborhood (mahallah) roads may be in between 20ft. to 30ft wide depending on their functions.

## **Road Design Standard**

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 Road**

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

**Cross-section of the Roads:** There are several numbers of major roads in the Kalkini Paurashava. Burghata to Kalini Road which is the primary road and other three are Paschim Minajdi Sarak, Uttar Rajdi Sarak and Gopalpur to Ramnagar Sarak. The cross-section of theses major roads are given below.

**Long-section of the Roads:** Long-section of the two major roads has been taken of the Kalkini Paurashava. The graph of Bhurghata to Kalkini Road represents that the average height of this road is about 7.5 meter and level vary within 1 meter. The long-section of Paschim Minajdi Sarak represents that its average height 6.7 meter and its level more or less equal.

## **Madaripur Link Road**

The road connects Dhaka–Barisal National Highway in between Ward No. 6, 4, 8 and 9 from east to west is known as Madaripur Link Road. The specific local roads of those Wards may be improved and widening to identify the Madaripur Link Road. This will be the major road in northern part of the Paurashava. This link road will produce an important intersection on the Dhaka–Barisal Highway. This intersection may be the focal point for the northern local roads of the Paurashava.

All local roads in northwestern part will connect this link road. Three local roads in the Ward No. 8, one local road in the Ward No. 6 towards north may be linked with the Madaripur Link Road. Again, one local road in the Ward No. 9, two local roads in the

Ward No. 4 towards south may be linked with the Madaripur Link Road. The proposed northern link road will serve both Paurashava and regional traffic and will reduce traffic congestion on the inter district road. It will help in distributing traffic around the Kalkini Bus Stand area and thereby reduce traffic congestion. The missing links of this link road naturally deserve priority in terms of resource allocation and emphasis on their early implementation.

### **Gournadi Link Road**

This link road will connect the central part of the Kalkini Paurashava with the Dhaka–Barisal road passes through the Gournadi Upazila. Existing local road in the Ward No. 1 and 2, from north to south along the western side of the river may be improved and widening as a Gournadi Link Road. This road will be expanded further towards north following the existing local road linked in the same direction. Vehicles from northern, central and southern parts of the Paurashava towards Gournadi and Barisal regions may use this link road. This will be the shortest distance to reach Barisal from Kalkini.

Improvement of other local roads which deserve priority attention and could contribute a lot in reducing pressure on the existing focal points of the Paurashava are as follows:

Widening and improvement of two local roads from Upazila road to the river between Ward No. 1. towards south.

2. Widening and improvement of two local roads from Gournadi Link Road up to Paurashava boundary between Ward No. 3.
3. More one bridge will be needed on the River in Ward No. 3.

An initiative should be taken to develop an effective and efficient arterial road network, which could provide a gridiron system with lots of alternative links for movement in different directions.

#### **11.4.2 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.

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

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

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

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

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

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

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

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

- Links between the Paurashava and primary roads;

- Links between various important nodes of activity within the Paurashava.

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

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

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

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

In general, no direct access will be permitted onto the main carriageways (of secondary roads) with access gained only at controlled junctions. Occasionally, due to existing situations, access from a side road may be entertained. The number of junctions should be minimized with desired spacing being at 200 meter intervals.

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

Functions of the **tertiary road** are:

- collect and distribute traffic to and from access roads from predominantly residential areas to other parts of the 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.

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

Initial step will be to determine two points between which the new road will be required. In certain instances, the precise intersection or connection point will be obvious, whilst in other cases only a generalized location is identifiable in the first instance. Determination of the exact connection points can only be made once further steps in the process have been undertaken.

Having identified two connection points (either known or vague), next step will be to conduct a search of a wide area to identify a number of alternative routes. Width of the area subjected to this search will vary according to individual circumstances, with the area being relatively narrow in dense Paurashava locations (say 80 to 100 meters), but wider in more rural settings (say 200 to 300 meters).

The number of alternative alignments to be identified will also vary, but as a general rule, a maximum of five alignments will be chosen. When identifying each of the different alignments, care will be taken to ensure that they are realistic and capable of accommodating the width of reserve required for the standard of road envisaged.

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

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

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

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

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

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

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

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

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

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

A number of new roads including improvement of existing roads are presented in the following table. In the Paurashava, one primary road named National Highway No. 7 lying with length 3.47 km under the Paurashava jurisdiction.

All the roads may be constructed under the road development scheme approved by the government for the authorities named RHD, LGED and Paurashava. In total, 108.3 km

existing roads and 110448 meter roads have been proposed for efficient accessibility of the Paurashava.

**Table 11.5: List of proposed new roads**

Road Id	Road Type	Width (ft)	Length (m)	Phase
R16	Tertiary	30	402.961	3rd Phase
R24	Tertiary	30	828.774	2nd Phase
R55	Tertiary	30	1161.059	1st Phase
R55	Tertiary	30	1190.103	1st Phase
R22	Tertiary	30	2427.983	1st Phase
		Total	6010.880	
R19	Access	20	1193.038	3rd Phase
R21	Access	20	747.586	3rd Phase
R29	Access	20	547.119	3rd Phase
R54	Access	20	1491.566	1st Phase
R65	Access	20	1308.736	3rd Phase
R70	Access	20	458.059	3rd Phase
R72	Access	20	972.916	3rd Phase
R86	Access	20	513.351	1st Phase
R87	Access	20	303.309	3rd Phase
R88	Access	20	626.137	3rd Phase
R89	Access	20	590.167	2nd Phase
R90	Access	20	2727.272	1st Phase
		Total	11479.256	
		Gross Total	17490.136	

**Table 11.6: List of proposed widening roads**

Road Id	Road Type	Width (ft)	Length (m)	Phase
R03	Primary	80	2128.8	3rd Phase
R12	Primary	80	6524.2	3rd Phase
R63	Primary	60	1794.7	1st Phase
R69	Primary	60	3900.5	1st Phase
R73	Primary	60	5767.0	1st Phase
R74	Primary	60	2907.8	3rd Phase
		Total	23023.1	
R43	Secondary	40	3631.9	1st Phase
R76	Secondary	40	1308.9	2nd Phase
R78	Secondary	40	1532.5	3rd Phase
R79	Secondary	40	4309.3	1st Phase
R82	Secondary	40	1510.1	3rd Phase
R37	Secondary	40	6184.2	1st Phase
R26	Secondary	40	1795.6	2nd Phase
		Total	20272.5	
R02	Tertiary	30	1127.9	3rd Phase
R04	Tertiary	30	1214.1	3rd Phase
R06	Tertiary	30	232.6	3rd Phase
R10	Tertiary	30	577.3	3rd Phase
R13	Tertiary	30	992.0	3rd Phase
R14	Tertiary	30	1799.0	3rd Phase
R15	Tertiary	30	324.2	3rd Phase
R20	Tertiary	30	791.7	3rd Phase
R27	Tertiary	30	509.5	3rd Phase
R28	Tertiary	30	694.0	2nd Phase
R30	Tertiary	30	1511.3	3rd Phase
R34	Tertiary	30	1354.4	2nd Phase
R38	Tertiary	30	1374.2	3rd Phase
R47	Tertiary	30	3348.4	2nd Phase
R48	Tertiary	30	1354.4	3rd Phase
R51	Tertiary	30	2060.5	1st Phase

R64	Tertiary	30	1047.9	3rd Phase
R67	Tertiary	30	2991.0	3rd Phase
R75	Tertiary	30	642.0	2nd Phase
R80	Tertiary	30	1058.3	2nd Phase
R81	Tertiary	30	358.4	3rd Phase
R83	Tertiary	30	1530.0	3rd Phase
R08	Tertiary	30	685.3	3rd Phase
		Total	27578.5	
R01	Access	20	526.6	3rd Phase
R05	Access	20	1180.1	3rd Phase
R07	Access	20	152.2	3rd Phase
R09	Access	20	1577.8	2nd Phase
R11	Access	20	1248.8	3rd Phase
R17	Access	20	214.7	3rd Phase
R18	Access	20	149.6	3rd Phase
R23	Access	20	519.1	3rd Phase
R25	Access	20	352.0	3rd Phase
R31	Access	20	1225.9	3rd Phase
R32	Access	20	134.6	3rd Phase
R33	Access	20	966.9	3rd Phase
R35	Access	20	853.0	3rd Phase
R36	Access	20	496.7	3rd Phase
R39	Access	20	977.9	3rd Phase
R49	Access	20	907.7	3rd Phase
R53	Access	20	826.7	3rd Phase
R56	Access	20	466.7	3rd Phase
R57	Access	20	1111.0	2nd Phase
R58	Access	20	1853.0	1st Phase
R59	Access	20	494.2	3rd Phase
R60	Access	20	1024.4	3rd Phase
R61	Access	20	1069.7	3rd Phase
R62	Access	20	661.5	3rd Phase
R66	Access	20	242.8	3rd Phase
R77	Access	20	1680.6	3rd Phase
R85	Access	20	445.6	3rd Phase
R44	Access	30	1085.8	1st Phase
R46	Access	20	1089.7	3rd Phase
R45	Access	30	2049.7	2nd Phase
R50	Access	20	801.3	3rd Phase
		Total	26386.4	
		Gross Total	97260.5	

## 11.4.2 Plan for Transportation Facilities

### 11.4.2.1 Transportation Facilities Plan

Transportation facilities and services include Bus Terminal, Bus Stoppage with Shade, Ticket Counter, Waiting Place for Travelers, Parking Space for Motorized and Non-motorized Vehicles, Service Centre and Washing / Toilet Facilities. At present, no formal transportation facilities and services are available in the Paurashava.

The bus terminal proposed in the plan will accommodate all type of transportation facilities. The proposed area for bus terminal is 1.5 acres and it is located at the Ward No. 1. Bus stand and intersections are using as bus stops including loading and unloading of man and materials. Those intersections are also using for parking both motorized and

non-motorized vehicles. Informal economic activities also often encroaches road space. All those factors are together resulted in traffic congestions and also for a cause of accident. Kalkini bus stand (locally known as Bus Stand Mor) is the key intersection that connects the National Highway (Dhaka–Barisal). This intersection has highest volume of traffic and most of that traffic uses the carriageway for parking for loading and unloading man and goods.

An architectural design of transport terminal should incorporate the transportation facilities as mentioned above. The proposed parking areas will be included in the areas mentioned for bus terminal.

**Table 11.6: Proposed Transportation Facility**

Proposed Facility	Ward Name	Mouza Name	Plot No	Phasing	Acres
Proposed Bus Terminal	Ward No. 09	Dakshin Gopalpur (044_00)	394, 395, 389	2 <sup>nd</sup> Phase	1.22
Proposed Truck Terminal	Ward No. 09	Gopalpur (045_00)	193,196-97	2 <sup>nd</sup> Phase	2.56
Proposed Auto Stand	Ward No. 01	Pangashia (079_01)	96	2 <sup>nd</sup> Phase	0.048

### Tempo Stand/ Powerbike Stand

Tempo is now a major and a cheaper mode of transport in small urban area and perform important role in commuter transportation. No formal tempo stands in Kalkini Paurashava. Proposed area of the tempo stand is about 5 decimal. The consultant proposed to develop tempo stand to ensure the maximum utilization.

#### 11.4.2.2 Development of Facilities for Pedestrian, Bicycle and Rickshaw

During field survey, it was observed that people move in both directions, going in and out using both sides of the roads. It is noted that no footpath is available in this Paurashava for pedestrian movement. Pedestrians mostly use carriageway and right of way of the roads. In most cases, pedestrians use road shoulders for walking but they are being obstructed by the informal business men. Separate provision for bicycle and rickshaw is not needed.

From Traffic volume survey it is gathered that following roads carry extreme pedestrian due to eminent commercial activities in the heart of Paurashava. Following table shows roads carrying most of the pedestrians and recommendation thereof.

**Table 11.6: Proposed footpaths on major roads**

Sl. No.	Road Name	Average width (M)	Length (km)	Proposed footpath (km)
1.	Bhurghata to Kalkini Road	3.8	3.47	1.50
2.	Poschim Minajdi Sarak	3.0	0.86	0.40
3.	Uttar Rajdi Sarak	2.4	1.28	0
4.	Jurgao Road	3.0	1.59	0.80
5.	Gopalpur to Ramnagar Sarak	2.4	1.93	0

**Map 11.2: Proposed Circulation Network**



#### **11.4.2.3 Other Transportation Facilities**

Other transportation facilities includes launch/boat ghat. If water ways will be provisioned in the Palardi River, 2 boat ghats should be constructed. Those ghats may be designed considering water-based tourism.

#### **11.4.3 Waterway Development / Improvement Options**

One boat ghat named Bhurghata and the bus stand named Kalkini Bus Stand is found in the Paurashava. The boat ghat is under the jurisdiction of Paurashava authority. Fish and agro-product mostly transported through country boat from Bhurghata to small growth centres adjacent to the Kalkini Paurashava. Kalkini Bus Stand is not an ideal bus stand; it is just a stoppage on the National Highway as an intersection.

##### **11.4.3.1 Proposal for Improvement of the Existing Waterway**

Existing Palardi River should be re-excavated to improve the waterway throughout the year.

##### **11.4.3.2 Proposal for New Waterway Development**

Encourage private sector to involve with the construction of water ways. BOT (Build Operate and Transfer to the Government) system for private sector will appropriate.

The Paurashava may, in collaboration with the Inland Water Transport Authority (IWTA), develop the water ways using the Palardi River.

#### **11.4.4 Railway Development Options**

No railway development is possible in the Kalkini Paurashava.

### **11.5 Transportation System Management Strategy (TSMS)**

#### **11.5.1 Strategies for Facility Operations**

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

An improved traffic management system should be imposed. All facilities involved with this system should be provisioned.

The land uses at the intersections should be controlled with the provisioning of passenger shade, public toilet, ticket counter, tea stall and other necessary facilities.

Parking facilities for motorized and non-motorized vehicles should be provisioned during construction of roads.



### **11.5.2 Strategies for Traffic Flow and Safety**

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

- A comprehensive road network plan has been prepared for the Paurashava using a hierarchy of road network. Implementation will also be followed following this hierarchy.
- In case of local roads a participatory approach will be developed to realize at least a part of the development cost bears by the beneficiaries. This will also help to reduce delay and cost involved in land acquisition for road construction.
- Proposed roads in those areas will be chosen for immediate construction that is needed to promote growth in that area.
- Incremental Road Construction Approach will be adopted to get rid of unnecessary construction costs, where roads remain underutilized.
- Service roads will be constructed along with the major roads to allow free flow of long distance traffic.
- A restricted buffer zone will be created along primary roads passing through agriculture to discourage roadside development.

### **11.5.3 Strategies for Traffic Management**

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

## **11.6 Plan Implementation Strategies**

### **11.6.1 Regulations to Implement the Transportation Plan**

Following regulations will be needed for implementation of the plan.

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

- a) establish ownership and responsibilities for roads;
- b) establish the framework for managing the road network;
- c) establish general principles for road management;
- d) provide for general design and planning principles for roads;
- e) confer powers and responsibilities on road authorities;

**Map 11.3: Proposed Transport Infrastructure**



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

Section 5 has defined public roads as-

- 1) The Government may declare a public road.
- 2) The declaration may be made in relation to land, whether or not it is currently used for passage by members of the public.
- 3) In the declaration, the Government shall classify the public road as:
  - (a) a national road; (b) a regional road; (c) a Zila road; (d) an urban road;
  - (e) an Upazila road; (f) a union road; (g) a village road.

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

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

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

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

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

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

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

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

erects, places or retains a sign on a public road, or

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

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

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

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

#### **11.6.2 Implementation, Monitoring, Evaluation and Coordination of the Plan**

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

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

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

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

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

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

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

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

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

### **Evaluation**

Monitoring and evaluation of on going and implemented projects is essential to keep the future course of action on the right track. An on going project should be regularly

monitored and handicaps identified to enable taking appropriate measures at the right time.

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

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

### **Co-ordination**

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

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

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

In spontaneous areas, while all out people's co-operation is needed for project implementation; there will also be some elements of negotiation. Negotiation will be particularly needed in case of road widening projects. It will be a crucial task for Paurashava to convince the affected people to give up their land for road use. Efforts should be made to convince the land owners on the ground of enhancement of property value due to road widening. In case people refuse to offer land free of cost necessary arrangements may have to be made for payment of compensation. This process of negotiation will be very critical, cumbersome and time consuming, and therefore, has to



be handled with utmost care and patience. The best results can be accrued only by winning people's confidence. In case the authority fails to get peoples co-operation they should exercise power of compulsory acquisition of land through Acquisition of Requisition of Immovable Property Act, 1982. Attempts may be made to engage NGOs / CBOs / RHD / LGED to work as catalysts in negotiation.

# CHAPTER 12

## 12. DRAINAGE AND ENVIRONMENTAL MANAGEMENT PLAN

### 12.1 Drainage Management Plan

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

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

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

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

#### 12.1.1 Goals and Objectives

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

### **12.1.2 Methodology and Approach to Planning**

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

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

## **12.2 Existing Drainage Network**

### **12.2.1 Natural Drainage System**

The natural drainage network is composed with 644 ditches, 786 ponds, 68 irrigation canals and two rivers. They are naturally formed. Generally, the canals are flowing towards north to south. The canals in total 61.5 km length and covers 178.0 acres land. Length of river is 15.2 km and covers 173.0 acres of land.

There are natural drainage systems along roadside and the linkage between natural and man-made drainage system in somewhere. The Arialkhan and Palardi Rivers and the canal provide opportunity of natural drainage system.

There are linkages between natural and man-made drainage system. But how much effective and active the linkage is with the poorly maintained man-made drains is a question. Almost half of the depth of the man-made drain is filled with solid garbages; as a result, the channel is not properly functioning.

**Table 12.1: Existing natural drainage network of Kalkini Paurashava**

Type	Nos.	Length (Km)	Area	
			Acres	%
Ditch	644		89.00	13.70
Pond	786		209.44	32.25
Khal/ Irrigation canal	68	61.5	178.00	27.41
River	2	15.2	173.00	26.64
Total	1500	76.7	649.44	100.0

Source: Physical Feature Survey, 2009.

### 12.2.2 Man-made Drains

In the Paurashava, 4 man-made drain covering different parts of different Wards. Total length of those drains is 5.35 km. covering an area of 0.98 acres of lands. All the drains are pucca with 0.46 meter average width. Uncovered drains are mostly in existence with poor condition.

**Table 12.2: Statistics of existing man made drainage network of Kalkini Paurashava**

Ward No.	Type	Length (KM)	Area (Acre)	Average width (m)	Quality	Status
1	Drain Pucca	2.33	0.47	0.50	Average	Uncovered
2	Drain Pucca	1.20	0.22	0.48	Average	Uncovered
3	Drain Pucca	0.52	0.10	0.25	Average	Uncovered
7	Drain Pucca	1.30	0.19	0.59	Average	Uncovered
Total		5.35	0.98			

Source: Physical Feature Survey, 2009.

Man-made drain is in the Ward No. 1, 2, 3 and 7. Highest part of the drain is in Ward No. 1 (2.33 km). All drains in the Paurashava are privately constructed. Status of the drains is uncovered. According to the quality, all drains are in average. The drains in Ward No. 1, 2 and 7 are wider than the drain is in Ward No. 3. The drains are usually damaged side walls, surfaces with obstructions, debris, solid waste, irregular water way, etc.

The drains are poorly managed. Uncovered drains are common feature and the result of uncovering is ultimately filling and losing the drain. Necessity of covering the drains are not only from environmental and safety perspective but also it is a local need. The adjacent river is using as a part of natural drainage system. The drainage condition, serviceability, structural condition, obstruction, situation, blockage are found in those drainage networks (though a few in the Paurashava). Water drained irregularly through those networks and they are also using as solid waste dumping ground.

Open drains are common feature and the result of uncovering is ultimately filling and losing the drain. Necessity of covering the drains are not only from environmental and safety perspective but also it is a local need. Adjacent rivers are using as a part of natural drainage system.

### 12.2.3 Analysis on Land Level Topographic Contour

The planning area is mainly medium highland excepting some low lying strips, canals and river. 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). In the study area, it has found that usually roads are not very high than the surrounding area except National Highway. The height varies from 1 meter to 9 meter in comparison with the adjacent lands and roads. Most of the low lands are found in all the Wards except Ward No. 6. The land within the boundary of inter-district road is high. High land is available in the Ward No. 1, 2, 4, 6, 7 and 9. Height of those high lands is varied from 2 meter to 8 meter.

**Table 12.3: Spot Interval and Frequency**

Sl. No.	Spot Interval	Spot Number (Frequency)	Average	%
1	1.00 to 3.00	6694	2.46	60.16
2	3.01 to 5.00	3794	3.56	34.1
3	5.01 to 7.00	610	5.75	5.48
4	7.01 to 9.00	29	8.49	0.26
	Total	11127		100

Source: Topographic Survey, 2010.

A total of 11127 measurements have taken in the Paurashava area to ascertain the topographic condition. According to the survey findings, the lowest land elevation has found in Ward No. 3 and highest elevation in Ward No. 4. A contour map has prepared covering the planning area.

**Table 12.4: Spot Value and their Unit (Number of Spot (Z) Value and their Statistics)**

Sl. No.	Spot Unit	Value	Sl. No.	Spot Unit	Value
1	Total Spot Number	11127	4	Minimum (Meter)	1.005
2	Mean (Meter)	3.036	5	Standard Deviation	0.989
3	Maximum Height (Meter)	8.926			

Source: Topographic Survey, 2010.

**Table 12. 5: Ward-wise land level information of Kalkini Paurashava**

Ward No.	Frequencies of observation	Minimum Height (Meter)	Maximum Height (Meter)	Average Height (Meter)
1	1459	1.01	8.86	3.39
2	821	1.03	8.85	3.60
3	1990	1.00	7.90	2.63
4	727	1.03	8.92	3.20
5	1593	1.33	5.23	2.88
6	947	2.19	3.60	3.07
7	666	1.01	8.21	3.17
8	1759	1.03	8.59	2.83
9	1165	1.01	8.91	3.17
Total	11127			3.10

Source: Topographic Survey, 2010.

**Table 12.6: Description of maximum and minimum land level (in meter)**

Value Rank	Value	Ward No	Mouza Name	JL No	Sheet No	Plot No
Maximum value	8.92	04	Lamcari	298	01	85
Minimum value	1.00	03	Shikarmangal	423	02	1590

Source: Topographic Survey, 2010.

**Map 12.1: Existing Drainage Network of Kalkini Paurashava**



**Map 12.2: Land Level of Kalkini Paurashava**





The river named Arialkhan and Palardi is adjacent to the Paurashava and flowing through north to south on the eastern and western boundary line. A gentle meandering is viewed in the middle point (in the Ward No. 1) of the Paurashava. The land elevation of the Ward adjacent with the river is varied within 2 meter to 8 meter. Steep slope (about 80° angle) of the side wall of the river adjacent with the Wards No. 1 and 6 is found. Again, about 65° angle land elevation of the river adjacent with the Ward No. 3 and 5 are prominent. Alignment of khals and natural channels are in somewhere 1 meter to 2 meter high than the normal river water. No settlement or any type of construction is found adjacent with the river especially in the Ward No. 2, 3 and 5.

### **Peak Hour Run off Discharge and Identification of Drainage Outfalls**

Kalkini Paurashava lies in the tropical monsoon climatic region and more specially, represents the climate of Madaripur district. It has a normal rainfall of 325.4 mm in the month of June which is highest among all other months. In September, it falls to 232.5 mm; again falling to 145.8 mm in October. The rainy season begins with April/May and usually ends in the end of October. The highest number of normal rainy day is in July, which is the highest rainfall month. About 14 rainy days at an average in July, followed by 15 rainy days in August, 14 in June, 11 in May and September has been the characteristics of rainy day as the data reveals.

No peak hour run off storm water discharge is found. During rainy season, rain water is being drained through the man-made drains. All pucca drains are linked with the natural water bodies like canal and river as an outfall. As a result, waters of the river and canals are polluting through those discharging elements. The Arialkha and Palardi Rivers is the outfall of all natural and man-made drained water.

#### **12.2.4.1 Method Used**

**Storm and used water:** The drains are designed to collect excess rainfall that comes as surface runoff from urban area, convey the runoff and finally discharge them to outfalls. The design of drains involves hydrological computations of rainfall intensity, its frequency of occurrence, duration etc., and the total run off of a particular area. The modified rational method shall be used for calculation of peak runoff for a definite frequency and duration from particular drainage basin. One limitation of this method is that it cannot be used for catchment area greater than 320 acres. The Natural Resources Conservation Service (NRCS) method formerly the US Soil Conservation Service (SCS) method shall be used.

In Modified Rational Method, the overall watershed is divided into zones that contribute to hydraulically significant points of concentration. The boundary of the zones is established based upon local topographic boundaries such as streets, existing drainage

systems, etc., using good engineering practice. The design flow rate by Modified Rational Formula is –

$$Q = C_s C_r I A$$

Where:

Q	=	Design runoff flow rate (cfs)
I	=	Rainfall intensity (in/hr)
C <sub>s</sub>	=	Storage coefficient
C <sub>r</sub>	=	Runoff coefficient
A	=	Drainage area (acres)

**Rainfall Intensity (I):** The rainfall intensity is the average rainfall rate for a particular drainage basin or sub-basin. The intensity is selected on the basis of the design rainfall duration and return period. The return period is established by design standards as a design parameter. Rainfall intensity with 5 years return period is generally employed for design of primary drains and canal improvement. Rainfall intensity with 3 years return period is employed for design of secondary drains. The design duration is equal to the time of concentration for the drainage area under consideration. Time of concentration is a critical parameter both for the Modified Rational Equation and SCS method. Time of concentration is generally defined as the longest runoff travel time for contributing flow to reach the outlet or design point, or other point of interest. It is frequently calculated along the longest flow path physically.

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

The second part of the Time of Concentration is the Travel Time that takes the flow to travel along the drain. Channel flow occurs in channels carrying integrated flows, pipes (flowing partially), and streams. Where storage is not significant, Travel Times can be estimated by applying Manning's Equation, and using estimates of channel characteristics

and appropriate roughness values for pipe, channel, or stream features as tabulated in Table-12.7.

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

Where

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

And

$$T_t = V / (60L)$$

Where

- T<sub>t</sub> = Travel time, minutes  
V = Velocity, feet/second  
L = Length, feet

Manning's roughness coefficient for channel flow is listed in Table-12.7.

**Table 12.7: Manning's "N" Values for Channel Flow**

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

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

**Storage Coefficient (Cs):** Due to very flat topography of Bangladesh, the runoff is significantly slow. The rainfall after evaporation and infiltration accumulates first in the depressions, until these have been reached their capacity and then runoff. To take these effects a storage coefficient is used. The value of the storage coefficient is based on average ground slope and the nature of the ground surface. Some of the storage coefficients are listed in Table-12.8.

**Table 12.8: Storage Coefficients for flat land**

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

Paved area/road	0.80	0.90	1.00
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Source: Countywide Comprehensive Plan (Master Drainage Plan) Exhibit-VIII.

**Runoff Coefficient (Cr):** The runoff coefficient (Cr) values shall be assigned to the various land use zoning classifications. The runoff coefficient values are based on the slope of the land surface, degree of imperviousness and the infiltration capacity of the land surface. The type of land use can greatly affect the amount of runoff. The quantity of runoff and peak flow rates are increased when the land is developed because the impervious surface area increases with the addition of roads, driveways, roofs, etc. The values of the runoff coefficient (Cr) for each land use classification are listed in Table-12.9.

**Table 12.9: Modified Rational Method Runoff Coefficients**

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

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

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

- The peak rate of runoff at any point is a direct function of the average rainfall for the time of concentration to that point.
- The recurrence interval of the peak discharge is same as the recurrence interval of the average rainfall intensity.
- The Time of Concentration is the time required for the runoff to become established and flow from the most distant point of the drainage area to the point of discharge.

## 12.3 Plan for Drainage Management and Flood Control

### 12.3.1 Plan for Drain Network Development

#### Drain Network Plan

The activity for the relevant authority will be assisted by the preparation of the drainage master plan for the Paurashava which details the necessary corridors, plot sizes and generalized locations for:

- Primary canal/khal (new and improved).
- Secondary and tertiary canal / khal (new and improved).

- Storage ponds.
- Silt traps.
- River embankment.

Initially, the Paurashava will encourage implementation of the first phase recommendation of the drainage master plan. A brief summary of the proposals to be undertaken in Phase-1 is given below. Reference should be made to the Map for identification of the drainage areas referred in the text.

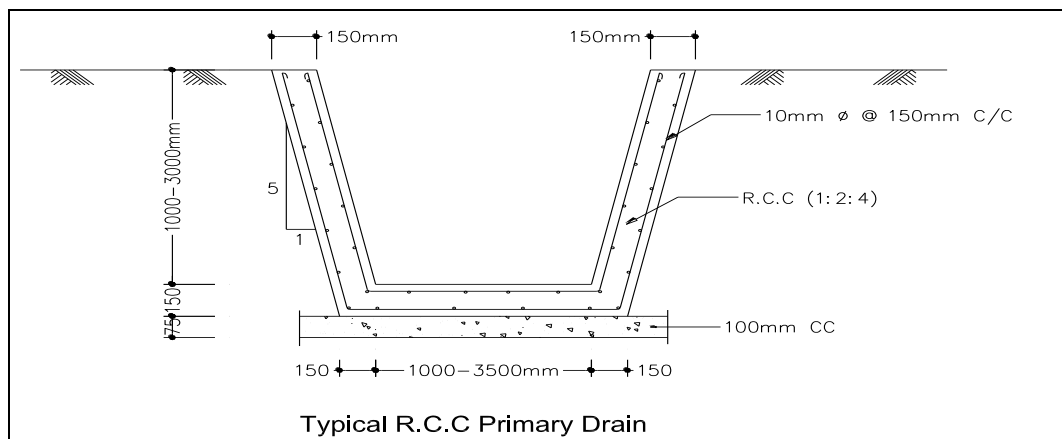
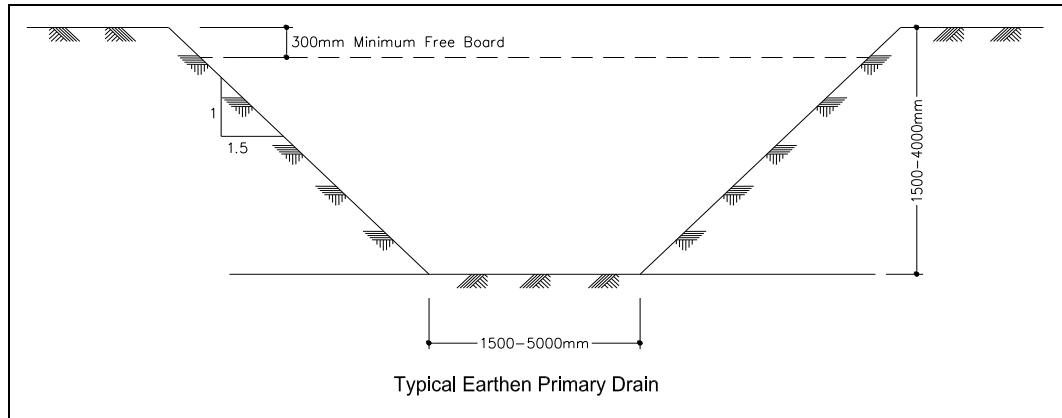
#### **Phase-1 (Storm water drainage)**

- Local improvements and the removal of obstacles from existing canals in drainage areas. Works to include:
  - Redesign of hydraulically inefficient bends, entrances and exists.
  - Rising and / or widening of bridges and culverts to give unobstructed flows.
  - Returning the channels to a uniform cross-section by removal of encroaching properties and structures.
  - Raising crossings over roadside channels to adjacent properties above the flood level of the waterway.

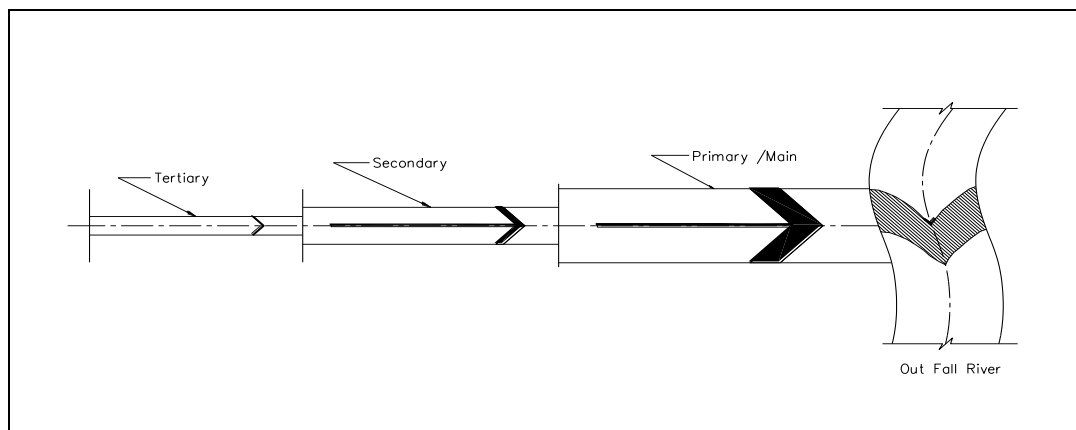
#### **Phase-2 (Rain water and household drainage)**

- Construction of surface drain linked with the residences, may be covered or uncovered.
- Provide linkages with secondary and tertiary drains.
- Out-fall of such drains may be nearby canals and low-lands.
- For discharging of rainwater from commercial areas, covered surface drain may be constructed and they will be linked with the secondary and tertiary canals.

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



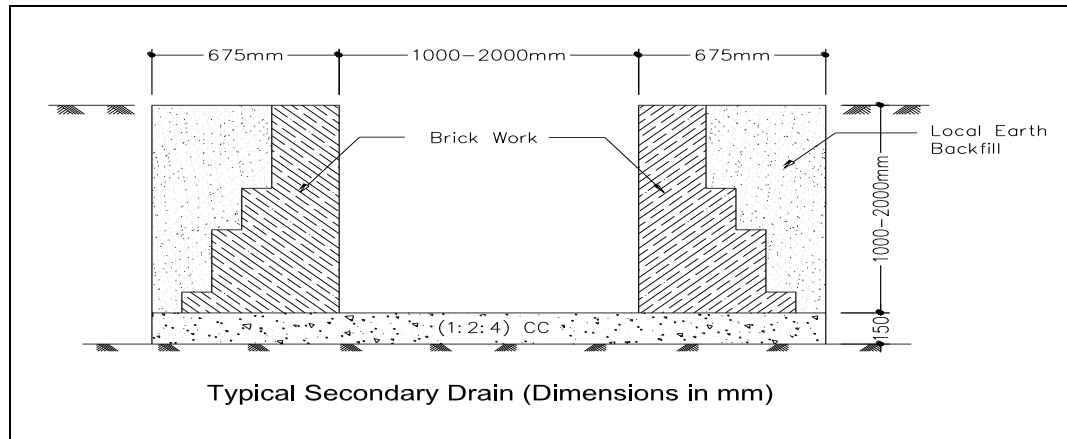
A schematic diagram showing the origin of Tertiary, Secondary and Primary drains and their destinations to the outfall river, presented above, are also presented here.



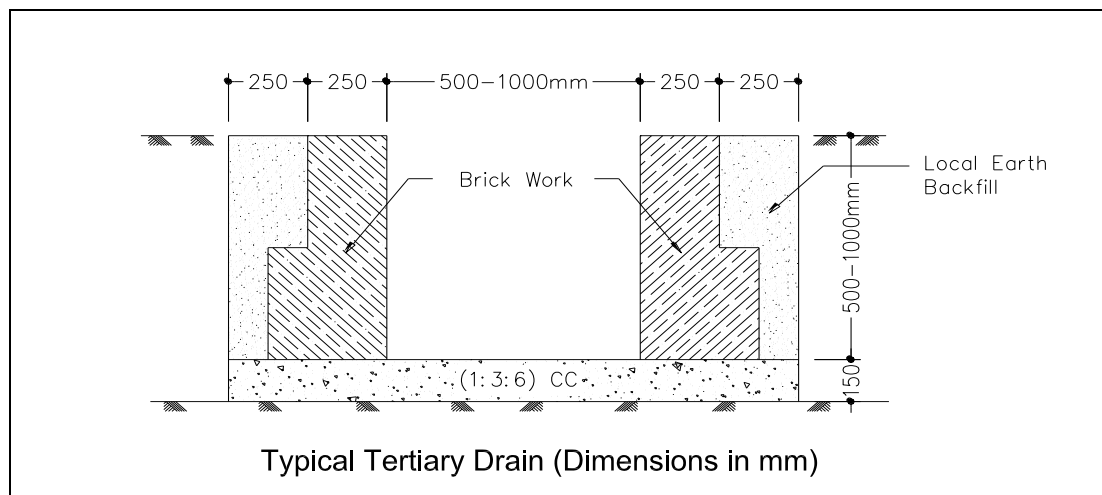
Schematic diagram of Tertiary, Secondary and Primary drains

**Secondary Drain:** Secondary drains collect discharge from tertiary drains. One secondary drain may receive drainage discharges from several tertiary drains in its course. Size and capacity of secondary drain is much bigger than tertiary drains; its catchment area is much bigger than tertiary drain. Like tertiary drain, it may run parallel to bigger roads.

Secondary drains may run along and through the middle of its storm water contributing area. The typical cross-section, size and shape, and its construction material are shown below.

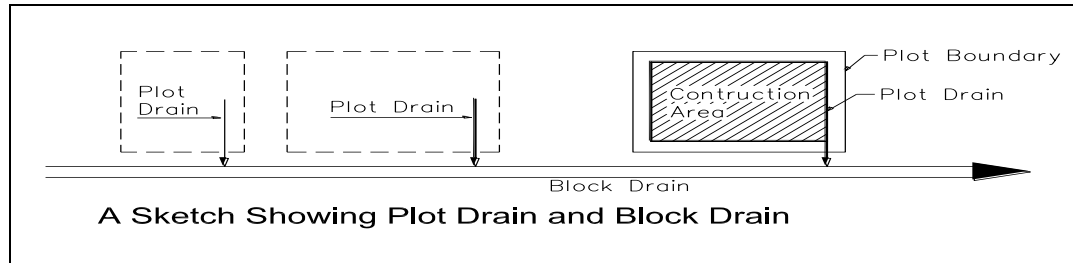


**Tertiary Drain:** Tertiary drain carry run-off or storm water received from the above mentioned plot drains and block or Mohallah drains. Their catchment area or storm water contributing area is bigger than Mohallah drains. In most Paurashava areas it is difficult to find such naming or classifications.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





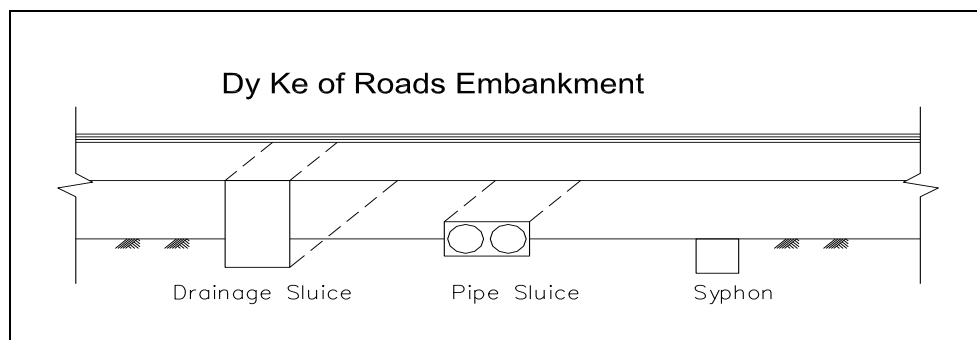
**Plot Drain:** Plot drains are provided around a building on a plot. In most cases, the drain is made of bricks and is rectangular in shape that can carry storm water generated in the plot and from the building. Plot drain is connected to the Block or Mohallah drain. The sketch below gives an impression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



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

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

However, storm water from rainfall-runoff within the area causes localized flood, drainage congestion and submergence. Sketch below shows a few of such structures. A schematic view of drainage sluice, pipe sluice and siphon on embankment, which relieve drainage congestion presents below.



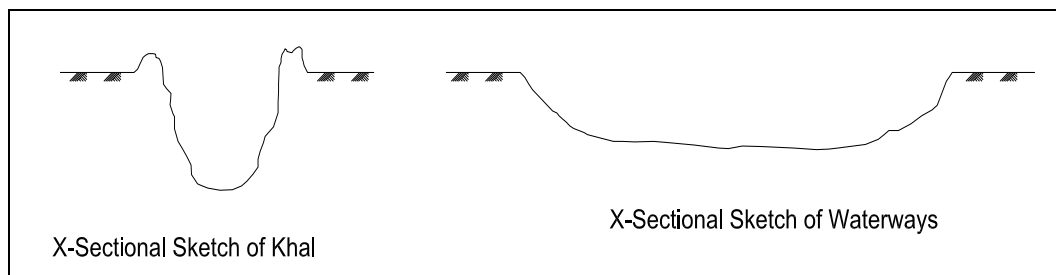
Rainfall is the source of storm drainage water irrespective of urban or rural catchments. Average annual rainfall in Kalkini is about 2000mm. After infiltration, deep percolation and evaporation is about 50% of this rainfall water takes the form of drainage water for semi-urban and urban areas.

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

Regulators also serve the similar purpose as sluice gates; however the size of regulators is much bigger than sluice gates. Regulators may have control gates in the countryside and in the riverside. Drainage of water to the river or flashing of water into countryside are possible by operating simultaneously countryside and riverside mechanical gates. Navigation lock sometimes is provided on the flood embankment to allow boat and ferry passages from the river and from the countryside. It is a simple structure with bigger chamber and large lift gates both at riverside and countryside. By operating these gates, boats and river crafts can be transferred from the river to countryside and vice versa.

**Reservoirs:** Large tanks, ponds, Dighis, lakes, etc. serve as immediate detention areas for storm water. Those structures are man-made and also natural; may be privately owned or government-owned or khas land. These structures function as drainage relief and source of water for emergency use, fisheries, duckeries, environment and nature preservation. For every mouza such reservoir is available. Physical feature survey maps and field survey maps (tank, pond and reservoir) show the existence of reservoirs and database shows their dimensions. Those structures should not be disturbed or removed by physical interventions by fillings or other means rather should be properly maintained and preserved.

**Drainage Khals and Waterways:** Khals and waterways are natural channels and act as drainage elements. In every mouza more or less such natural channel, khals and waterways carry the excess storm water to the connecting river lying further in the downstream. Sometimes old and silted-up khals are re-excavated to improve drainage efficiency. Most of the natural khals carry the local storm water particularly runoff from the Mouza / Mouzas those it passes through. Khals are narrow and deep in cross-sections; on the other hand waterways are shallow and wider. Physical feature survey maps, field survey maps (river, khal / drainage) show the drainage khals and waterways and their database shows the dimensions. The sketches below show the sectional view of khals and waterways.



### 12.3.2 Proposal for Improvement of the Existing Drain Networks

A wider scope for construction of a drainage system may be provisioned in the Paurashava. At least central areas are open for such development immediately and other areas may be followed for projected period as designed in the plan. The Paurashava is a barren field for imposing drainage system. The principles required for drainage plan are available in the area. Land slope, nearness of the natural drainage, sparse population density and soil condition are in favour of drainage construction.

**Drainage corridors:** If a drainage network has to be installed, the drainage originating throughout the Paurashava would be carried by means of surface drains and culverts. These should be accommodated within road reserves.

**General location required:** For sewerage treatment plant, large plot will be needed, preferably on outskirts of the Paurashava. For sewerage pumping station, small plots throughout the Paurashava will be needed and a system should be introduced.

**Maintaining of land slope:** Important component of the drainage network is land slope, which was not maintained during the construction of existing drains. The slope of the Paurashava is found towards east and southeast. Slope of all drains should maintain this direction.

#### 12.3.3.1 List of Proposed New Drains

For the removal of existing drainage congestion and provisioning of effective drainage system, a number of new drains have been prescribed. Those drains are a part of drainage system and another part is the natural canals and river. In the Paurashava, existing length of the drain is 5.35 km. and more 110 km. drain is being added as a proposal. At present, no drain is found in the Ward No. 4, 5, 6, 8 and 9. To develop a network, all Wards have been considered and in some places emphasize has given providing on missing links rather than new.

**Map 12.3: Proposed Drainage and Flood Control Components**



**Table 12.10: List of proposed new drains**

Drain Id	Drain Type	Length (m)	Phase
PD06	Primary	2728.720	1st Phase
PD05	Primary	1495.478	3rd Phase
PD04	Primary	1681.282	1st Phase
PD03	Primary	1519.470	1st Phase
PD02	Primary	1576.595	3rd Phase
PD03	Primary	412.994	1st Phase
PD01	Primary	1.099	3rd Phase
PD03	Primary	1481.639	1st Phase
TD149	Primary	2113.725	1st Phase
TD148	Primary	2285.245	1st Phase
TD147	Primary	1012.187	1st Phase
TD146	Primary	1986.784	1st Phase
TD145	Primary	951.057	1st Phase
TD144	Primary	2177.955	1st Phase
TD143	Primary	738.406	1st Phase
TD142	Primary	351.423	1st Phase
TD154	Primary	2368.917	1st Phase
TD140	Primary	1062.798	1st Phase
TD154	Primary	1979.953	1st Phase
TD138	Primary	960.450	1st Phase
TD137	Primary	1017.584	1st Phase
TD136	Primary	1729.250	1st Phase
TD135	Primary	1045.142	1st Phase
TD141	Primary	1556.726	1st Phase
TD150	Primary	1134.900	1st Phase
TD152	Primary	2825.261	1st Phase
TD153	Primary	2526.401	1st Phase
TD139	Primary	1536.619	1st Phase
TD151	Primary	1506.096	1st Phase
TD149	Primary	1037.491	1st Phase
TD145	Primary	466.337	1st Phase
PD04	Primary	1319.401	1st Phase
TD154	Primary	289.071	1st Phase
TD144	Primary	838.442	1st Phase
TD144	Primary	1253.384	1st Phase
	Total	48968.282	
SD11	Secondary	1510.401	1st Phase
SD10	Secondary	1772.032	1st Phase
SD09	Secondary	1980.065	1st Phase
SD08	Secondary	1725.728	2nd Phase
SD10	Secondary	190.764	1st Phase
SD10	Secondary	0.540	1st Phase
SD10	Secondary	983.041	1st Phase
	Total	8162.571	
TD13	Tertiary	684.047	1st Phase
TD14	Tertiary	507.201	1st Phase
TD15	Tertiary	3080.457	1st Phase
TD16	Tertiary	657.961	1st Phase
TD17	Tertiary	1065.771	1st Phase
TD18	Tertiary	738.528	1st Phase
TD19	Tertiary	702.155	3rd Phase
TD20	Tertiary	369.766	3rd Phase
TD21	Tertiary	404.158	3rd Phase
TD22	Tertiary	360.794	3rd Phase
TD23	Tertiary	168.252	3rd Phase
TD24	Tertiary	253.233	3rd Phase
TD25	Tertiary	637.490	2nd Phase
TD26	Tertiary	822.180	1st Phase

TD27	Tertiary	212.538	3rd Phase
TD28	Tertiary	796.594	3rd Phase
TD29	Tertiary	255.787	3rd Phase
TD30	Tertiary	512.763	3rd Phase
TD31	Tertiary	516.281	2nd Phase
TD32	Tertiary	623.106	2nd Phase
TD35	Tertiary	483.058	3rd Phase
TD36	Tertiary	692.777	3rd Phase
TD37	Tertiary	522.305	3rd Phase
TD38	Tertiary	515.057	1st Phase
TD41	Tertiary	407.574	3rd Phase
TD42	Tertiary	21.890	3rd Phase
TD43	Tertiary	499.929	3rd Phase
TD45	Tertiary	7.391	3rd Phase
TD46	Tertiary	320.796	3rd Phase
TD47	Tertiary	213.404	3rd Phase
TD48	Tertiary	325.485	1st Phase
TD50	Tertiary	1058.963	1st Phase
TD51	Tertiary	29.887	1st Phase
TD53	Tertiary	387.493	3rd Phase
TD54	Tertiary	469.013	3rd Phase
TD55	Tertiary	544.244	3rd Phase
TD56	Tertiary	454.270	3rd Phase
TD57	Tertiary	787.761	3rd Phase
TD58	Tertiary	512.512	1st Phase
TD59	Tertiary	192.298	3rd Phase
TD60	Tertiary	140.873	3rd Phase
TD61	Tertiary	141.349	3rd Phase
TD62	Tertiary	415.605	3rd Phase
TD119	Tertiary	65.295	3rd Phase
TD64	Tertiary	288.714	3rd Phase
TD65	Tertiary	913.390	3rd Phase
TD132	Tertiary	976.385	3rd Phase
TD68	Tertiary	8.415	1st Phase
TD70	Tertiary	11.312	3rd Phase
TD71	Tertiary	353.442	3rd Phase
TD72	Tertiary	230.777	3rd Phase
TD74	Tertiary	61.553	1st Phase
TD75	Tertiary	374.861	3rd Phase
TD76	Tertiary	529.296	3rd Phase
TD77	Tertiary	357.954	1st Phase
TD78	Tertiary	697.493	3rd Phase
TD79	Tertiary	1275.942	1st Phase
TD80	Tertiary	704.739	3rd Phase
TD81	Tertiary	267.625	3rd Phase
TD82	Tertiary	854.374	3rd Phase
TD83	Tertiary	330.794	3rd Phase
TD84	Tertiary	315.361	3rd Phase
TD85	Tertiary	1117.232	2nd Phase
TD86	Tertiary	433.602	3rd Phase
TD88	Tertiary	133.665	3rd Phase
TD89	Tertiary	659.696	3rd Phase
TD93	Tertiary	151.073	3rd Phase
TD94	Tertiary	427.513	2nd Phase
TD95	Tertiary	12.743	2nd Phase
TD96	Tertiary	3.798	2nd Phase
TD97	Tertiary	392.716	2nd Phase
TD98	Tertiary	352.882	2nd Phase
TD99	Tertiary	49.361	3rd Phase
TD100	Tertiary	266.142	3rd Phase

TD101	Tertiary	349.962	3rd Phase
TD102	Tertiary	1124.768	3rd Phase
TD103	Tertiary	648.222	3rd Phase
TD104	Tertiary	540.185	3rd Phase
TD111	Tertiary	806.510	3rd Phase
TD112	Tertiary	699.731	3rd Phase
TD113	Tertiary	399.113	3rd Phase
TD114	Tertiary	283.367	3rd Phase
TD115	Tertiary	792.595	2nd Phase
TD117	Tertiary	824.782	2nd Phase
TD123	Tertiary	868.547	3rd Phase
TD124	Tertiary	701.007	3rd Phase
TD125	Tertiary	666.769	3rd Phase
TD128	Tertiary	776.415	3rd Phase
TD129	Tertiary	238.547	2nd Phase
TD38	Tertiary	0.988	1st Phase
TD38	Tertiary	0.698	1st Phase
	Total	44853.347	
	Gross Total	101984.200	

### 12.3.3.2 List of Infrastructure Measures for Drainage and Flood Control Network

There are altogether 91 bridges (RCC) and 52 culverts (RCC) in the Paurashava. Bridges are found in all the Wards and highest number is found in the Ward No. 7. Ward No. 5 and 6 is preserved 3 and 7 bridges respectively. Thirteen bridges are found in the Ward No. 8. RCC Box culvert is found in all the Wards and highest in the Ward No. 1. Those bridges and culverts are located on the canals and drainage channels. The study area is flood prone area. Water logging is common, dyke is an important issue for this Paurashava, but there is no dyke or embankment in the Paurashava.

Except the above infrastructure, more 1 bridge will be needed on different proposed roads as presented in the map. Two sluice gates have been proposed to control intrusion of river water through the canals. About 8 km. road cum embankment will be needed on the western part of the Arialkha River for prohibiting flood water intrusion from eastern part to the western part of the Paurashava.

**Table 12.11: Proposed infrastructures for drainage and flood control**

Name of infrastructure	Existing (No.)	Proposed (No.)
Bridge	91	1
Culvert	52	23
Sluice Gate	0	2
Flood Wall	0	
Road cum Embankment	0	8 km.
Flood Embankment	0	

## 12.4 Plan Implementation Strategies

### 12.4.1 Regulations to Implement the Drainage and Flood Plan

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



1. Section 3 of the **Acquisition and Requisition of Immovable Property Act, 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 Act, 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 Act.
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) Act, 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 Act. The government approves project for DPHE mostly for the improvement of drainage and sanitation facilities in urban areas.

#### 12.4.2 Implementation, Monitoring, Evaluation and Coordination of the Plan

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

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

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

**Implementation through Development Control:** Landuse zoning is one of several methods of plan implementation to be considered. In all cases where some form of

development, landuse control may be applied; careful consideration requires the following ideologies:

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

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

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

- increased 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 be needed.

### **Evaluation**

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

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

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

### **Co-ordination**

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

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

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

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

## **12.5 Environmental Management Part**

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

### **12.5.1 Goals and Objectives**

Based on the information and data on the air, water, noise, soil, drainage congestion, river erosion, garbage disposal and industrial and clinical wastes an effective and action oriented plan is required as prescribed in the ToR. Preparation of environmental management plan is the ultimate goal of this study.

### **12.5.2 Methodology and Approach to Planning**

Environmental survey has conducted following the standard methods and procedures to determine environmental pollutions. Elements of pollutions of environment are air, water, land and noise for the development of urban areas. The Consultants have taken necessary assistance and information from the Paurashava Mayor, Councilors, Engineers and other concerned officials as well as the general inhabitants to determine pollution in air, water, land and noise. Based on the information and data collected from the field and secondary sources, detailed report has been prepared. Data collection format and questionnaire was approved by the PD of UTIDP, LGED. The data collection procedure incorporates discussion meeting with the Paurashava Mayor, Councilors and other Paurashava representatives. Discussions were also made with other GOs like DPHE, BADC, etc. and NGOs representatives working in the Paurashava.

### 12.6.1 Existing Environmental Condition

The Paurashava is a part of greater Faridpur district. Some information has collected from secondary materials and they are on geology, soil and sub-soil condition, climate, temperature, humidity, rainfall, wind direction and hydrology. Other relevant information is being collected from field survey and they are mostly on the environment pollution. Those information presents sequentially in the following paragraphs.

### 12.6.2 Geo-morphology

**Geology, Soil and Sub-soil Conditions:** Soil of the Zila is mainly formed by the very young Ganges meander flood plain and the mixed young and the older Ganges meander flood plain. The northern and eastern parts of the Zila are covered by grey silty clay of the active and very young Ganges meander flood plain. Central and southern parts of the Zila are mainly formed of brown silty clay of the mixed young and the older Ganges flood plan. Northern part of the Zila is less productive and is mainly used for Aus paddy.

In the Paurashava, sub-soils are being eroded naturally and the soil varies from place to place and composed of clay to fine sand from 0-40 ft depth, fine sand to very fine sand 40-160 ft, fine sand to medium sand 160-260 ft. Medium sand to coarse sand is available from 260 ft to 380 ft depth and in rest of the depth are hard clay, fine sand and coarse sand formed entirely by the deltaic action of the Ganges, which brought mud and limestone from Himalayas.

To a great extent, soil of the Paurashava is uniform in character. Only variation observed is in greater or smaller admixture of sand, silt and clay in grayish and dark gray colours. Along the riversides, it is found that the percentage of sand is higher and in the areas where deltaic action has ceased is lower. The load bearing capacity of this soil is very poor.

Soil types, strength and density characteristics based on Standard Penetration Test Values (N) have been mentioned for the different types of deposits at various depths.

Cohesive silt and clay layers having N-values less than 4 are very soft to soft and are not considered suitable to support any civil engineering structures without ground improvement. There are only a few areas near the waterfronts (of Arialkhan and Palardi Rivers) with such low N-values in the surface underlain by comparatively strong clay and sand soil strata. Sand layers with variable quantities of silt/clay having N-values less than 10 are considered very loose to loose. In a few locations such weak sandy layers occurred. They occurred usually in the surface layers.

The natural clay soils of investigated area can be divided into two major groups distinguished by their colours as under:

Red clay: Light brown to brick red and massive, containing ferruginous and calcareous nodules.

Mottled clay: Earthy grey with patches of orange, brown colour, massive and contains ferruginous and calcareous nodules.

Again, in the filled up areas (along the National Highway, from Dhaka to Barisal via Kalkini) there are mixtures of many coloured soils carried from different borrowing areas. Consistency of cohesive soil deposits (plastic silts and clays) and relative density of cohesion less soil deposits (non-plastic silts and sands) have been described in accordance with internationally accepted terms, which give approximate indication of strengths of the soil strata encountered at different depths.

**Table 12.12: SPT N-Values**

Consistency	SPT N-value	Allowable bearing Capacity (kPa)
Very soft	0–2	< 25
Soft	2–4	25–50
Medium	4–8	50–100
Stiff	4–15	100–200
Very stiff	15–30	200–400
Hard	> 30	> 400

For plastic silts and clays consistency terms like very soft, soft, medium stiff, stiff, very stiff and hard indicate the following approximate allowable bearing capacity of the different soil strata estimated on the basis of SPT N-values.

For cohesion less soil deposits (non-plastic silts and sands) relative density has been described with terms like very loose, loose, medium dense, dense and very dense on the basis of SPT N-values measured in the different cohesion less soils strata encountered within the explored depth of 15m. These relative density terms give the following approximate strength characteristics based on SPT N-values.

**Table 12.13: Strength Characteristics**

Relative Density	SPT N-Value	Estimated Shearing Angles	Strength Characteristics
Very loose	> 4	28°	Very poor
Loose	4–10	30°	Poor to fair
Medium dense	10–30	32°	Fair to good
Dense and Very dense	> 30	34°	Good to excellent

**Climate:** The climate regime of the study area is that of Faridpur which is similar to that of the remainder of the country. The cool and dry winter of December – February is followed by hot and showery pre-monsoon period of March – May and then a relatively

cooler but very wet monsoon season prevails during June – September. Again, a transitional humid and showery period follows up to the beginning of winter. From mid November the weather begins to be dry and relatively cool.

**Temperature:** Average maximum temperature varies between 24.5° C and 36.3° C and minimum temperature varies between 12.1° C (January) and 25.9° C (August). The hottest months are March, April, May, June, July and August. From December to February, Paurashava experiences cool periods when minimum temperature varies from 12.1° C (January) to 14.6° C (February).

**Humidity:** The planning area is situated in the tropical zone. Heavy rains are experienced during June – September with the movement of moist monsoon wind (April to October). Almost 80 percent of the total rainfall is recorded during June – October. Average annual rainfall of the area is about 1547 mm. Rainfall in the area is very much influenced by the southwestern monsoon. Due to northwestern effect substantial rainfalls are also recorded during March to May period. Winter is generally dry with little rainfall in the months of December and January.

The weather is hot and wet from March to May with occasional storms locally known as *Kalbaishaki* (Tropical Cyclone). During October and November the weather is generally fine with some wet and stormy days. The characteristic feature of the climate of the study area is the salt laden air throughout the year, especially when it blows from the sea at regular intervals as a result of diurnal change.

**Rainfall:** The Kalkini Paurashava has on an average, normal rainfall of 325.4 mm in the month of June which is highest among all other months. In September, it falls to 232.5 mm; again falling to 142.8 mm in October. From November to March, this rainfall varies between 6.0 mm to 45.2 mm. The rainy season begins in April / May and usually ends in the end of October. The highest number of normal rainy day is in July, called highest rainfall month. About 14 rainy days at an average in July, followed by 15 rainy days in August, 14 in June, 12 in May and September has been the characteristics of rainy day as the data reveals.

**Wind Direction:** In Faridpur district, general direction of the wind is same as Gangetic delta, south-west, changing to east towards the head of the valley for the greater part of the year, with a north and north-west direction during the month of April and May. It is observed that winds are stronger in summer in the months of April and May (3 to 6.5 knots) than in winter in the month of November and December (1.5 to 3.0 knots).

**Hydrology:** River, Canal / Khal and pond are the hydrological components of the Paurashava. Those components are occupying 8.69% (649.44 acres) land of the

Paurashava. The canals are linked with the river named Arialkha and Palardi. In dry season, most of those canals are using as agriculture land and in the rainy season they submerges lowlands of the Paurashava. The ponds are spottedly located around the Paurashava. Small numbers of them are larger than one acre. In dry season, ponds water are using for bathing and washing purposes. Canal water generally uses for irrigation purposes.

### **12.6.3 Solid Waste and Garbage disposal**

#### **12.6.3.1 Household Waste**

Dustbin is the only system for solid waste disposal from residence. Dustbin is located within walking distance in the Ward No. 1, 3, 6 and 7. About 21% residences of those Wards get dustbin facilities. There are four dustbins in the Paurashava, two within walking distance, one within 1 km to 2 km and one within 2 km. Most of the people walk (38%) for dustbin facilities followed bicycle (35%).

#### **12.6.3.2 Clinical/Hospital waste**

Existing health facilities are poor in number. There are 7 numbers of health centers in the Paurashava (three hospitals, two private clinics and two diagnostic centers). Ward No. 7 is rich in number in case of health services because, two hospitals and one diagnostic centre are located in that Ward. Another hospital is located in the Ward No. 9.

There is no arrangement for clinical waste management in the Paurashava. The clinics and hospital used to dump solid wastes here and there or nearby ditches. This activity may bring serious health hazard to the inhabitants specially the nearby dwellers.

#### **12.6.3.3 Industrial waste**

No industrial waste available in the Paurashava.

#### **12.6.3.4 Kitchen market waste**

Kitchen market waste is being dumped on the low lands available around the market.

#### **12.6.3.5 Waste Management System**

Solid waste collection and disposal in Kalkini Paurashava is the responsibility of Paurashava authority. The logistics for collection and disposal of solid wastes include 18 sweepers for collection and 1 garbage truck for transportation. Solid waste from the point of generation to the final disposal can be grouped into three functioned elements -

- Waste generation and storage
- Collection
- Final disposal



**Waste Generation and storage:** Households within the area are producing 3.5 tons of domestic solid wastes per day.

**Collection:** The waste collection is done in the following three stages:

- The residents themselves take domestic refuses from households to the intermediate dumping points.
- Street and drain wastes are collected and dumped at intermediate disposal points by the municipal sweepers and cleaners.
- Final collection from the intermediate points and its disposal to the dumping yard by the conservancy worker.

**Final disposal:** The authority used to dump in low lands on the basis of land owner's interest or nearest ditches.

#### 12.6.3.6 Latrine

Toilet system of the planning area is mostly categorized as pucca and katcha. In spite of this, Paurashava has a modest development of pucca toilets in government zones. Sewerage system has not been introduced on a trial basis as to their popularity and acceptance. Ownership of toilets varies widely in most of the Wards. Most of the households have their own toilets and at the same time there is joint toilets found in slum areas. Sanitary toilets or pucca toilets are comparatively good in all the Wards. Only 9% katcha toilet is found in the Paurashava and owner of those toilets are poor people.

#### 12.6.3.7 Industry

In total, 110 industries with six categories are in the Paurashava. Among those establishments, agro-based industries account about 75% and other industries 25% share of the total running industries. It reflects the general agrarian character of the Paurashava. All of those enterprises are proprietorship units meaning that private sector dominates the industrial sector.

Most of the industries (except chemical industry, pottery, ice cream factory, ice mill and saw mills) in the study area depend on raw materials available within the study area. The industrial output produces in the local market. It is also found that those establishments have problems and potentialities. Careful consideration will help to resolve those problems and adoption of necessary policy initiatives will help to flourish the existing units and draw more investors and entrepreneurs to set up new manufacturing industries, which will be based mainly on local raw materials.

#### 12.6.4 Brick Field

No brickfield is in the Paurashava premises.

### **12.6.5 Fertilizer and Other Chemical Use**

The fertilizer and chemical uses in the agriculture field for increasing agriculture production are Urea, Potash, Gypsum and Nitrogen Sulphate, Bashudin, Diazinon, Sumithion and Padan. Those chemicals are being contaminated with the surface water and create water pollution. Those chemicals and insecticides are creating water pollution of the Arial Khan and Palardi Rivers. For more details Chapter-8 of the Structure Plan (Environmental Issues in Agriculture Practice).

### **12.6.6 Pollutions**

#### **12.6.6.1 Water**

Water is considered polluted when it altered from the natural state in its physical condition or chemical and microbiological composition, so that it becomes unsuitable or less suitable for any safe and beneficial consumption. The used water of a community is called wastewater or sewage. If it is not treated before being discharged into waterways, serious pollution is the result. Water pollution also occurs when rain water runoff from urban and industrial areas and from agricultural land and mining operations makes its way back to receiving waters (river, lake or ocean) and into the ground.

In Kalkini Paurashava, there are 786 ponds, 644 ditches, 68 canals and 2 rivers as sources of surface water. Surface water pollution has found in the study area originating from the use of insecticide and chemical fertilizers in crop fields. Wash out by rain water from crop fields to nearest water sources with chemicals is causing water pollution. Cattle bathing and flow of waste water from domestic use discharge into the ponds, khals and river have also identified as reasons for surface water contamination. The Paurashava authority has yet not taken any initiatives to control surface water pollution.

Ground water pollution also exists in the Kalkini Paurashava. A large number of hand tubewells (in total 6500) are established all over the Paurashava area. Presence of iron and arsenic as pollutants in ground water are the reasons for such pollution. Not any initiative has been made by any local authority/ GOs/ NGOs to reduce arsenic problem.

#### **12.6.6.2 Air**

Air pollution is the introduction of chemicals, particulate matter, or biological materials that cause harm or discomfort to humans or other living organisms, or damages the natural environment, into the atmosphere.

Operations of shallow engine driven vehicles (Nochimon / Kariman) are responsible for air pollution. Those vehicles use diesel as fuel. Diesel Particulate Matter (DPM) includes diesel soot and aerosols such as ash particulates, metallic abrasion particles, sulfates and silicates. The small size inhaled particles may easily penetrate deep into the lungs with acute short-term symptoms such as headache, dizziness, light-headedness, nausea,

coughing, difficult or labored breathing, tightness of chest, and irritation of the eyes and nose and throat. Long-term exposures can lead to chronic, more serious health problems such as cardiovascular disease, cardiopulmonary disease and lung cancer.

There are 110 industries in the Paurashava. Among them, 3 chemical industries, 2 ice cream factory, 4 ice mill, 22 rice mill and 9 saw mills are polluting the air. Saw mills release wooden dust as effluent into the air and polluting the surroundings.

The rice husking mills used to boil them before husking. The mills use wood, rice husks or sawdust as fuel in boiling burners. Smoke and hot gases releasing through chimney create massive air pollution. During husking time, the mills release dust husks into the air and polluting the nearby environment. Those mills have not installed any treatment plant. The Paurashava authority has not yet taken any initiatives to install treatment plant in those industries.

#### **12.6.6.3 Sound**

Noise pollution is basically consists of unpleasant displeasing human, animal or machine created sound that disrupts the activity or balance of human or animal life. A common form of noise pollution is from transportation, principally motor vehicles. Other sources are car alarms, office equipment, factory machinery, construction work, audio entertainment systems, loudspeakers and noisy people.

In the Paurashava, shallow engine driven vehicles like Nochimon / Kariman are playing on roads as a mean of local transport. They are making above 700 trips throughout the Paurashava in a day. Engine generated sounds in their operational time on roads is a matter of nuisance as well as a source of noise pollution. The Paurashava authority has already noticed them to restrict their movements. Generated sounds from industry at their operational time are also a source of sound pollution existing in Kalkini Paurashava.

#### **12.6.6.4 Land Pollution**

Soil pollution is basically about contaminating the land surface of the earth through dumping urban waste matter indiscriminately, dumping of industrial waste, mineral exploitation and misusing the soil by harmful agricultural practices.

Soil is being polluted due to the extensive use of fertilizer in agriculture lands and water logging. Extensive use of fertilizer is changing the bio-chemical composition and the lands are losing their productivity day by day. At the same way, water logging for four months in a year is settling non decomposable materials on lands and the lands are being polluted. Water logging, over time leads to the soaking of soils, impeding agricultural production. The water applied in excess as a stock pollutant accumulates in the underground hydrological system and causes damage to production.

#### **12.6.6.5 Arsenic**

Ground water quality in the planning area is influenced by arsenic and iron. Water in most shallow aquifer is arsenic and all are contaminated with iron, not suitable for drinking purposes. Water collects from river and ponds for irrigation purposes. The lower deep aquifer is found at a depth of 220 m to 350 m. Deep aquifers with fresh water in the Paurashava are exploited to meet the demand of water for inhabitants but that is small.

#### **12.6.6.6 Other Pollution**

In the Paurashava, sub-soils are being eroded naturally and the soil varies from place to place and composed of clay to fine sand from 0-40 ft depth, fine sand to very fine sand 40-160 ft, fine sand to medium sand 160-260 ft. Medium sand to coarse sand is available from 260 ft to 380 ft depth and in rest of the depth are hard clay, fine sand and coarse sand formed entirely by the deltaic action of the Ganges, which brought mud and limestone from Himalayas.

#### **12.6.7 Natural Calamities and Localized Hazards**

##### **12.6.7.1 Cyclone**

A disaster is the tragedy of a natural or human-made hazard (a hazard is a situation which poses a level of threat to life, health, property or environment) that negatively affects society or environment. Disaster can be classified into two categories: natural disaster and man-made disaster. A natural disaster is the effect of a natural hazard (e.g. flood, volcanic eruption, earthquake or landslide) that affects the environment and leads to financial, environmental or human losses. Man-made disasters are disasters resulting from an element of human intent, negligence, or error, or involving a failure of a man-made system.

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

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

##### **12.6.7.2 River Erosion**

A disaster is the tragedy of a natural or human-made hazard (a hazard is a situation which poses a level of threat to life, health, property or environment) that negatively affects

society or environment. Disaster can be classified into two categories: natural disaster and man-made disaster. A natural disaster is the effect of a natural hazard (e.g. flood, volcanic eruption, earthquake or landslide) that affects the environment and leads to financial, environmental or human losses. Man-made disasters are disasters resulting from an element of human intent, negligence, or error, or involving a failure of a man-made system.

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#### **12.6.7.3 Flood**

Inundation has been measured within Paurashava on plinth and above plinth level. In this Paurashava flood (2007) reached plinth level and above plinth level. Moreover, it affects about 68% household of the Paurashava. Flood 2007 affects all the Wards. It affects Ward No. 1, 3, 4, 5, 6, 7 and 8 where various types of damages are alive. The respondents of Ward No. 3 said that due to flood 2007 death of household members (42%), injury of members (32%), loss of job (56%) and their property was damaged to some extent. Loss of property and crops are the highest in almost all the Wards. Crop loss was highest in the Ward No. 5 (49%) and loss of property in the Ward No. 8 (89%). In general property loss was 46% and crop loss was 20%. It is found that the Ward No. 1 and 3 are most vulnerable for flood.

#### **12.6.7.4 Earth Quake**

The Paurashava is not in earth quake zone.

#### **12.6.7.5 Water-Logging**

Inundation within Paurashava areas is experienced in the months of Srabon to Ashwin. Due to influences of rainfall during monsoon, usually most of the Wards suffer with water-logging. Rainy season is the season when problems of water logging begin. Generally, during rainy season, the water overflows on the both sides of the canals up to 3.0 feet. In the months of Srabon to Ashwin, the water rises with a height of 4-5 feet. This internal flood or water-logging is experienced within the Ward No. 2, 4, 5, 6, 7 and 8

during peak monsoon time with high rainfall for long duration. The water-logged areas are found along roads, ditches and ponds within Paurashava. In the Ward No. 2 the location is a certain part of Char Pangasia, Char Thengamara and Patabali (part). In Ward No. 4 the water-logged area is Char Bibhagdi, Char Jhautala and Char Krisnanagar. In Ward No. 5, it is in Darirchar Laxmipur (part), Char Sadipur and Uttar Krisnanagar. In Ward No. 6, it is in Char Kasimpur, Char Laxmipur and Kastagar. In Ward No. 7 and 8, water logging occurs in Rajdi (part) and Dakkhin Janardandi (part) mouzas respectively. Water-logging situation is a major issue for this Paurashava which requires be resolved immediately through Paurashava Master Plan.

There is no arrangement for clinical waste management. The clinics, hospitals and diagnostic centers used to dump solid wastes here and there or nearby ditches and dustbins. This activity may bring serious health hazard to the inhabitants specially the nearby dwellers.

#### **12.6.7.6 Fire Hazard**

No fire hazard record is found in the Kalkini Paurashava. With the increase of population, chances of fire incidence may increase for offices, institutions, market places and industries. Electric short-circuit is mainly responsible for fire hazards in urban area. Human error may also cause incidence of fire hazard sometimes.

#### **12.6.7.7 Other Hazards**

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

### **12.7 Plan for Environmental Management and Pollution Control**

#### **12.7.1 Proposals for Environmental Issues**

In Kalkini Paurashava, noise pollution is occurring by three wheelers and sound generated from saw mills and rice husking mills. Water contamination is observed as “Arsenic” threat. Air pollution is caused by dust emitted from saw mill, rice hushing mills and furniture shops. Also flood water and water-logging are creating health hazards. Dysentery, diarrhea, etc. diseases occurs due to flood and Water logging. Habitual inundations, especially in monsoon, due to external floods from canals are another threat to environment. These above varies are extremely important uses of concern for the Paurashava. Pragmatic planning / solution and proper Drainage Master Plan are very pertinent issues which will be of utmost importance in planning the Kalkini Paurashava.

However, implementation of activities like roads, drainage, bridge / culverts, housing and industrial establishments and bazars will radically change the natural topography and land use pattern. The agricultural land will be converted into urban and semi-urban area. Existing scenic beauty will disappear; water bodies will be lost and general slope will be diminished for earth filling due to urbanization. Therefore, in the process of preparation of Master Plan, Structure Plan and Ward Action Plan, consideration of those factors will be made for keeping the natural environment.

For a better living environment above environmental phenomenon should be considered with the systematic planning principles and regulatory measures. With these views, people's awareness should be increased about the fair living environment through different public activities. Arrangement of land uses should be provisioned for all the public and private organizations as their necessities.

#### **12.7.1.1 Solid Waste Management Plan**

Solid waste management is a crucial problem for the Paurashava. The Kalkini Paurashava does not have the sufficient capability to handle the huge waste generated by the residents due to narrowness of roads, lack of local collection sites stand as impediments to waste management. Particularly in informal/spontaneous areas due to existence of narrow roads the garbage trucks can not enter for removal and transshipment of the garbage. In most places there is no road side open space for locating garbage bins. Garbage is often found to be disposed off on low lands. As a result rotten garbage spoils the local environment of the area posing health hazard of the local residents. No dustbin is in the Paurashava whereas the daily waste produced is about 3.5 tons and most of those garbages throw to the nearby low lands.

For an efficient solid waste management system, it is recommended to engage, CBOs, NGOs and micro enterprises on contract basis for collection and disposal of solid waste and street sweeping.

#### **12.7.1.2 Open space, Wet-land and Relevant Features Protection Plan**

- The authority named Bangladesh Sports Council in collaboration with the Paurashava authority may construct the stadium. The stadium should use regularly with various programs.
- The land prescribed for tourism development, Bangladesh Parjatan Corporation should be the responsible authority to implement those tourism components. Domestic tourists should be emphasized rather than international in considering establishment of tourism components. Rainwater harvesting will be the major component of this tourism site. This sector can improve economic capability of the Paurashava dwellers rapidly.

- The embankment cum road proposed along the western part of the Arialkhan and Palardi Rivers and two sluice gates will control flood water intrusion. As a result, single-crop land (remain wet land in nine months of a year) available in the southern part of the Paurashava will be turned into triple-crop land.

### **12.7.1.3 Pollution Protection Proposals**

#### **12.7.1.3.1 Industrial / Brickfield**

In total, 110 industries are in the Paurashava and among them 53 are poultry farm. One dairy farm, 3 chemical industries, 12 potteries, 2 ice cream factory, 4 ice mill, 3 oil mill, 22 rice mill and 9 saw mills are the total industrial scenarios. The industrial activities cover 42.69 acres and 0.57% land of the study area. Local woods are being processed in the saw mills and locally produced paddy are using in the rice mills. Those industries have been established all over the Paurashava. Location of those industries will be rearranged and grouped in some selected areas. After construction of Padma Bridge at Maowa point, number of agro-based industries will be increased. A significant percent of air pollution is caused by the industrial establishments. The steps will be taken to protect pollution through industries are:

- All the industries are in mixed-use areas. Some of them will be re-arranged and shifted to the proposed industrial site.
- A green buffer will create around the proposed industrial site; it will separate the area from adjacent landuses and at the same time, environment will be livable.
- In future, the proposed industrial site will also be identified as a site for polluting industry (as identified by the Directorate of Environment). In that, provision of recycling plant should be attached with the individual industry.
- Any brickfield should not be allowed in the Paurashava jurisdiction.

#### **12.7.1.3.2 Air / Water / Land / Sound**

For a better living environment above environmental phenomenon should be considered with the systematic planning principles and regulatory measures. With these views, people's awareness should be increased about the fair living environment through different public activities. Arrangement of landuses should be provisioned for all the public and private organizations as their necessities.

The Paurashava is rural based urban area. River, canal and pond water are still below the danger level of pollution. Let it should not be increased. Still people awareness is possible for reducing contamination of ground water. People may aware about the use of pesticides in agriculture field, solid waste disposal in a systematic manner and improved sanitation facilities.

#### **12.7.1.3.3 Other Pollution**



At present, control of urbanization and dumping of clinical wastes are the major concern of environment pollution of the Paurashava. Controlled urbanization according to this plan may remove the pollution through urbanization. Control on area / use density, height density and bulk density are the means of pollution protection through urbanization. A specific site within the compound of health services should be provisioned, thus pollution through clinical wastes will be controlled.

## **12.8 Natural Calamities and Regular Hazard Mitigation Proposals**

### **12.8.1 Protection Plans Addressing Natural Calamities**

**Change in Topography and Mitigation:** The main ground slope of the study area is southeast and southwest direction. Natural topography of the Paurashava has already been changed for urbanization. Implementation of Master Plan activities like roads, drainage, bridge/culvert, housing and industrial estates, bazars and growth centers will radically change the natural topography and landuse pattern of the study area. Agricultural area will be converted into urban and semi-urban area. Present green scenic beauty will disappear, water bodies will be lost and general slope will be diminished for earth filling due to urbanization.

1. Careful planning will be needed to minimize the change of topography.
2. Avoid water bodies during planning of roads, housing and industrial estates.
3. Practice good architectural/engineering design during planning of housing estates, buildings and the intersections of main roads.
4. Enhancement of plantation and gardening to increase the scenic beauty of the Paurashava.
5. Preserve the Beels, khals as lakes with demarking buffer distance.

**Landuse Change and Mitigation:** Major portion of the study area is rural setup, with predominance of agricultural landuse. However, urban and semi-urban landuses are observed in the Paurashava and its surrounding areas. With implementation of the Master Plan, rural setup and agricultural landuse pattern will be changed radically into urban landuse type.

1. Careful planning is necessary to reduce change of agricultural landuse and rural setup.
2. Keep water bodies and productive agricultural land free from urban development as long as possible. Vertical development may be encouraged rather than horizontal.
3. Economic use of land should be emphasized.

**Drainage Congestion and Mitigation:** Drainage congestion may increase further with urban sprawl development. Faulty design, solid waste and rubbish dumping, encroachment and un-authorized structures, siltation, lack of renovation and re-

excavation are the main causes of drainage congestion. Drainage system that exists in the study area is not well enough to carry the surface run-off properly. The outlets of these drainage networks are mostly connected with the natural channels or khals. These khals will be silted due to siltation; as a result, drainage congestion generates. And thus many areas are subjected to water-logging during the heavy rainfall causing inconvenience to the people of the area.

1. Make proper drainage network in new area considering the slope and local topographical condition.
2. Remove all unauthorized structures, which developed on drainage structures.
3. Prohibit the people in dumping of rubbish and solid waste in drain.
4. Regular cleaning and maintenance by the concerned authorities.
5. Demarcation of water bodies, which can act as retention pond to avoid water logging from heavy rainfall.
6. Demarcation of Right of Way to preserve the natural channels.

**Groundwater Table Declination and Mitigation:** Fall of groundwater table is a common phenomenon in the study area during dry period (February-May). With expansion of urbanization and industrialization through the Ward Action Plan, the groundwater table may further fall if present tradition of using groundwater is continued.

1. Introduce rainwater harvesting system and use in the planning area.
2. Stop land filling of ponds and water bodies to maintain the groundwater level through recharge and leaching process.

**Groundwater Pollution and Mitigation:** Groundwater pollution due to manganese, iron and hardness is a major problem of the study area. With expansion of urban area, more dependency on groundwater sources may increase the pollution level of sub-surface water.

1. Use surface water of Palardi River for supply water.
2. Introduce rainwater-harvesting system.
3. Reduce dependency on groundwater.
4. Preserve surface water in ponds, khals, Beels, ditches and rivers for irrigation.

**Noise Pollution and Mitigation:** Although there is no data available on noise pollution of the study area, however, it seems that present noise level does not exceed the Bangladesh Standard. More noisy area may be the Bus Terminal area and Industrial and Market area. Hydraulic horn of buses and rickshaw bells are the main noise sources in the study area. However, some noises also generate during piling and construction works. Besides, welding workshops, saw mills, musical instruments and blacksmiths are also common sources of noise pollution in urban areas. With expansion of urban area, the

noise pollution will be increased for increasing number of motor vehicles, market places, industries, etc.

1. Stop using hydraulic horn in buses, trucks and other motor vehicles.
2. Declare some areas like hospitals, schools, parks, etc. as silent zone.
3. Control abnormally high noise from saw mill, old machines should be repaired or replaced.
4. Foundation of machines should be specially prepared to reduce noise.
5. Special type of silencer may be attached with the machines to reduce noise.
6. Welding and blacksmith workshops can be fenced with glasses to protect the passersby from possible pollution effects.
7. People constantly working in welding and blacksmith workshops should wear earplugs and glasses. Regular medical checkups can be carried out to identify possible health problems.

**Air Pollution and Mitigation:** Present climatic condition of the study area is sub-tropical monsoon. With the implementation of Master Plan this climatic condition is expected to continue if further global climatic change does not occur. However, rainfall may slightly decrease in the study area for cutting of trees and diminishing of green vegetation for urban development. Trees and green vegetation keep environment cool and enhance precipitation and rainfall. Temperature may remain same as present. Urban development keeping vegetation, plants, water bodies and new social forestation in homesteads, educational organizations, roads, embankment and parks will help maintain the climatic condition same as present.

Air-pollution is not a serious problem in the study area. Vehicular emission is also insignificant in the area. Industries are the main sources of air pollution. However, the air pollution will be increased in near future with increase of motor vehicles and industries. With the implementation of Master Plan more industrial zones will be developed which will also induce air pollution in the planning area.

1. Use catalytic converter in buses, trucks, taxis and tempos.
2. Use CNG instead of petrol and diesel.
3. Impose ban on movement of sand carrying trucks and conservancy vehicles during office period.

**Loss of Biodiversity and Mitigation:** Urbanization like roads, infrastructure development, housing, commercial places, industrialization, etc. will replace the existing natural green environment to man made environment. Trees will be cut down, water bodies will be filled up and polluted; sugarcane, paddy, banana, papaya and vegetable production will be reduced and mango garden and bush will disappear for urban expansion in new area.

Wild animals, birds and fishes will lose their habitats and as a result a big loss of biodiversity will happen for urban expansion.

1. Avoid critical ecological area and refugee sites from development activities.
2. Aware people for keeping some trees and bushes around the homesteads.
3. Increase tree plantation in roadsides and homesteads.
4. Preserve the Beels for aquatic birds and fishes and some bush areas as wildlife preservation sites.

**Parasitic Diseases and Mitigation:** Parasitic diseases like dengue, malaria and filaria are not common in the planning area. However, with the expansion of urban area, the prevalence of these diseases may increase in the project area. During last 3 to 4 years, the country faces dengue problem although this problem was negligible. This problem may happen also in the Paurashava for increasing urbanization and industrialization.

1. Regular mosquito eradication program in the project area.
2. Dengue carrying mosquitoes live in fresh water of tire, cans, bottles and flower tubs. Segregation of old tires; cans and bottles are required before dumping.
3. Remove additional water of flower-tubs and refrigerator cans regularly.
4. Improve drainage system and remove waterlogged areas in the project.
5. Regular cleaning of drain and removal of water hyacinth and other aquatic plants are required from ponds, ditches, khals and Beels.
6. Use mosquito net during sleeping at both night and daytime.
7. Increase people's awareness on parasitic diseases and mosquito control.

#### **12.8.2 Protection Plan Addressing Regular Hazards**

Most of the natural canals and water courses will be preserved and maintained. The ponds larger than 0.15 acres should be preserved as a water reservoir.

To protect northern and southern part from annual flood, a road cum embankment including two sluice gates will be needed and these will be controlled by the Water Development Board.

For the removal of drainage congestion, sufficient number of bridges and culverts should be provisioned during construction of roads.

Indiscriminate land filling for expansion and construction of residential areas and buildings should be controlled with the imposition of agriculture policy.

#### **12.8.3 Protection Plan Addressing Encroachment and Other Relevant Issues**

As a measure of protection from encroachment restrictive buffer zone will be created on both sides of natural canals, rivers and other watercourses (if necessary). Walkways and plantation will be needed for the protection of those buffer zones.

Formation of appropriate legislation on solid waste management will be necessary. People encroaches canal and river through dumping of solid wastes. Encroachment on road, canal and river should be removed as early as possible with the formation of joined collaboration committee. This committee may be formed with the members from Paurashava, LGED, RHD and WDB.

Using of waste as an unutilized resource and assisting in recycling of waste for conservation of resources and protection of environment.

Introduces environmental education especially sanitary habits in school curriculum.

## **12.9 Plan Implementation Strategies**

### **12.9.1 Regulations to Implement the Drainage and Flood Plan**

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

Section 3 of the **Acquisition and Requisition of Immovable Property Act, 1982** is needed for acquisition of land in view to construct environmental components. The authority, according to the demand, will apply to the Deputy Commissioner for such acquisition.

Section 4 of the **Conservation of Environment Act, 1995** have prescribed duties and responsibilities of the Director. Most of those responsibilities are on the control of pollution.

Section 28 (1, 2 and 3) of the **Forest Act, 1927** has prescribed regulations on village forest, which is necessary for the formation of village / Paurashava forest.

Section 5 of the **Playfield, Open space, Garden and Natural Tank in Urban Areas Preservation Act, 2000** will be needed for the preservation of playfield, garden, open space and natural tank of the Paurashava.

**Water Hyacinth Act, 1936** was enacted for preventing the spread of water hyacinth in Bangladesh and for its destruction. It is said in the section 5 that, no person shall grow or cultivate water hyacinth in any garden or in any ornamental water or receptacle. Again, according to the section 8(1) said, with a view to facilitating the discovery or destruction of water hyacinth, an Authorized Officer may, subject to any rules made under this Act, by a notice served in the prescribed manner, direct an occupier of any land, premises or water within a notified area to cause-

- a) any branches of trees or shrubs on any such land or premises which overhang the edge of any river, stream, waterway, ditch, marsh, bil, lake, tank, pond, pool or pit to be cut back and any undergrowth or jungle thereon to be removed from such edge, within a distance specified in the notice, or

- b) any vegetation appearing above the surface of any such water to be removed from the water, within such period as may be specified in the notice.
6. Section 7 of the **Water Resources Planning Act, 1992** will be needed for the development of water resources available in the Paurashava.

#### **12.9.2 Implementation, Monitoring, Evaluation and Coordination of the Plan**

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

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

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

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

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

- what will be the likely impact of the controls;
- how and by whom will the controls be administered and enforced.

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

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

- increased 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 ongoing and implemented projects is essential to keep the future course of action on the right track. An ongoing project should be regularly

monitored and handicaps identified to enable taking appropriate measures at the right time.

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

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

### **Co-ordination**

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

Provide pre-application advice to residents, consultants and developers about landuse management issues and application procedures for the submission of development applications.

Enforce planning and landuse management related legislation and zoning scheme regulations.

### **Issue of property zoning certificates**

Investigate and resolve landuse management complaints, illegal landuse and prosecuting contraventions.

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

In spontaneous areas, while all out people's co-operation is needed for project implementation; there will also be some elements of negotiation. Negotiation will be particularly needed in case of road widening projects. It will be a crucial task for Paurashava to convince the affected people to give up their land for road use. Efforts should be made to convince the land owners on the ground of enhancement of property value due to road widening. In case people refuse to offer land free of cost necessary arrangements may have to be made for payment of compensation. This process of



negotiation will be very critical, cumbersome and time consuming, and therefore, has to be handled with utmost care and patience. The best results can be accrued only by 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

## 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 Paurashava, to ensure that the plan is well considered and likely to be conducive to good health and well-being of the urban dwellers.

During the year 1984 to 2003, Urban Development Directorate (UDD) was prepared a series of Landuse/Master Plans for Upazila and Zila Shahars of Bangladesh as a part of decentralization effort of the government. Under that project, the Kalkini Upazila Shahar was planned but the project area considered in the plan was far away from the planning area considered in the Paurashava Town Infrastructure Development Project.

### 13.2 Analysis of Existing Condition and Demand of the Services

The Paurashava is too poor in development of urban services. With the development of physical condition of the Paurashava, substantial development will be needed for those services. Drinking water supply, sewerage and sanitation facilities and dumping of solid wastes should be emphasized as primary consideration. All the people (except 0.3%) are dependent on hand tubewell for drinking water. Absence of solid waste dumping ground creates health hazards. Absence of covered drain and sewerage system creates sanitation problem in the Paurashava. Those problems should be removed through the proper planning and design.

**Water Supply:** All households are using hand tubewells as main source of drinking water and cooking purposes. Only 4.0 buildings are using water reservoir to maintain their daily needs. About 88% of the residents are using river and pond water for washing and bathing purposes. In the Paurashava, about 7500 hand tubewells are available. From a study made by Department of Public Health Engineering (DPHE) in 2007, 77% of the total tubewells are contaminated by arsenic. Ground water level during dry and wet seasons are 16ft and 3.5 ft respectively. In the Paurashava, 3 deep tubewells/pump houses with 14 km water supply line is found. In total, 404 households are linked with water supply line.

Hand tubewell and ponds as water sources exists in most of the Wards of the Kalkini Paurashava. Ownership of hand tubewell mostly goes to neighbour's property (58%) and

own property (36%). This scenario is found in almost all the Wards. Some residents of Ward No. 1, 2, 4, 5 and 8 are enjoying water source from Paurashava supply. People of all the Wards in the Paurashava use pond (68%) as a secondary source of water.

**Electricity:** Rural Electrification Board (REB) at present is providing electricity facility within the Paurashava area. There is no electricity substation in the Paurashava. Electricity poles of different sizes exist in the planning area to carry power network and the total number is 841 and length is 23.7 km. They cover almost every Ward in the planning area. High voltage towers are distributed evenly and transformers are used to transform the high voltage to low voltage for distributing to the clients. High voltage line (33KV) passed beside the highway in Ward No. 1, 3 and 9. There are HT/LT transformer stations which step down high voltages into low voltages which reach various Mohallah and Community areas through this electric supply line.

**Telecommunication:** There is a telephone exchange having a capacity of 250 lines maintained by Bangladesh Telecommunication Company Limited (BTCL) in the Paurashava. At present, there are 202 land telephone users including mobile phone networks of GrameenPhone, Aktel, Citycell, Banglalink and Teletalk which cover the entire planning area.

**Gas supply:** Gas supply is not available in the Paurashava.

The projection of utility service depends on the population growth and need assessment of the Paurashava inhabitants. After completion of population projection it is found that, population of the planning area will be 53973 in the year 2021. Projection on utility services also depends on present condition of urban services and future demand of those services.

**Demand analysis:** Existing utility facilities of the Paurashava are not sufficient and established without following any standard. Therefore, Team Leaders of all packages and urban planners from Project Management Office (PMO) have worked out and prepared different standards for projection of future facilities as per the requirement of Paurashava. Following of those standards have considered for the future demand with ensuring the quality and quantity of utility facilities.

**Table 13.1: Standard of utility facilities and future need**

Facility	Standard	Existing Facility (acre)	Proposed facility, including Existing (acre) (2021)
Drainage	1 acre /20,000 population	0.98	0.37
Water supply	1 acre /20,000 population	14 km supply line	0.37
Gas	1 acre /20,000 population	0	0.37
Solid waste disposal site	4–10 acres/Upazila HQ	0	6.00
Waste transfer station	0.25 acre/transfer station	0	0.25
Electric sub-station	1 acre/20,000 population	0	0.37

Facility	Standard	Existing Facility (acre)	Proposed facility, including Existing (acre) (2021)
Telephone exchange	0.5 acre/20,000 population	0	0.19
Fuel Station	0.5 acre/20,000 population	0	0.19

### 13.3 Proposals for Addressing Urban Services and Implementation Strategies

For existing urban services, the Paurashava will need to establish a communication with each of the appropriate implementing agencies the following:

- Which of the existing services run, not currently in road corridors, could or should be relocated into road corridors to facilitate planned development bearing in mind the cost implications of doing this?
- The corridor reservations that should be applied to the service networks that cannot be moved.
- The means of establishing and maintaining these reservations, free from other development.

For future expansions of the networks (in case of sewerage, possibly a new network), the Paurashava will need to establish with the appropriate implementing agency what the future requirements are, so that reservations can be applied and maintained. The Paurashava will need as part of this process:

- Try to ensure that secondary, tertiary and where possible primary networks are located within existing or proposed road corridors to minimize the requirement for separate land reservations. In most cases, it is known that this can be achieved. The likely exception will be primary electricity networks. The scale of this will demand separate land reservations.
- Where this cannot be achieved, agree with the relevant agency about the size of the reservation required, its alignment and approximate time-scale of implementation.
- To adopt the agreed reservation and ensure that it is maintained. When development applications are received which impinge upon this reservation, the Paurashava should not permit the development within the reservation, but ensure that it will be made to setback to the limit of the reservation.

Types of urban services that will need to be considered within the Paurashava are indicated below:

**Water supply:** Location of **water treatment plant** may be on a large plot (on 0.37 acres of land) with good access, close to source of water. It should be located upstream of any polluting development. **Desalination plant** may be located on large plot close to the river, upstream from any polluting activities. **Water reservation tanks** may be constructed on medium size plot in key locations throughout the Paurashava, preferably in an elevated

positioning relation to the area it is intended to serve, so as to maintain / increase pressure.

All water is carried by underground pipes of various diameters. The closer they are to the original source of treated water, the larger the pipe and therefore, trench to accommodate it must be. These pipes should be contained within road reserves.

**Sewerage facilities:** Location of **sewerage treatment plant** may be on large plot (on 0.37 acres of land), preferably on outskirts of the Paurashava. Sewerage pumping station may be located on small plots throughout the Paurashava and a system should be introduced.

If a sewerage network were to be installed, the sewerage originating throughout the Paurashava would be carried by means of underground pipes and culverts. These should be accommodated within road reserves.

**Electricity:** **Electricity power station** may be located on a large plot out of Paurashava with good accessibility. About **132/33KV switching station** may be established on a large plot (on 0.37 acres of land) on the edge of the Paurashava with good accessibility. About **33/11KV switching stations** may be established on medium sized plots in a small number of key locations throughout the Paurashava. **Electricity sub-station** may be constructed on small plots throughout the Paurashava. These can be accommodated on the plots they serve (industries) or in road corridors.

**Map 13.1: Proposed Urban Services**



**Primary networks;** principally 132KV, pylon supported power lines from the existing power stations which will enter the Paurashava at purpose built switching stations. The switching stations will usually be located at the fringe of the Paurashava. **Secondary networks;** 33KV or 11KV pole mounted power lines, although in cases the 33KV lines can also be pylon mounted. The 33KV lines will originate at the above mentioned switching station and supply power around the Paurashava to smaller switching stations at key locations around the Paurashava where they will be down-sized to 11KV. These, in turn, will supply power to more localized electricity sub-stations. The pole mounted lines can be located within principle road corridors (primary and district distributors). Pylon mounted lines should be allocated their own reserve. **Tertiary networks;** at the localized sub-stations, the 11KV power will be down-sized for distribution to individual premises. Power leaving these sub-stations is usually carried by 415V pole mounted lines. These can be accommodated within road corridors.

**Telephone:** An additional **telephone exchange** is unnecessary for the Paurashava. If required, it will need a medium size plot (on 0.19 acres of land), unless it also has to accommodate a transmission / reception tower, in which case it will require a fairly large plot. Medium sized plot will be needed for **local exchange**, central to its catchment area. **Street exchange** may be located on small plot in road corridor.

Telephone exchange lines can be either overhead, pole mounted or underground using newer Optical Fiber Cables. Both of these are carried to localized exchanges and then onto small roadside exchanges. From these connections are carried on poles to individual premises. All networks can be accommodated within road reserves.

**Gas supply:** In the Paurashava, gas supply is not provisioned. If, in future (within 10 years), gas is being supplied by the government to the Paurashava, some necessary steps should be considered by the authority. They are, in case of **gas manifold station**, may be located on small to medium sized plot (on 0.37 acres of land) on the main ring, at the fringe of the Paurashava. **Upazila regulator station** may be located on small plots throughout the Paurashava. These will be located at the break-off point on the main line, where smaller diameter spurs extend into the area that the gas will serve.

When gas supply will be available in the Paurashava, all gas will be supplied by varying diameter underground pipes. These can be accommodated in road reserves.

### 13.4 Regulations to Address the Proposals

**Local Government (Paurashava) Act, 2009 (Act No. XLXVIII of 2009)** was enacted in 6<sup>th</sup> October 2009. According to the 2<sup>nd</sup> Schedule, Sl. No. 10, the Paurashava may provide supply of wholesome water sufficient for public and private purposes. Frame and execute



water supply scheme for the construction and maintenance of such works for storage and distribution of water. In case of private sources of water supply, it is said that, all private sources of water supply within the Paurashava shall be subject to control, regulation and inspection by the Paurashava. No new well, water pump or any other source of water for drinking purposes shall be dug, constructed or provided except with the sanction of the Paurashava.

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

The sewerage facilities may be provided by the Paurashava and Directorate of Public Health Engineering (DPHE). According to the 2<sup>nd</sup> Schedule, Sl. No. 12, of the Local Government (Paurashava) Act, 2009, Paurashava may provide an adequate system of public drains and all such drains shall be constructed, maintained, kept, cleared and emptied with due regard to the health and convenience of the public. All private drains shall be subject to control, regulation and inspection by the Paurashava.

**Public Health (Emergency Provisions) Act, 1944 (Act No. XXI of 1944)** was enacted in 20<sup>th</sup> 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 Act.

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 12<sup>th</sup> 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 Act, 1977) is performing the role relevant with the electrification of the Paurashava. The existing authorities will be needed for electrification of the Paurashava according to the guidelines presented in the plan.

**Telegraph and Telephone Board Act, 1975 (Act No. XLVII of 1975)** was enacted in 30<sup>th</sup> August 1975. A Telegraph and Telephone Board (T&T Board) was composed through this Act. Section 6(1) of the Act has prescribed the functions of the Board and said, it shall be the function of the Board to provide efficient telegraph and telephone services and to do

all acts and things necessary for the development of telegraphs and telephones. In the Paurashava, at present, a T & T Board is performing the functions prescribed in the section 6(1). T & T Board is the sole authority for performing the same and it will be continued in future also. But, the Mobile telephone system generates a revolution in the society. Most of the people are depended on the Mobile phone system. The plan does not consider this system.

### **13.5 Implementation, Monitoring and Evaluation of the Urban Services Plan**

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

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

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

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- would increase in land for development without large cash outlays by government to purchase land for development schemes; and
- would keep provision of land for community facilities virtually no cost to government.

### **Plan Monitoring**

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

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

## **Evaluation**

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

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

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



# CHAPTER 14

## 14. WARD ACTION PLAN

### 14.1 Introduction

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

#### 14.1.1 Background

There are several patches of land in the Paurashava area where planned development can be achieved through use of different land development techniques. One of those techniques is Land Readjustment Technique, may be practiced for the development of Ward as a Ward Action Plan. The plan prepared for designated areas in conforming to the land development techniques is known as Action Area Plan.

It is also expected that following successful implementation of the Ward Action Plan in one side, management would be more efficient in handling projects and in another people residing in unplanned areas would feel the benefit of such Action Plan ensuring more effective community participation.

#### 14.1.2 Content and Form of Ward Action Plan

The report has been divided in to five main parts. These are preceded by introductory chapters which explain the approach of the report and provide background with the linkage of Structure Plan and Urban Area Plan. Part two of the report identifies strategies and policies prescribed in the Structure Plan and Urban Area Plan and their uses for the preparation of Ward Action Plan. The chapter also covers prioritization in case of development needs and Ward-wise Action Plan for next five years. Ward-wise Action Plan is being presented in the next part of the report. Proposal, priority tasks and financial involvement with the infrastructural development as a priority basis are the outcome of this part. Implementation guidelines are the key issues of part four. Comparative Advantage of Master Plan and proposals for mitigation of identified issues are the components of last part of this report.

#### 14.1.3 Linkage with the Structure and Urban Area Plan

The Ward Action Plan for the Paurashava has been prepared on the basis of following principles relevant with the Structure Plan and Urban Area Plan:

- Environment friendly sustainable development of the area.
- Town functions to develop as per major landuse zones.

- Effective drainage system through minimum hindrance to Flood Flow zones.
- Safe residential areas at proximity to place of work or major communication routes.
- Smooth and effective functioning of industries, specially agro-based industries.
- Safe yet faster connectivity.
- Develop to serve the surrounding hinterlands.

#### **14.1.4 Approach and Methodology**

For the preparation of Ward Action Plan the planning area has been sub-divided into Nine Planning Zones according to the individual Ward. Immediate necessary action will be required for Ward Action Plan and this is the key outcome of Ward Action Plan. Where, what type of action will be required and how the action will be performed prescribed in the plan.

#### **Pro-people Urban Planning**

The Ward Action Planning approach utilizes in the Paurashava Master Plan concentrating mainly on the building of infrastructure and roads to facilitate the movements of vehicles. In this scenario, Paurashava society would become steadily more privatized with private homes, offices and commercial activities, while all-important public component of urban life is likely to slowly disappear.

The landuse and transport interaction for a modern city should be directed toward “Planning for people, not for vehicles, roads or buildings”. Given the problems of alienation, crime, fear of strangers and the breakdown of civic life, it is increasingly important to make cities inviting so that people can meet their fellow citizens face-to-face and experience human contact with those unknown to and different from them directly through their senses. Public life in high quality public spaces is an important part of a democratic society and full life.

#### **Evidence-based vs. Arbitrary Planning Approach**

In the era of globalization, where information on any number of issues and about any number of places is readily accessible, there is no need for localities to continue making the same mistakes as they did when operating in an information and experience vacuum. While urban planning is of course a complicated process, it is also true that some universals exist in terms of what works and what does not. The experiences of urban areas adopting commercial-based and people-based approaches make clear the effects of either method, and many guides are now available on implementing planning approaches that are good for the natural environment and for urban dwellers.

Given the widespread availability of such information, it is highly regrettable that important landuse and transport policy-decisions should adopt either any knowledge-

based or scientific analysis. Instead, arbitrary or so-called “common sense” approaches should not be utilized which may favour the rich, including bureaucrats and developers with little concern for the betterment of society overall.

Although, it is a demanding task to represent the complex dynamics of urban landuse changes that are consistent with observable data, significant progress has been made in recent years in the country in forecasting and evaluating landuse change on the basis of dynamic and causal relationships between such factors as transport and landuse, and built environment and socio-economic processes.

With the advance of the knowledge-base and technology-base, detailed and extensive urban form and function data is becoming increasingly available, with great potential to provide new insights for sustainable urban planning which preserves the eco-system and maintains or even increases social equity.

Yet no attempt was made in the preparation of Upazila Master Plan / Landuse Plan (in 1980s) to conduct any analytical or empirical analysis using data related to interactions between the built environment, transport, landuse and other socio-economic processes.

Again, in Paurashava Master Plan, the Geographic Information System (GIS)-based technology is mainly used for mapping and visual displays, which are limited to static displays of past and current data sets. That is, the displays only portray the current state of the system, with neither the reasons given for its condition nor possible alternate futures provided. As a result, policymakers and planners are now facing tremendous difficulties, lacking as they do any insight into future urban growth and the potential impacts of various models.

Hypothetical Planning Approach under Upazila Master Plan/Landuse Plan, no comprehensive data collection exercise was undertaken to estimate landuse requirements for the Paurashava. As a result, all the landuse proposals of that plan were hypothetical in nature, providing no insight into how the actual landuse demand for various purposes will meet in future.

Yet it is not logical to develop a Ward Action Plan, which represents the lowest tier of the planning hierarchy, without providing precise landuse allocations for different functional purposes.

Furthermore, in the Paurashava Plan, a significant portion of existing open space and agriculture land have been allocated for private developers required as per the 2031 population projection. This excess land for property developers is likely not only to create landuse speculation but also indiscipline in future landuse development. More



importantly, the preservation of land for open space and agriculture is vital for the health and viability of the Paurashava and its inhabitants.

## **14.2 Derivation of Ward Action Plan**

### **14.2.1 Revisit Structure Plan**

All the studies carried out at varying point of time converged to the same conclusion that the vital contribution of the Paurashava areas are bounded by Arialkha and Palardi River as main flood flow zone allowing excess flood water to pass over it during rainy season, must not be obstructed by any development. Despite this unanimous expert cautions, the area will experience a tremendous development pressure. The Consultant has tried to work out an effective strategy to address the later with acceptably low obstruction to the flood water to pass through. The strategies are as follows under some basic heads:

#### **Drainage**

- Non-continuous smaller rural settlements above flood level surrounded by ample low lying areas (agriculture, sub-flood flow, main flood flow, etc.) allowing uninterrupted flow of water to pass through.
- Minimize obstruction of flood water as is practicable.
- Appropriate connectivity by roads having sufficient openings to ensure needful flow of water across them as well as uninterrupted traditional water-based connectivity by keeping appropriate navigation clearance at the bridges. This would help to maintain the biodiversity of the area and contribute to sustainable environment in turn.

#### **Residential Development**

- Residential Landuse Zone is based on the potentiality, trend and opportunity.
- Adaptation of neighbourhood concept for new residential developments and for need assessment of community facilities.
- Prohibition of through traffic and heavy vehicles within the neighbourhoods.
- Provide adequate safe and easy to move footpaths.
- Ensure community facilities and services of appropriate scale at neighbourhood level.

#### **Industrial Development**

- Ensure provision of central effluent treatment plant in case of industrial clusters.
- Ensure own treatment plant in case of individual facilities.
- Prohibit high hazard industries within the residential area.
- Relocate industries from predominantly residential zones in phases.
- Provide essential support facilities for effective functioning of the industries.

### **Mixed-Use Development**

- Relocate noxious and heavy industries [red category as per DoE] to Heavy Industrial Area within as soon as practicable.
- Ensure adequate utility services to ensure uninterrupted production.
- Allow the red industries to maintain their status under strict abiding conditions until shifting.
- Ensure adequate safety and security of the people especially of the families residing in such mixed-areas.
- Provide sufficient quantity of wide, easy to use and safe footpaths.
- Provide Zebra Crossing at road crossings to ease the lives of major portion of low-income workers likely to traverse on foot to reach their likely abode in the busy area.

### **Transport and Communication**

- Provide safe, adequate and comfortable pedestrian ways.
- Provide appropriate and effective public transport routes with sufficient number of quality public transport to carry passenger.
- Grade separation of National and Regional Highways from the local roads, latter being at grade and other two above grades.

### **Flood Flow Zones**

- Strictly preserve the riverfront area as per the area demarcated by the Water Development Board.
- Promote agricultural and passive recreational use of the area during dry season.

### **Non-urban Areas**

- Promote traditional waterways (if any) in the low-lying areas by constructing submerged road for dry season connectivity.
- Strictly preserve agriculture land from conversion into non-agricultural use.
- Promote rural characteristics in the isolated homesteads keeping mandatory buffer to make way for the flood water intrusion.

### **Water body and Open Spaces**

- Strictly protect canal networks providing the missing links.
- Make provision for open spaces and water body at the neighbourhood level.
- Strictly protect the river fronts and open it for the dwellers as a passive recreation.
- Make town-scale open space with easy accessibility especially for people of densely populated areas with meager scope for open space.

### **Amenities and Community Facilities**

- Consider neighbourhood concept of residential development for estimating community facilities and amenities requirement.
- Prohibit construction of religious structure unless built on its own land.
- Relocate unauthorized religious structures from road Right of Way to safeguard greater interest of the people specially the Paurashava dwellers.
- Close/relocate existing schools with highly inadequate class rooms, play field and essential facilities and gradually replace with standard considered in the Urban Area Plan.
- Evacuate unauthorized structures and uses from road's Right of Way to safeguard greater interest of the people specially the Paurashava dwellers.

### **Solid Waste Management**

- No more conventional disposal through dumping.
- Solid Waste Processing to ensure recycling.
- Conversion of traditional solid waste in to fertilizer.
- Door to door collection instead of road side bin disposal.
- Disposal of hospital and other hazardous waste in the proposed disposal site.

### **Water Supply**

- Harness surface water source instead of ground water.
- Explore possibility of processing Palardi River water.
- Continuous monitoring of tube-well water to check arsenic contamination.
- Create scope of rain water harvesting.

### **Electricity**

- Priority for supplying electricity will be given to industry and irrigation pumps.
- Gradually coverage of the whole Paurashava with the increase of power generation.
- Gradually electricity network will be concealed through underground system.
- Explore the possibility of using renewable energy source in order to minimize cost of distribution network.
- Introduce solar energy in every establishment.

### **Environmental Management**

- Grouping of hazardous industries.
- Establishment of Common Effluent Treatment Plant.

- Adoption of neighbourhood concepts for new residential development.
- Generate waste water treatment plant.

### **Supporting the Surrounding Hinterland**

- Easy accessibility from the surrounding hinterlands especially growth centers.
- Ensure facilities such as cold storage, wholesale/retail market facilities for needful commodities (fertilizer, insecticide, agro-machineries, etc.) and shopping centers of regional standards to support population living in the surrounding hinterlands.

### **Conservation of Monument and Heritage**

- Identify and record all historical sites and monuments.
- Conserve and restore with standard procedure all historical sites and monuments.
- Evict illegal occupants of the historical sites.

### **Gas Supply**

- Explore possibility of use of gas in cylinder for domestic purposes.

#### **14.2.2 Prioritization**

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

#### **14.3 Ward-wise Action Plan for Next Five Years**

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

##### **14.3.1 Action Plan for Ward No. 01**

#### **Demography**

Ward No. 1 consists of the mouzas named Rajdi (part), Majidbari and Pangasia (part). It is situated on the south-central part of the Paurashava and Palardi River on the north and west, Ward No. 2 on the east and Ward No. 4 and 7 on the north. Ten local roads are in this Ward. This area is characterized by agriculture development. Development pressure is high along the local roads.

**Table 14.1: Population, area and density**

Type	Population 2011	Projected population			
		2016	2021	2026	2031
Population	6112	6356	6611	6875	7150
Area (acre)	984.04	984.04	984.04	984.04	984.04
Density/acre	6.21	6.46	6.72	6.99	7.27

Source: BBS 2011.

Present population of the Ward is 6112 (2011) and it will be 6356 in the year 2016, 6611 in 2021, 6875 in 2026 and 7150 in 2031. Density of population is 6 persons per acre and it will be increased up to 7 in 2031.

## Proposals and Plans for Ward No. 01

### Landuse Proposal

Ward No. 1 is important for vast agriculture land. Total planning area of the Ward is 984.00 acres. Among the total planning area, 443.8 acres land is under agriculture use, 256.3 acres residential, 17.8 acres commercial, 5.32 acres community services, 2.9 acres government service, 0.29 acres industrial development, mixed-use 10.5 acres and 13.9 acres for education and research.

**Table 14.2: Proposed Landuse**

Landuse Type	Acre	%
Agricultural Zone	443.79	45.10
Circulation Network	35.53	3.61
Commercial Zone	17.79	1.81
Community Facilities	5.32	0.54
Education & Research Zone	13.97	1.42
General Industrial Zone	0.29	0.03
Government Office	2.90	0.29
Health Services	1.46	0.15
Heavy Industrial Zone	0.00	0.00
Mixed Use Zone	10.51	1.07
Open Space	11.74	1.19
Recreational Facilities	0.38	0.04
Rural Settlement	67.98	6.91
Transport & Communication	1.49	0.15
Urban Deferred	11.26	1.14
Urban Residential Zone	256.32	26.05
Utility Services	0.00	0.00
Water Body	103.23	10.49
Total	984.00	100.00

In the proposal, health, open space and rural settlement are new adjustment. Mostly, agriculture land will be used for those purposes and those lands are under the jurisdiction of different uses. The plan considers rearrangement provision.

### Proposed Circulation Network

At present, 19.4 km. (13.4 acres) roads are in the Ward No. 1. Among total length, 9.7 km. road is pucca, 0.9 km. semi-pucca and 8.8 km katcha. In the plan, one 80 feet road,

one 40 feet road, thirteen 30 feet roads and seventeen 20 feet roads have been proposed. Total length of the proposed road is 15263 meter (15.2 km.).

**Table 14.3: Proposed road**

Road ID	Road type	Road width (f)	Length (m)	Phasing
D06	Tertiary	30	230.11	3rd Phasing
D07	Tertiary	20	152.24	3rd Phasing
D08	Tertiary	20	177.79	3rd Phasing
D09	Tertiary	20	1379.80	2nd Phasing
D10	Tertiary	30	577.32	3rd Phasing
D12	Primary	80	508.10	3rd Phasing
D15	Tertiary	30	82.45	3rd Phasing
D20	Tertiary	30	785.45	3rd Phasing
D21	Tertiary	20	747.59	3rd Phasing
D22	Tertiary	30	1492.68	1st Phasing
D27	Tertiary	30	509.54	3rd Phasing
D28	Tertiary	30	693.99	2nd Phasing
D38	Tertiary	30	91.37	3rd Phasing
D44	Tertiary	20	1651.53	1st Phasing
D45	Tertiary	20	67.12	2nd Phasing
D50	Tertiary	20	1404.00	3rd Phasing
D53	Tertiary	20	397.37	3rd Phasing
D54	Tertiary	20	172.09	1st Phasing
D55	Tertiary	30	250.81	1st Phasing
D59	Tertiary	20	122.56	3rd Phasing
D68	Tertiary	20	743.31	3rd Phasing
D69	Primary	60	2514.39	1st Phasing
D89	Tertiary	20	512.07	2nd Phasing
	Total		15263.67	

### Proposed Drain and Water Supply Line

At present, 2.33 km. pucca drain is in this Ward. One primary, fourteen tertiary and seventeen access drains have been proposed along the 80 feet, 40 feet, 30 feet and 20 feet width roads. Total length of those drains is 20 km. About 15 km. water supply line is being proposed for this Ward.

### Development Proposal

Though the Ward is undeveloped and it will take time to develop properly. So, one dumping site is being located outside the Porashava with 2.3 acres of land. One graveyard with 5.6 acres of land is being proposed on the plot no. 1738 and 1739 under the mouza named Lakhair Char of this Ward. Beside these a playground, a women college, a slaughter, a auto stand and a ward center has been proposed in this ward.

**Table 14.4: Development Proposal**

Proposed Facility	Ward Name	Mouza Name	Plot No	Phasing	Acres
Proposed Graveyard 02	Ward No. 01	Pangashia (079_02)	1011	1 <sup>st</sup> Phase	0.91
Proposed Auto Stand	Ward No. 01	Pangashia (079_01)	96	2 <sup>nd</sup> Phase	0.048
Proposed Slaughter House	Ward No. 01	Mazidbari (042_00)	93-95	2 <sup>nd</sup> Phase	0.371
Proposed Women College	Ward No. 01	Rajdi (078_02)	1013-15, 1017, 1018, 1020, 1021, 1077	3 <sup>rd</sup> Phase	2.451
Proposed Playground 01	Ward No. 01	Pangashia (079_01)	142-49	3 <sup>rd</sup> Phase	1.0
Proposed Eidgha	Ward No. 01	Pangashia (079_02)	1014-16	3 <sup>rd</sup> Phase	1.6
Proposed Ward Center 01	Ward No. 01	Rajdi (078_02)	1261	1 <sup>st</sup> Phase	0.55

**Map 14.1: Landuse Plan for Ward No 01**





**Map 14.2: Proposed Road and Drainage Plan for Ward No 01**



### 14.3.2 Action Plan for Ward No. 02

#### Demography

Ward No. 2 consists of five mouzas named Char Pangasia, Char Thengamara, Dakkhin Thengamara, Patabali (part) and Uttar Thengamara. It is situated on the south-western part of the Paurashava. Arikha River is on the north, south and eastern part and Ward No. 1 on the western part of the Ward. Four east-west and two north-south local roads serve the area. This area is characterized by agricultural development and government services. Development pressure is high on the northern part including along the roads.

**Table 14.5: Population, area and density**

Type	Population 2011	Projected population			
		2016	2021	2026	2031
Population	4843	5037	5238	5448	5665
Area (acre)	572.16	572.16	572.16	572.16	572.16
Density/acre	8.46	8.80	9.15	9.52	9.90

Source: BBS 2011.

Present population of the Ward is 4843 (2011) and it will be 5037 in the year 2016, 5238 in 2021, 5448 in 2026 and 5665 in 2031. Density of population is 8 persons per acre in the year 2011 and it will be 10 in the year 2031.

#### Proposals and Plans for Ward No. 02

##### Landuse Proposal

Ward No. 2 is important for agricultural farming. Total planning area of the Ward is 572.16 acres. Among the total area, agriculture use is 267.9 acres, commercial 6.5 acres, community service 4.6 acres, education and research 3.8 acres, government service 0.28 acres, industry 5.1 acres and residential 115.6 acres. Other use is negligible.

**Table 14.6: Proposed Landuse**

Landuse Type	Acre	%
Agricultural Zone	267.94	46.83
Circulation Network	21.10	3.69
Commercial Zone	6.53	1.14
Community Facilities	4.56	0.80
Education & Research Zone	3.85	0.67
General Industrial Zone	0.65	0.11
Government Office	0.28	0.05
Health Services	0.00	0.00
Heavy Industrial Zone	5.01	0.88
Mixed Use Zone	4.09	0.71
Open Space	22.04	3.85
Recreational Facilities	0.00	0.00
Rural Settlement	68.34	11.94
Transport & Communication	0.16	0.03
Urban Deferred	0.00	0.00
Urban Residential Zone	115.64	20.21
Utility Services	1.60	0.28
Water Body	50.34	8.80
Total	572.11	100

In the proposal, open space and rural settlement are new adjustment. Mostly, agriculture land will be used for those purposes and those lands are under the jurisdiction of different uses. The plan considers rearrangement provision.

### Proposed Circulation Network

At present, 12.4 km. (8 acres) roads are in the Ward No. 2. Among total length, 4.7 km. road is pucca, 0.9 km. semi-pucca and 6.8 km katcha. In the plan, two 60 feet roads, two 40 feet roads, five 30 feet roads and eleven 20 feet roads have been proposed. Total length of the proposed road is 8784.2 meter (8.7 km.).

**Table 14.7: Proposed road**

Road ID	Road type	Road Width (f)	Length (m)	Phasing
D11	Tertiary	20	779.89	3rd Phasing
D25	Tertiary	20	209.92	3rd Phasing
D43	Tertiary	30	3143.97	1st Phasing
D45	Tertiary	20	675.38	2nd Phasing
D46	Tertiary	20	1739.80	3rd Phasing
D63	Primary	60	470.87	1st Phasing
D68	Tertiary	20	118.09	3rd Phasing
D69	Primary	60	435.31	1st Phasing
D74	Primary	60	439.40	3rd Phasing
D80	Tertiary	30	257.91	2nd Phasing
D82	Secondary	40	435.64	3rd Phasing
D89	Tertiary	20	78.10	2nd Phasing
		Total	8784.27	

### Proposed Drain and Water Supply Line

At present, 1.20 km. pucca drain is in this Ward. Two secondary, seven tertiary and eleven access drains have been proposed along the 60 feet, 40 feet, 30 feet and 20 feet width roads. Total length of those drains is 50 km. About 45 km. water supply line is being proposed for this Ward.

### Development Proposal

A shoshan ghat, a cow market, a children park and a ward center is being proposed in this Ward. Existing services should be developed to make it useable.

**Table 14.8: Development Proposal**

Proposed Facility	Ward Name	Mouza Name	Plot No	Phasing	Acres
Proposed Shoshan Ghat 02	Ward No. 02	Char Pangshya (293_00)	409	2 <sup>nd</sup> Phase	2.5
Proposed Overhead Tank	Ward No. 02	Char Thangamara (292_01)	409, 1520-24, 1534	3 <sup>rd</sup> Phase	1.599
Proposed Cow Market	Ward No. 02	Char Thangamara (292_01)	409	2 <sup>nd</sup> Phase	1.384
Proposed Children Park	Ward No. 02	Char Pangshya (293_00)	409	1 <sup>st</sup> Phase	6.07
Proposed Ward Center 02	Ward No. 02	UttarThengamara (082_00)	205	3 <sup>rd</sup> Phase	0.56

**Map 14.3: Landuse Plan for Ward No 02**



**Map 14.4: Proposed Road and Drainage Plan for Ward No 02**





### 14.3.3 Action Plan for Ward No. 03

#### Demography

Ward No. 3 consists of three mouzas named Char Fatebahadur (part), Patabali (part) and Sikarmongol (part). The Ward is situated on the southeastern part of the Paurashava. Arialkhan River is on the north and west, Daulatkhan Upazila on the south and Shariatpur Zila on the eastern part of this Ward. Eight east-west and two north-south local roads serve the area. This area is characterized by fish farming, rural homestead and agriculture land. There are pockets of agriculture land in the Ward.

**Table 14.9: Population, area and density**

Type	Population 2011	Projected population			
		2016	2021	2026	2031
Population	5436	5653	5879	6114	6359
Area (acre)	1324.33	1324.33	1324.33	1324.33	1324.33
Density/acre	4.10	4.27	4.44	4.62	4.80

Present population of the Ward is 5436 (2011) and it will be 5653 in the year 2016, 5879 in 2021, 6114 in 2026 and 6359 in 2031. Density of population is 4 persons per acre and it will be 5 in 2031.

#### Proposals and Plans for Ward No. 03

##### Landuse Proposal

Ward No. 3 is important for agricultural and industrial development. Total area of the Ward is 1324.33 acres. Among the total area, agriculture use is 1050.82 acres, commercial 2.26 acres, community service 4.73 acres and residential 0.11 acres. Areas under education and research are 3.67 acres and industry 22.67 acres.

**Table 14.10: Proposed Landuse**

Landuse Type	Acre	%
Agricultural Zone	1024.82	77.39
Circulation Network	48.07	3.63
Commercial Zone	2.26	0.17
Community Facilities	4.73	0.36
Education & Research Zone	3.67	0.28
General Industrial Zone	22.67	1.71
Government Office	0.00	0.00
Health Services	0.00	0.00
Heavy Industrial Zone	0.00	0.00
Mixed Use Zone	0.00	0.00
Open Space	25.41	1.92
Recreational Facilities	0.00	0.00
Rural Settlement	110.77	8.36
Transport & Communication	0.00	0.00
Urban Deferred	0.00	0.00
Urban Residential Zone	0.11	0.01
Utility Services	0.00	0.00
Water Body	81.79	6.18
Total	1324.29	100.00

In the proposal, open space and rural settlement are new adjustment. Mostly, agriculture land will be used for those purposes and those lands are under the jurisdiction of different uses. The plan considers rearrangement provision.

### Proposed Circulation Network

At present, 15.7 km. (12 acres) roads are in the Ward No. 3. Among total length, 7.8 km. road is pucca, 0.3 km. semi-pucca and 7.6 km katcha. In the plan, two 80 feet width roads, two 60 feet width roads, three 30 feet width roads and four 20 feet width roads have been proposed. Total length of the proposed road is 11821.2 meter (11.8 km.).

**Table 14.11: Proposed road**

Road Id	Road type	Road Width (f)	Length (m)	Phasing
D03	Primary	80	1678.62	3rd Phasing
D43	Tertiary	30	23.58	1st Phasing
D60	Tertiary	20	526.77	3rd Phasing
D61	Tertiary	20	666.04	3rd Phasing
D62	Tertiary	20	497.92	3rd Phasing
D63	Primary	60	1193.74	1st Phasing
D64	Tertiary	30	1047.90	3rd Phasing
D67	Tertiary	20	326.12	3rd Phasing
D73	Primary	60	4842.39	1st Phasing
D75	Tertiary	30	22.12	2nd Phasing
D76	Secondary	40	996.05	2nd Phasing
		Total	11821.25	

### Proposed Drain and Water Supply Line

At present, 0.52 km. pucca drain is in this Ward. Two primary, two secondary, six tertiary and four access drains have been proposed along the 80 feet, 60 feet, 40 feet, 30 feet and 20 feet width roads. Total length of those drains is 35 km. About 30 km. water supply line is being proposed for this Ward.

### Development Proposal

An industrial area with 11.8 acres land (on plot no. 1197 and 1222), one park/shishupark with 6.3 acres land (on plot no. 1090 to 1093 and 1177 to 1180) and a stadium with 6.10 acres land (on plot no. 2207 to 2220) have been proposed in this Ward. All the services is being proposed in the mouza named Prabhakardi.

**Table 14.12: Development Proposal**

Proposed Facility	Ward Name	Mouza Name	Plot No	Phasing	Acres
Proposed Shoshan Ghat 01	Ward No. 03	Char Fathebahadurpur (424_05)	3725, 3728, 3729	2 <sup>nd</sup> Phase	0.170
Proposed Ward Center 03	Ward No. 03	Char Fathebahadurpur (424_04)	1638	3 <sup>rd</sup> Phase	0.77

**Map 14.5: Landuse Plan for Ward No 03**



**Map 14.6: Proposed Road and Drainage Plan for Ward No 03**



#### 14.3.4 Action Plan for Ward No. 04

##### Demography

Ward No. 4 consists of four mouzas named Char Bibhagdi, Char Jhautala, Char Krisnanagar and Lamchari (part). It is situated on the central part of the Paurashava. Ward No. 6 and 8 is on the north, Ward No. 1 on the south, Ward No. 5 including Arialkhan River on the east and Ward No. 7 on the western part of this Ward. Five east-west and two north-south local roads serve the area. This area is characterized by rural homesteads and agriculture land.

**Table 14.13: Population, area and density**

Type	Population 2011	Projected population			
		2016	2021	2026	2031
Population	2968	3087	3210	3339	3472
Area (acre)	485.07	485.07	485.07	485.07	485.07
Density/acre	6.12	6.36	6.62	6.88	7.16

Present population of the Ward is 2968 (2011) and it will be 3087 in the year 2016, 3210 in 2021, 3339 in 2026 and 3472 in 2031. Density of population is 6 persons per acre and it will be 7 in the year 2031.

##### Proposals and Plans for Ward No. 04

##### Land use Proposal

Ward No. 4 is important for agricultural farming and commercial activities. Total area of the Ward is 485.07 acres. Among the total area, agriculture use is 318.4 acres and residential 55.4 acres. Areas under commercial activities are 1.97 acres and education and research 10.77 acres. Other use area is negligible.

**Table 14.14: Proposed Land use**

Landuse Type	Acre	%
Agricultural Zone	318.40	65.64
Circulation Network	15.85	3.27
Commercial Zone	1.97	0.41
Community Facilities	0.78	0.16
Education & Research Zone	10.77	2.22
General Industrial Zone	0.01	0.00
Government Office	0.00	0.00
Health Services	0.00	0.00
Heavy Industrial Zone	14.19	2.93
Mixed Use Zone	0.00	0.00
Open Space	17.35	3.58
Recreational Facilities	0.00	0.00
Rural Settlement	12.89	2.66
Transport & Communication	0.00	0.00
Urban Deferred	0.00	0.00
Urban Residential Zone	55.04	11.35
Utility Services	0.00	0.00
Water Body	37.81	7.80
Total	485.07	100.00



In the proposal, open space and rural settlement are new adjustment. Mostly, agriculture land will be used for those purposes and those lands are under the jurisdiction of different uses. The plan considers rearrangement provision.

### Proposed Circulation Network

At present, 7.5 km. (4.3 acres) roads are in the Ward No. 4. Among total length, 5.2 km. road is pucca, 0.1 km. semi-pucca and 2.2 km katcha. In the plan, one 60 feet width road, one 40 feet width road, eight 30 feet width roads and seven 20 feet width roads have been proposed. Total length of the proposed road is 7418.5 meter (7.4 km.).

**Table 14.15: Proposed road**

Road Id	Road type	Road Width (f)	Length (m)	Phasing
D14	Tertiary	30	331.45	3rd Phasing
D23	Tertiary	20	509.02	3rd Phasing
D24	Tertiary	30	84.46	2nd Phasing
D25	Tertiary	20	49.49	3rd Phasing
D26	Tertiary	30	311.16	2nd Phasing
D51	Tertiary	30	1194.23	1st Phasing
D57	Tertiary	20	634.26	2nd Phasing
D63	Primary	60	130.10	1st Phasing
D74	Primary	60	876.07	3rd Phasing
D75	Tertiary	30	531.29	2nd Phasing
D79	Secondary	40	185.12	1st Phasing
D80	Tertiary	30	800.35	2nd Phasing
D82	Secondary	40	380.26	3rd Phasing
D85	Tertiary	20	414.01	3rd Phasing
D88	Tertiary	20	337.24	3rd Phasing
D90	Tertiary	20	650.05	1st Phasing
		Total	7418.56	

### Proposed Drain and Water Supply Line

At present, no drain is in this Ward. One secondary, ten tertiary and seven access drains have been proposed along the 60 feet, 40 feet, 30 feet and 20 feet width roads. Total length of those drains is 40 km. About 35 km. water supply line is being proposed for this Ward.

### Development Proposal

A university and a ward center has been proposed in this ward.

**Table 14.16: Development Proposal**

Proposed Facility	Ward Name	Mouza Name	Plot No	Phasing	Acres
Proposed University	Ward No. 04	Char Jhautala (087_00)	109-121,134-39	3 <sup>rd</sup> Phase	3.9
Proposed Ward Center 04	Ward No. 04	Char Jhautala (087_00)	97	1 <sup>st</sup> Phase	0.54

**Map 14.7: Landuse Plan for Ward No 04**



**Map 14.8: Proposed Road and Drainage Plan for Ward No 04**



### 14.3.5 Action Plan for Ward No. 05

#### Demography

Ward No. 5 consists of five mouzas named Bibhagdi, Darirchar Laxmipur (part), Lamchari (part), Char Sadipur and Uttar Krisnanagar. It is situated on the northeastern part of the Paurashava. Enayetnagar Upazila of Barisal is on the north, south and east, Arialkhan River on the western part of this Ward. One east-west and one north-south local roads serve the area. This area is characterized by fish farming, agriculture land and rural homesteads.

**Table 14.16: Population, area and density**

Type	Population 2011	Projected population			
		2016	2021	2026	2031
Population	4101	4265	4436	4613	4798
Area (acre)	1027.26	1027.26	1027.26	1027.26	1027.26
Density/acre	3.99	4.15	4.32	4.49	4.67

Present population of the Ward is 4101 (2011) and it will be 4265 in the year 2016, 4436 in 2021, 4613 in 2026 and 4798 in 2031. Density of population is 4 persons per acre and it will be 5 persons per acre in 2031.

#### Proposals and Plans for Ward No. 05

##### Land use Proposal

Ward No. 5 is important for agricultural farming. Total area of the Ward is 1027.26 acres. Among the total area, agriculture use is 862.00 acres and residential 16.8 acres. Areas under community facilities are 2.53 acres, commercial 37 acres and education and research 1.59 acres.

**Table 14.17: Proposed Landuse**

Landuse Type	Acre	%
Agricultural Zone	862.00	83.92
Circulation Network	18.29	1.78
Commercial Zone	0.37	0.04
Community Facilities	2.53	0.25
Education & Research Zone	1.59	0.15
General Industrial Zone	0.00	0.00
Government Office	0.00	0.00
Health Services	0.00	0.00
Heavy Industrial Zone	0.00	0.00
Mixed Use Zone	0.00	0.00
Open Space	1.12	0.11
Recreational Facilities	0.00	0.00
Rural Settlement	74.02	7.21
Transport & Communication	0.00	0.00
Urban Deferred	0.00	0.00
Urban Residential Zone	16.80	1.64
Utility Services	0.10	0.01
Water Body	50.40	4.91
Total	1027.23	100

In the proposal, open space and rural settlement are new adjustment. Mostly, agriculture land will be used for those purposes and those lands are under the jurisdiction of different uses. The plan considers rearrangement provision.

### Proposed Circulation Network

At present, 8.3 km. (5 acres) roads are in the Ward No. 5. Among total length, 4.4 km. road is pucca and 3.9 km katcha. In the plan, one 40 feet width road, seven 30 feet width roads and six 20 feet width roads have been proposed. Total length of the proposed road is 9266 meter (9.2km.).

**Table 14.18: Proposed road**

Road Id	Road type	Road Width (f)	Length (m)	Phasing
D24	Tertiary	30	744.31	2nd Phasing
D25	Tertiary	20	92.56	3rd Phasing
D33	Tertiary	20	310.44	3rd Phasing
D37	Tertiary	30	229.94	1st Phasing
D51	Tertiary	30	840.68	1st Phasing
D57	Tertiary	20	476.73	2nd Phasing
D74	Primary	60	328.22	3rd Phasing
D75	Tertiary	30	88.56	2nd Phasing
D76	Secondary	40	312.89	2nd Phasing
D77	Tertiary	20	1250.96	3rd Phasing
D78	Secondary	40	787.39	3rd Phasing
D79	Secondary	40	771.29	1st Phasing
D81	Tertiary	30	358.44	3rd Phasing
D82	Secondary	40	693.26	3rd Phasing
D90	Tertiary	20	1980.43	1st Phasing
		Total	9266.09	

### Proposed Drain and Water Supply Line

At present, no drain is in this Ward. Eight tertiary and six access drains have been proposed along the 40 feet, 30 feet and 20 feet width roads. Total length of those drains is 30 km. About 25 km. water supply line is being proposed for this Ward.

### Development Proposal

A ward center and a waste transfer center are being proposed in this Ward. Existing services should be developed to make it useable.

**Table 14.19: Development Proposal**

Proposed Facility	Ward Name	Mouza Name	Plot No	Phasing	Acres
Proposed Waste transfer Station 02	Ward No. 05	Char Krishnanagar (295_00)	607	3 <sup>rd</sup> Phase	0.094
Proposed Ward Center 05	Ward No. 05	Char Sadipur (304_00)	490-92	2 <sup>nd</sup> Phase	0.54

**Map 14.9: Landuse Plan for Ward No 05**



**Map 14.10: Proposed Road and Drainage Plan for Ward No 05**

### 14.3.6 Action Plan for Ward No. 06

#### Demography

Ward No. 6 consists of four mouzas named Char Kasimpur, Char Laxmipur, Kastagar and Laxmipur Pakhira. It is situated on the northeastern part of the Paurashava. Arialkhan River flows through the middle from north to south of this Ward. Ward No. 4 is on the south, Ward No. 5 on the east, Madaripur Sadar Upazila on the north and Ward No. 4 and 8 on the western part of this Ward. Four east-west and four north-south local roads serve the area. This area is characterized by agriculture development and rural homesteads.

**Table 14.20: Population, area and density**

Type	Population 2011	Projected population			
		2016	2021	2026	2031
Population	3938	4095	4259	4429	4606
Area (acre)	674.13	674.13	674.13	674.13	674.13
Density/acre	5.84	6.07	6.32	6.57	6.83

Present population of the Ward is 3938 (2011) and it will be 4095 in the year 2016, 4259 in 2021, 4429 in 2026 and 4606 in 2031. Density of population is 6 persons per acre and it will be 7 persons per acre in 2031.

#### Proposals and Plans for Ward No. 06

##### Land use Proposal

Ward No. 6 is important for vast agriculture areas. Total area of the Ward is 674.13 acres. Among the total area, agriculture use is 459.49 acres and rural settlement 113.05 acres. Area under commercial activities is 0.18 acres, community service 2.19 acres and education & research 7.71 acres. Other use is negligible.

**Table 14.21: Proposed Landuse**

Landuse Type	Acre	%
Agricultural Zone	459.49	68.17
Circulation Network	20.98	3.11
Commercial Zone	0.18	0.03
Community Facilities	2.19	0.33
Education & Research Zone	7.71	1.14
General Industrial Zone	0.23	0.03
Government Office	0.00	0.00
Health Services	0.11	0.02
Heavy Industrial Zone	0.00	0.00
Mixed Use Zone	6.48	0.96
Open Space	4.04	0.60
Recreational Facilities	0.00	0.00
Rural Settlement	113.05	16.77
Transport & Communication	0.00	0.00
Urban Deferred	0.00	0.00
Urban Residential Zone	0.00	0.00
Utility Services	0.00	0.00
Water Body	59.62	8.84
Total	674.13	100

In the proposal, health and rural settlement are new adjustment. Mostly, agriculture land will be used for those purposes and those lands are under the jurisdiction of different uses. The plan considers rearrangement provision.

### Proposed Circulation Network

At present, 9.8 km. (7.6 acres) roads are in the Ward No. 6. Among total length, 6.2 km. road is pucca and 3.6 km katcha. In the plan, seven 30 feet width roads and six 20 feet width roads have been proposed. Total length of the proposed road is 9633.9 meter (9.6 km.).

**Table 14.22: Proposed road**

Road Id	Road type	Road Width (f)	Length (m)	Phasing
D02	Tertiary	30	1126.60	3rd Phasing
D31	Tertiary	20	931.19	3rd Phasing
D32	Tertiary	20	134.61	3rd Phasing
D33	Tertiary	20	472.95	3rd Phasing
D35	Tertiary	20	682.89	3rd Phasing
D37	Tertiary	30	1880.62	1st Phasing
D40	Tertiary	20	140.04	3rd Phasing
D48	Tertiary	30	1180.53	3rd Phasing
D49	Tertiary	20	20.56	3rd Phasing
D78	Secondary	40	12.93	3rd Phasing
D79	Secondary	40	2959.06	1st Phasing
D90	Tertiary	20	91.94	1st Phasing
		Total	9633.93	

### Proposed Drain and Water Supply Line

At present, no drain is in this Ward. Seven tertiary and six access drains have been proposed along the 30 feet and 20 feet width roads. Total length of those drains is 30 km. About 25 km. water supply line is being proposed for this Ward.

### Development Proposal

A high school a ward center and a vocational training institute has been proposed. Existing services should be developed to make it useable.

**Table 14.23: Development Proposal**

Proposed Facility	Ward Name	Mouza Name	Plot No	Phasing	Acres
Proposed High School	Ward No. 06	Lakhimpur Pakhara (092_00)	542-45	3 <sup>rd</sup> Phase	1.18
Vocational Training Center	Ward No. 06	Lakhimpur Pakhara (092_00)	432-34,522-34	3 <sup>rd</sup> Phase	3.67
Proposed Ward Center 06	Ward No. 06	Lakhimpur Pakhara (092_00)	478	1 <sup>st</sup> Phase	0.69

**Map 14.11: Landuse Plan for Ward No 06**



**Map 14.12: Proposed Road and Drainage Plan for Ward No 06**



### 14.3.7 Action Plan for Ward No. 07

#### Demography

Ward No. 7 consists of two mouzas named Jhautala and Rajdi (part). It is situated on the middle-western part of the Paurashava. Ward No. 8 and 9 is on the north, Ward No. 1 on the south, Palardi River on the west and Ward No. 4 on the eastern part of this Ward. One east-west and seven north-south local roads serve the area. This area is characterized by agriculture land, rural homesteads and pockets of socio-cultural activities.

**Table 14.24: Population and area**

Type	Population 2011	Projected population			
		2016	2021	2026	2031
Population	4161	4328	4501	4681	4868
Area (acre)	469.34	469.34	469.34	469.34	469.34
Density/acre	8.87	9.22	9.59	9.97	10.37

Present population of the Ward is 4161 (2011) and it will be 4328 in the year 2016, 4501 in 2021, 4681 in 2026 and 4868 in 2031. Density of population is 9 persons per acre and it will be 10 in the year 2031.

#### Proposals and Plans for Ward No. 07

##### Land use Proposal

Ward No. 7 is important for all type of uses. Total area of the Ward is 469.34 acres. Among the total area, agriculture use is 167.3 acres, residential 161.04 acres, commercial 0.5 acres, community service 2.27 acres, education and research 1.29 acres, government service 10.94 acres and transport and communication 0.63 acres. Other use is negligible.

**Table 14.25: Proposed Land use**

Landuse Type	Acre	%
Agricultural Zone	167.30	35.65
Circulation Network	23.39	4.98
Commercial Zone	0.50	0.11
Community Facilities	2.75	0.59
Education & Research Zone	1.29	0.27
General Industrial Zone	0.01	0.00
Government Office	10.94	2.33
Health Services	7.55	1.61
Heavy Industrial Zone	0.00	0.00
Mixed Use Zone	0.16	0.03
Open Space	8.38	1.79
Recreational Facilities	0.50	0.11
Rural Settlement	20.54	4.38
Transport & Communication	0.63	0.13
Urban Deferred	26.10	5.56
Urban Residential Zone	161.04	34.31
Utility Services	0.00	0.00
Water Body	38.22	8.14
Total	469.34	100.00



In the proposal, government offices, health, open space, recreational facility and rural settlement are new adjustment. Mostly, agriculture land will be used for those purposes and those lands are under the jurisdiction of different uses. About 4 acres agriculture land is being devoted for those rearrangement provisions.

### Proposed Circulation Network

At present, 9.2 km. (6.7 acres) roads are in the Ward No. 7. Among total length, 4.6 km. road is pucca, 0.1 km. semi-pucca and 4.5 km katcha. In the plan, one 40 feet width road, twelve 30 feet width roads and nine 20 feet width roads have been proposed. Total length of the proposed road is 11419.5 meter (43.46 km.).

**Table 14.26: Proposed road**

Road Id	Road type	Road Width (f)	Length (m)	Phasing
D13	Tertiary	30	991.86	3rd Phasing
D14	Tertiary	30	233.78	3rd Phasing
D15	Tertiary	30	241.73	3rd Phasing
D16	Tertiary	30	402.96	3rd Phasing
D17	Tertiary	20	209.01	3rd Phasing
D18	Tertiary	20	149.64	3rd Phasing
D19	Tertiary	20	1193.04	3rd Phasing
D23	Tertiary	20	10.11	3rd Phasing
D26	Tertiary	30	845.04	2nd Phasing
D29	Tertiary	20	547.12	3rd Phasing
D30	Tertiary	30	1511.28	3rd Phasing
D52	Tertiary	30	629.54	3rd Phasing
D55	Tertiary	30	33.91	1st Phasing
D56	Tertiary	20	454.25	3rd Phasing
D59	Tertiary	20	371.63	3rd Phasing
D69	Primary	60	950.86	1st Phasing
D70	Tertiary	20	452.09	3rd Phasing
D71	Tertiary	20	1054.72	2nd Phasing
D85	Tertiary	20	31.55	3rd Phasing
D86	Tertiary	20	513.35	1st Phasing
D87	Tertiary	20	303.31	3rd Phasing
D88	Tertiary	20	288.81	3rd Phasing
		Total	11419.57	

### Proposed Drain and Water Supply Line

At present, 1.30 km. pucca drain is in this Ward. Thirteen tertiary and nine access drains have been proposed along the 40 feet, 30 feet and 20 feet width roads. Total length of those drains is 40 km. About 35 km. water supply line is being proposed for this Ward.

### Development Proposal

A park and a ward center are being proposed in this Ward. Existing services should be developed to make it useable.

**Table 14.27: Development Proposal**

Proposed Facility	Ward Name	Mouza Name	Plot No	Phasing	Acres
Proposed Park 01	Ward No. 07	Jhautala (086_00)	192-204	1 <sup>st</sup> Phase	7.88
Proposed Ward Center 07	Ward No. 07	Rajdi (078_01)	620	3 <sup>rd</sup> Phase	0.74

**Map 14.13: Landuse Plan for Ward No 07**



**Map 14.14: Proposed Road and Drainage Plan for Ward No 07**



### 14.3.8 Action Plan for Ward No. 08

#### Demography

Ward No. 8 consists of the mouzas named Badardi, Dakkhin Janardandi (part), Kasimpur, Purba Minajdi, Ramnagar and Uttar Janardandi. It is situated on the north-western part of the Paurashava. Ward No. 6 is on the east, Ward No. 7 and 9 on the south, Ward No. 9 on the west and Madaripur Sadar Upazila on the northern part of this Ward. Four east-west and seven north-south local road serves the area. This area is characterized by rural homesteads and agricultural development.

**Table 14.28: Population, area and density**

Type	Population 2011	Projected population			
		2016	2021	2026	2031
Population	5234	5444	5662	5888	6124
Area (acre)	1134	1134	1134	1134	1134
Density/acre	4.62	4.80	4.99	5.19	5.40

Present population of the Ward is 5234 (2011) and it will be 5444 in the year 2016, 5662 in 2021, 5888 in 2026 and 6124 in 2031. Density of population is 5 persons per acre and it will remain up to the year 2031.

#### Proposals and Plans for Ward No. 08

##### Land use Proposal

Total area of the Ward is 1134.00 acres. Among the total area, agriculture use is 855.26 acres, rural settlement 154.3 acres, commercial activities 0.29 acres, community service 12.97 acres, education and research 3.74 acres and open space 14.11 acres. Other use is negligible.

**Table 14.29: Proposed Land use**

Landuse Type	Acre	%
Agricultural Zone	855.26	75.42
Circulation Network	22.94	2.02
Commercial Zone	0.29	0.03
Community Facilities	12.97	1.14
Education & Research Zone	3.74	0.33
General Industrial Zone	0.10	0.01
Government Office	0.00	0.00
Health Services	0.00	0.00
Heavy Industrial Zone	0.00	0.00
Mixed Use Zone	0.00	0.00
Open Space	14.11	1.24
Recreational Facilities	0.00	0.00
Rural Settlement	154.33	13.61
Transport & Communication	0.00	0.00
Urban Deferred	0.00	0.00
Urban Residential Zone	0.00	0.00
Utility Services	13.33	1.18
Water Body	56.90	5.02
Total	1134	100.00

In the proposal, educational facility, open space and rural settlement are new adjustment. Mostly, agriculture land will be used for those purposes and those lands are under the jurisdiction of different uses. The plan considers rearrangement provision.

### Proposed Circulation Network

At present, 11.2 km. (6.2 acres) roads are in the Ward No. 8. Among total length, 2.8 km. road is pucca and 8.4 km katcha. In the plan, eight 30 feet width roads and seven 20 feet width roads have been proposed. Total length of the proposed road is 11005 meter (11.0 km.).

**Table 14.30: Proposed road**

Road Id	Road type	Road Width (f)	Length (m)	Phasing
D01	Tertiary	20	526.32	3rd Phasing
D26	Tertiary	30	11.40	2nd Phasing
D34	Tertiary	30	887.96	2nd Phasing
D35	Tertiary	20	60.95	3rd Phasing
D36	Tertiary	20	444.25	3rd Phasing
D37	Tertiary	30	1205.85	1st Phasing
D47	Tertiary	30	1638.83	2nd Phasing
D49	Tertiary	20	885.56	3rd Phasing
D55	Tertiary	30	1873.54	1st Phasing
D65	Tertiary	20	1308.74	3rd Phasing
D66	Tertiary	20	242.76	3rd Phasing
D72	Tertiary	20	348.22	3rd Phasing
D83	Tertiary	30	284.64	3rd Phasing
D84	Tertiary	30	1286.15	1st Phasing
		Total	11005.18	

### Proposed Drain and Water Supply Line

At present, no drain is in this Ward. Eight tertiary and seven access drains have been proposed along the 30 feet and 20 feet width roads. Total length of those drains is 32 km. About 28 km. water supply line is being proposed for this Ward.

### Development Proposal

A park, a graveyard, a stadium and a ward center have been proposed in this Ward. Existing services should be developed to make it useable.

**Table 14.31: Development Proposal**

Proposed Facility	Ward Name	Mouza Name	Plot No	Phasing	Acres
Proposed Graveyard 01	Ward No. 08	Uttar Janardandi (070_00)	75-78, 81-84	1 <sup>st</sup> Phase	4.088
Proposed Stadium	Ward No. 08	Dakshin Janardandi (067_01)	23-26, 28, 29, 32, 33, 36-43, 45, 46, 91-100	3 <sup>rd</sup> Phase	7.252
Proposed Park 02	Ward No. 08	Uttar Janardandi (070_00)	27-50	1 <sup>st</sup> Phase	9.649
Proposed Ward Center 08	Ward No. 08	Dakshin Janardandi (067_01)	381	1 <sup>st</sup> Phase	0.36

**Map 14.15: Landuse Plan for Ward No 08**





**Map 14.16: Proposed Road and Drainage Plan for Ward No 08**



### 14.3.9 Action Plan for Ward No. 09

#### Demography

Ward No. 9 consists of four mouzas named Paschim Minajdi, Puali Madaripur, Dakkhin Gopalpur and Gopalpur (part). It is situated on the western part of the Paurashava. Ward No. 8 is on the north, Ward No. 7 on the east, Palardi River on the south and Gopalpur Upazila on the western part of this Ward. The Palardi River and National Highway is flowing through the middle from north to south of this Ward. Five east-west and six north-south local roads serve the area. This area is characterized by commercial development and agricultural practices.

**Table 14.32: Population, area and density**

Type	Population 2011	Projected population			
		2016	2021	2026	2031
Population	4400	4576	4759	4949	5147
Area (acre)	802.88	802.88	802.88	802.88	802.88
Density/acre	5.48	5.70	5.92	6.16	6.41

Present population of the Ward is 4400 (2011) and it will be 4576 in the year 2016, 4759 in 2021, 4949 in 2026 and 5147 in 2031. Density of population is 5 persons per acre and it will be 6 in the year 2031.

#### Proposals and Plans for Ward No. 09

##### Land use Proposal

Total area of the Ward is 802.88 acres. Among the total area, agriculture use is 362.9 acres, residential 202.68 acres, commercial 2.10 acres, industry 40 acres, community facilities 3.89 acres, education and research 10.62 acres, government office 6.27 acres and transportation and communication 2.21 acres. Other use is negligible.

**Table 14.33: Proposed Landuse**

Landuse Type	Acre	%
Agricultural Zone	362.92	45.20
Circulation Network	32.71	4.07
Commercial Zone	2.10	0.26
Community Facilities	3.89	0.48
Education & Research Zone	10.62	1.32
General Industrial Zone	19.31	2.41
Government Office	6.27	0.78
Health Services	0.07	0.01
Heavy Industrial Zone	20.58	2.56
Mixed Use Zone	0.00	0.00
Open Space	4.52	0.56
Recreational Facilities	0.00	0.00
Rural Settlement	21.93	2.73
Transport & Communication	2.21	0.27
Urban Deferred	22.63	2.82
Urban Residential Zone	202.68	25.25
Utility Services	2.93	0.37
Water Body	87.46	10.89
Total	802.88	100.00

In the proposal, health, open space, recreational facility and rural settlement are new adjustment. Mostly, agriculture land will be used for those purposes and those lands are under the jurisdiction of different uses. The plan considers rearrangement provision.

### Proposed Circulation Network

At present, 14.8 km. (10.80 acres) roads are in the Ward No. 9. Among total length, 8.4 km. road is pucca, 1.2 km. semi-pucca and 5.2 km katcha. In the plan, one 80 feet width road, five 30 feet width roads and ten 20 feet width roads have been proposed. Total length of the proposed road is 12213.31 meter (12.2 km.).

**Table 14.34: Proposed road**

Road Id	Road type	Road Width (f)	Length (m)	Phasing
D04	Tertiary	30	1076.92	3rd Phasing
D05	Tertiary	20	207.99	3rd Phasing
D12	Primary	80	1868.34	3rd Phasing
D38	Tertiary	30	1138.36	3rd Phasing
D39	Tertiary	20	640.03	3rd Phasing
D41	Tertiary	30	1722.01	2nd Phasing
D42	Tertiary	20	325.11	3rd Phasing
D47	Tertiary	30	1144.46	2nd Phasing
D54	Tertiary	20	1275.21	1st Phasing
D55	Tertiary	30	1026.24	1st Phasing
D56	Tertiary	20	12.47	3rd Phasing
D58	Tertiary	20	1403.18	1st Phasing
D72	Tertiary	20	330.48	3rd Phasing
D54	Tertiary	20	42.53	1st Phasing
		Total	12213.31	

### Proposed Drain and Water Supply Line

At present, no drain is in this Ward. One primary, five tertiary and ten access drains have been proposed along the 80 feet, 30 feet and 20 feet width roads. Total length of those drains is 35 km. About 30 km. water supply line is being proposed for this Ward.

### Development Proposal

A dumping site, a bus terminal, a truck terminal, a playground, a college, a waste transfer station and a ward center has been proposed in this Ward. Existing services should be developed to make it useable.

**Table 14.35: Development Proposal**

Proposed Facility	Ward Name	Mouza Name	Plot No	Phasing	Acres
Proposed Dumping Ground	Ward No. 09	Puali Madaripur (043_00)	23-25, 27-37	1 <sup>st</sup> Phase	3.067
Proposed Bus Terminal	Ward No. 09	Dakshin Gopalpur (044_00)	394, 395, 389	2 <sup>nd</sup> Phase	1.22
Proposed Truck Terminal	Ward No. 09	Gopalpur (045_00)	193,196-97	2 <sup>nd</sup> Phase	2.08
Proposed College	Ward No. 09	Paschim Minajdi (066_02)	530-36	3 <sup>rd</sup> Phase	6.12
Proposed Playground 02	Ward No. 09	Puali Madaripur (043_00)	154-160	3 <sup>rd</sup> Phase	0.96
Proposed Waste transfer Station 01	Ward No. 09	Paschim Minajdi (066_02)	543	3 <sup>rd</sup> Phase	0.33
Proposed Ward Center 09	Ward No. 09	Gopalpur (045_00)	176	2 <sup>nd</sup> Phase	0.62

**Map 14.17: Landuse Plan for Ward No 09**



**Map 14.18: Proposed Road and Drainage Plan for Ward No 09**





#### 14.4 Implementation Guidelines

Implementation of the Ward Action Plan should follow the development control procedures for determining planning applications by using simple and standard planning application procedures. A simple application will be assessed quickly against a given set of criteria, essentially consisting of the following:

1. The proposed development confirms all respects mentioned in the policies of the Structure Plan and Urban Area Plan.
2. The usage identified in the application is being considered appropriate for inclusion in an area demarcated in the Ward Action Plan. An indicative list of uses considered appropriate is below:
  - buildings are a maximum of four-storied;
  - no single building or related group of buildings is 1000 sq. m. of gross floor area; and
  - access and utility corridors are not impinged.

Provided that the planning application meets above criteria and the application will be approved and planning permission is given.

Planning applications that do not meet the above criteria or are considered marginal cases (to be known as an invalid simple application) will be subjected to a more detailed examination in considering standard procedure.

Following development and landuses are indicative of those appropriate in the Ward Action Plan:

1. Residential development up to four-storied.
2. Small-scale shops.
3. Primary schools / kindergartens.
4. Mosques (or other religious facilities) servicing a local area plus small graveyard if required.
5. Recreational development.
6. Local health facilities (clinics rather than hospital).
7. Small-scale office (may be public or private) development.
8. Workshops (small-scale workshops with operations only) in daylight hours and low traffic generators.
9. Open space (playgrounds, parks, etc.)
10. Access roads.
11. Utilities; and
12. Drainage channels.

When considering a standard planning application within areas zoned for Ward Action Plan, the Paurashava will need to undertake a two-stage process. **First**, before considering site specific issues, the Paurashava will need, on receipt of the planning

application, to consider the wider context and determine issues relating to the overall area into which the application falls. The Paurashava will need to:

1. Determine the boundaries of the wider area. These will usually be formed by some distinctive natural or man-made feature, for example a khal, river or road which provides access into the area. Such areas will vary in shape and size.
2. Identify and assess the existing access and circulation arrangements of the area. Preferably, the area should be served by 10 meter access roads which run through the entire area providing access to all Wards. These access roads should be linked to local roads. If this is not the case and access roads of sufficient width, are not available, the Paurashava shall consider whether or not further development is appropriate. New development may result in increased vehicular congestion and increased demand for utility services, where this could be difficult to supply.
3. Identify the existing landuses within these boundaries. In Ward Action Plan, the predominant use will be residential but other uses will present in the vicinity of the application.

In these instances, the Paurashava will consider refusal of application or at least a delay until access and utility provision can be made. This may require acquisition of land.

4. Identify the need for community facilities (schools, clinics, religious facilities, open spaces, etc.) or plots for utility services. Do sufficient already exist or should more land be sought for increased provision to the existing population? In this latter instance, the Paurashava will again need to consider acquisition of land including the land, either in part or in full, under consideration for development.
5. Consider areas of high landscape quality in the locality which should be preserved and the potential impact of the proposed development on those areas.

If there is doubt in the mind of the Paurashava as to the answers to the above questions, the planning application will require a more detailed assessment.

**Secondly**, the Paurashava will need to consider issues relating to the individual site and application. These can only be determined once the overall context of the area has been established. The questions the Paurashava will need to ask are:

1. Can be proposed use of land be considered a “good neighbour”, defined in this situation as a use which can be carried out in any residential area without detriment to the amenities of the area by reason of noise, vibration, smell, fumes, smoke, soot, ash, dust or grit?
  - Is the use likely to generate excessive volumes of traffic which either cannot be accommodated on the existing road system or which are likely to disturb, its neighbours?
  - Will the working hours of the use (if non-residential) cause a disturbance to residential neighbours (with working late in to the evening or night or 24-hours operations likely to cause a nuisance and therefore not being permitted)?
  - If yes to any of the above, the application should be rejected and directed to a more suitable location.

2. Is the use in conformity with the surrounding uses or with those that are compatible with a site in a predominantly residential area?
3. Does the proposed boundary of the application impinge upon a road corridor, utility reserve or drainage channel reserve? If it does, it should be relocated outside such a reserve, even if this constitutes a reduction in the overall size of the plot. If excessive land will be lost as a result, implying that the development can no longer proceed, the application will need to be rejected.
4. Does the application provide for adequate site access from, preferably as minimum, a 6 meter access road? Does it have sufficient on-site or off-site parking facilities to cater for the potential demand? If it does not, the plans should be amended or the application refused.
5. Will the development destroy landscape unique to the location? If it does, its design will need to be altered to protect the landscape, or the application will need to be refused.
6. Is the scale of development proposed in keeping with its neighbours? If too large, it should be reduced. Does it impinge up on the privacy of others? If it does, the design / layout / size should be changed. If it can not be appropriately modified, it should be refused.
7. Will the proposed development negatively impact upon utility provision in the area i.e. will it overload the system for some reason (like high electricity demand or high water consumption)? Will pollution from the proposed activities cause a problem in the neighbourhood? If this is likely to occur, the application should be refused.

If the application is for a major development, have the utility authorities being contacted to give their assessment and approval for the infrastructure works that will be required?

Given the existing situation in some of the Ward Action Plan, where for example, access is already poor or there is insufficient space available to provide adequate infrastructure, the Paurashava will aim to ensure that its decision will not make the situation worse.

The Paurashava will need to process each application within one month, at the end of which time they will either need to:

- approve the application unconditionally;
- approve the application subject to a number of conditions; or
- refuse the application.

## **14.5 Concluding Remarks**

### **14.5.1 Introduction**

The Master Plan is prepared for managing and promoting development over medium terms following the broad guidelines set by the longer term Structure Plan. It shows the structure of sub-system in space over the medium term and identifies broad programs of direct action especially related to infrastructural development, institutional issues as well as broad financing strategies. The plan also outlines more specific Ward-wise

development policies to guide development over the medium terms. One major objective of preparing Master Plan is the consolidation of development activities by various agencies in areas that have strongest potential for growth in the medium term and can accommodate anticipated volume of growth. Other purpose of preparing Master Plan is to facilitate the development control function. It shows the broad landuse zones on a more detailed scale of maps as derived from Structure Plan. The plan provides details of landuse zoning and building controls, the development control function becomes easier to implement with a Master Plan. It also shows land reservations required for essential uses and major infrastructure development.

#### **14.5.2 Comparative Advantage of Master Plan**

Comparative advantages of Master Plan rather than Ward Action Plan are:

- The term Master Plan deserves wider sense than the term Ward Action Plan. Policies and strategies are being prescribed in the Master Plan based on the existing trend of development and growth potentiality. The Ward Action Plan only emphasizes on those components immediate action is being necessary.
- The Master Plan is for the Paurashava as a whole but the Ward Action Plan is only for individual Ward. All studies relevant and guided by the ToR is being followed for the preparation of Master Plan at first and based on those studies and findings the Ward Action Plan is being designed.
- The Ward Action Plan is mostly relevant with the implementation criteria; it is called the implementation of Master Plan. The micro-component which is going to be implemented according to the Ward Action Plan is guided by the Master Plan. Therefore, any problem arises during the implementation phase of Ward Action Plan will be resolved through the guideline prescribed in the Master Plan.

#### **14.5.3 Addressing Proposals for Mitigation of Identified Issues**

- For improvement, construction and re-construction of local roads, bridge and culvert and box culvert, a close coordination among the authorities named Paurashava, LGED, PDB, REB and WDB will be maintained. This coordination is necessary from the preparation of budget to implementation of the component.
- In plan implementation phase, people's participation will be encouraged. The process as prescribed in the Structure Plan will be initiated for this purpose.
- A buffer will be needed for every important development especially for housing area, stadium and Bus terminal.

In preparing the proposed construction program priorities have been assigned to the works mostly in the various drainage areas taking the following factors into account:

- the severity of flooding in terms of depth, duration and frequency;

- the views of Paurashava officials on the relative needs of different areas;
- The engineering relationship of the proposed phase of construction to the preceding and subsequent phases;
- the estimated time required to execute the proposed works having regard to the capacity and capability of contractors and the availability of materials;
- the estimated amount of the capital investment required.

In general, aim should be to implement the Master Plan at a continuous steady rate throughout the 20 years period and based upon the above considerations, the works have been grouped broadly into four main stages:

- The first stage accords priority to improve the Traffic Management and alleviation of flooding in the central area of the Paurashava.
- The second stage in general covers less densely developed areas with the improvement of transport services.
- The third stage covers drainage congestion areas for improvement.
- The fourth stage will be the rain water harvesting for supplying drinking water to the Paurashava dwellers when scarcity will be generated.

#### **14.5.4 Conclusion**

To ensure that the procedures are being followed, the Paurashava will need to monitor the situation. This monitoring is required to ensure that:

- no illegal development is taking place i.e. no-one is attempting to develop without submitting an application; and
- approved developments are built in accordance with the approved plans.
- development will take places according to the Master Plan.



## **ANNEXURE A: Paurashava Gazette**



## ANNEXURE B: Permitted Landuse List

### a. Urban Residential Land Use

#### Land Use Permitted

The following uses in the tables are proposed to be applicable for this zone only.

**Table B.1: Land Use Permitted**

<b>Permitted Urban Residential Uses</b>
Artisan's Shop
Assisted Living or Elderly Home
Confectionery Shop
Barber Shop
Child Daycare \ Preschool
Cleaning \ Laundry Shop
Communication Service Facilities
Communication Tower Within Permitted Height
Condominium or Apartment
Cottage
Cyber Café
Daycare Center (Commercial or Nonprofit)
Drug Store or Pharmacy
Employee Housing (Guards \ Drivers) \ Ancillary Use
General Store
Grocery Store
High School
Household Appliance and Furniture Repair Service (No Outside Storage)
Housing For Seasonal Firm Labor
Landscape and Horticultural Services
Mosque, Place Of Worship
Newspaper Stand
Nursery School
Orphanage
Eidgah
Photocopying and Duplicating Services (No Outside Storage)
Pipelines and Utility Lines
Playing Field
Primary School
Private Garages (Ancillary Use)
Project Identification Signs
Property Management Signs
Public Transport Facility
Satellite Dish Antenna
Shelter (Passers By)
Shoe Repair or Shoeshine Shop (Small)
CBO Office
Special Dwelling
Temporary Tent
Temporary tent for Permitted Function

<b>Permitted Urban Residential Uses</b>
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)
<b>Neighborhood Center*</b> (Where Neighborhood Center exists)
<b>Permitted</b>
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 B.2: Land Use Conditionally Permitted**

<b>Conditionally Permitted Urban Residential Uses</b>
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

<b>Conditionally Permitted Urban Residential Uses</b>
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
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 B.3: Land Use Permitted**

<b>Permitted General Industrial Activities</b>
Confectionery Shop
Bank & Financial Institution
Bicycle Assembly, Parts and Accessories
Blacksmith
Bus Passenger Shelter
Communication Tower Within Permitted Height
Freight Transport Facility
Police Box \ Barrack
Fire \ Rescue Station
Grocery Store
Household Appliance and Furniture Repair Service
Machine Sheds
Meat and Poultry (Packing & Processing)
Mosque, Place Of Worship
Newspaper Stand
Photocopying and Duplicating Services
Pipelines and Utility Lines
Printing, Publishing and Distributing
Public Transport Facility
Restaurant
Retail Shops \ Facilities
Salvage Processing
Salvage Yards
Satellite Dish Antenna
Sawmill, Chipping and Pallet Mill
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 B.4: Land Use Conditionally Permitted**

<b>Conditionally Permitted General Industrial Land Uses</b>
Amusement and Recreation (Indoors)
Appliance Store
Plantation (Except Narcotic Plant)
Cyber Café

<b>Conditionally Permitted General Industrial Land Uses</b>
Daycare Center (Commercial or Nonprofit)
Doctor \ Dentist Chamber
Electrical and Electronic Equipment and Instruments Sales
Employee Housing
Energy Installation
Fast Food Establishment \ Food Kiosk
Garages
Grain & Feed Mills
Incineration Facility
Super Store
Lithographic or Print Shop
Motor Vehicle Fuelling Station \ Gas Station
Motorcycle Sales Outlet
Outdoor Fruit and Vegetable Markets
Outside Bulk Storage
Overhead Water Storage Tanks
Painting and Wallpaper Sales
Paints and Varnishes
Parking Lot
Parking Lot (Commercial)
Private Garages
Retail Shops Ancillary To Studio \ Workshop
Jute Mill

Source: Compiled by the Consultants

### **Restricted Uses**

All other uses; except the permitted and conditionally permitted uses.

### **c. Commercial Zone**

#### **Land Use Permitted**

Commercial zone is mainly intended for supporting the office and business works. There are several functions that are permitted in this zone.

**Table B.5: Land Use Permitted**

<b>Permitted Commercial Activity</b>
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

<b>Permitted Commercial Activity</b>
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)
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

<b>Permitted Commercial Activity</b>
Photofinishing Laboratory & Studio
Pipelines and Utility Lines
Post Office
Preserved Fruits and Vegetables Facility \ Cold Storage
Printing, Publishing and Distributing
Project Identification Signs
Property Management Signs
Public Transport Facility
Refrigerator or Large Appliance Repair
Resort
Restaurant
Retail Shops \ Facilities
Salvage Processing
Salvage Yards
Satellite Dish Antenna
Sawmill, Chipping and Pallet Mill
Shelter (Passers By)
Shopping Mall \ Plaza
Slaughter House
Software Development
Sporting Goods and Toys Sales
Taxi Stand
Telephone Exchanges
Television, Radio or Electronics Repair (No Outside Storage)
Theater (Indoor)
Transmission Lines
Utility Lines
Vehicle Sales & Service, Leasing or Rental
Veterinarian Clinics, Animal Hospitals, Kennels and Boarding Facilities
Warehousing
Wood Products
Woodlot
ATM Booth
Water Pump \ Reservoir
Agro-Based Industry (Rice Mill, Saw Mill, Cold Storage)
Social Forestry

Source: Compiled by the Consultants

### **Land Use Conditionally Permitted**

Some functions are permitted with some condition in this zone.

**Table B.6: Land Use Conditionally Permitted**

<b>Conditionally permitted commercial activities</b>
Amusement and Recreation (Indoors)
Bicycle Assembly, Parts and Accessories
Broadcast Studio \ Recording Studio (No Audience)
Coffee Shop \ Tea Stall
Concert Hall, Stage Shows
Construction, Survey, Soil Testing Firms

<b>Conditionally permitted commercial activities</b>
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 B.7: Land Use Permitted**

<b>Permitted Rural Settlement</b>
Agricultural Dwellings
Animal Husbandry
Animal Shelter
Graveyard \ Cemetery



<b>Permitted Rural Settlement</b>
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
Mosque, Place Of Worship
Newspaper Stand
Nursery School
orphanage
Outdoor Religious Events (Eidgah)
Playing Field
Satellite Dish Antenna
NGO \ CBO Facilities
Special Dwelling (E.G. Dorm For Physically Challenged Etc.)
Temporary Shed \ Tent
Specialized School: Dance, Art, Music, Physically Challenged & Others
Static Electrical Sub Stations
Transmission Lines
Utility Lines
Woodlot
Plantation (Except Narcotic Plant)
Social Forestry
Memorial Structure

Source: Compiled by the Consultants

### **Land Use Conditionally Permitted**

The following uses may be permitted or disallowed in this zone after review and approval by the authority/committee following appropriate procedure while the application meets the criteria mentioned in the requirement.

**Table No. B.8: Land Use Conditionally Permitted**

<b>Conditionally permitted uses under Rural Settlement</b>
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 B.11: Land Use Permitted**

<b>Permitted uses in Mixed Use Zone</b>
Accounting, Auditing or Bookkeeping Services
Addiction Treatment Center
Billboards, Advertisements & Advertising Structure
Agricultural Sales and Services
Antique Store
Appliance Store
Art Gallery, Art Studio \ Workshop
Artisan's Shop
Assisted Living or Elderly Home
Auditorium, Coliseum, Meeting Halls, and Conference Facilities, Convention
Auto Leasing or Rental Office
Automobile Wash
Automobile Driving Academy
Confectionery Shop
Bakery or Confectionery Retail
Bank & Financial Institution
Barber Shop
Bicycle Shop
Billiard Parlor \ Pool Hall
Blacksmith
Boarding and Rooming House
Book or Stationery Store or Newsstand
Bus Passenger Shelter
Child Daycare \ Preschool
Cleaning \ Laundry Shop
Commercial Recreational Buildings
Communication Service Facilities
Communication Tower Within Permitted Height
Community Center
Condominium or Apartment
Correctional Institution
Courier Service
Cyber Café
Daycare Center (Commercial or Nonprofit)
Doctor \ Dentist Chamber
Employee Housing
Fabric Store
Fast Food Establishment \ Food Kiosk
Funeral Services
General Store
Grocery Store
Guest House
Hospital
Jewelry and Silverware Sales
Landscape and Horticultural Services
Mosque, Place Of Worship
Newspaper Stand
Nursery School

<b>Permitted uses in Mixed Use Zone</b>
Photocopying and Duplicating Services
Pipelines and Utility Lines
Primary School
Project Identification Signs
Property Management Signs
Public Transport Facility
Resort
Satellite Dish Antenna
Shelter (Passers By)
Shoe Repair or Shoeshine Shop (Small)
Slaughter House
Social organization
Software Development
Special Dwelling
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 B.12: Land Use Conditionally Permitted**

<b>Conditionally permitted uses in Mixed Use Zone</b>
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

Conditionally permitted uses in Mixed Use Zone
Craft Workshop
Crematorium
Plantation (Except Narcotic Plant)
Cultural Exhibits and Libraries
Department Stores, Furniture & Variety Stores
Drug Store or Pharmacy
Energy Installation
Fitness Centre
Flowers, Nursery Stock and Florist Supplies
Freight Handling, Storage & Distribution
Freight Transport Facility
Gaming Clubs
Garages
Garden Center or Retail Nursery
Commercial Office
Project Office
Government Office
Hotel or Motel
Household Appliance and Furniture Repair Service
Indoor Amusement Centers, Game Arcades
Indoor Theatre
Lithographic or Print Shop
Market (Bazar)
Health Office, Dental Laboratory, Clinic or Lab
Musical Instrument Sales or Repair
Optical Goods Sales
Outdoor Café
Outdoor Fruit and Vegetable Markets
Painting and Wallpaper Sales
Paints and Varnishes
Patio Homes
Photofinishing Laboratory & Studio
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 B.13: Land Use Permitted**

Permitted uses under Education & Research Zone
--

<b>Permitted uses under Education &amp; Research Zone</b>
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
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 B.14: Land Use Conditionally Permitted**

<b>Conditionally permitted uses under Education and Research Zone</b>
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 B.15: Land Use Permitted**

<b>Permitted uses under Government Office Zone</b>
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

<b>Permitted uses under Government Office Zone</b>
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 B.16: Land Use Conditionally Permitted**

<b>Conditionally permitted uses under Government office</b>
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



<b>Conditionally permitted uses under Government office</b>
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 B.17: Land Use Permitted**

<b>Permitted uses under Agricultural Zone</b>
Food Grain Cultivation
Vegetable Cultivation
Cash Crop Cultivation
Horticulture
Arboriculture
Dairy Farming
Deep Tube Well
Shallow Tube Well
Irrigation Facilities (Irrigation Canal, Culvert, Flood Wall etc)
Temporary Structure (Agricultural)
Animal Shelter
Duckery
Aquatic Recreation Facility (Without Structure)
Tree Plantation (Except Narcotic Plant)
Aquaculture
Static Transformer Stations
Transmission Lines
Utility Lines
Woodlot
Social Forestry

Source: Compiled by the Consultants

### **Land Use Conditionally Permitted**

**Table B.18: 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 B.19: Land Use Permitted**

Permitted uses under Open Space
Botanical Garden & Arboretum
Bus Passenger Shelter
Caravan Park \ Camping Ground
Carnivals and Fairs
Circus
Plantation (Except Narcotic Plant)
Landscape and Horticultural Services
Open Theater
Park and Recreation Facilities (General)
Pipelines and Utility Lines
Playing Field
Special Function Tent
Tennis Club
Transmission Lines
Urban-Nature Reserve
Utility Lines
Woodlot
Zoo
Roadside Parking
Social Forestry
Memorial Structure

Source: Compiled by the Consultants

#### Landuse Conditionally Permitted

**Table B.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 B.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 B.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 perm

**ANNEXURE C:  
Resolution of Final Consultation Meeting and Attendance List.**

## ANNEXURE D:

### List of proposed new roads

Road Id	Road Type	Width (ft)	Length (m)	Phase
R16	Tertiary	30	402.961	3rd Phase
R24	Tertiary	30	828.774	2nd Phase
R55	Tertiary	30	1161.059	1st Phase
R55	Tertiary	30	1190.103	1st Phase
R22	Tertiary	30	2427.983	1st Phase
		Total	6010.880	
R19	Access	20	1193.038	3rd Phase
R21	Access	20	747.586	3rd Phase
R29	Access	20	547.119	3rd Phase
R54	Access	20	1491.566	1st Phase
R65	Access	20	1308.736	3rd Phase
R70	Access	20	458.059	3rd Phase
R72	Access	20	972.916	3rd Phase
R86	Access	20	513.351	1st Phase
R87	Access	20	303.309	3rd Phase
R88	Access	20	626.137	3rd Phase
R89	Access	20	590.167	2nd Phase
R90	Access	20	2727.272	1st Phase
		Total	11479.256	
		Gross Total	17490.136	

### List of proposed widening roads

Road Id	Road Type	Width (ft)	Length (m)	Phase
R03	Primary	80	2128.8	3rd Phase
R12	Primary	80	6524.2	3rd Phase
R63	Primary	60	1794.7	1st Phase
R69	Primary	60	3900.5	1st Phase
R73	Primary	60	5767.0	1st Phase
R74	Primary	60	2907.8	3rd Phase
		Total	23023.1	
R43	Secondary	40	3631.9	1st Phase
R76	Secondary	40	1308.9	2nd Phase
R78	Secondary	40	1532.5	3rd Phase
R79	Secondary	40	4309.3	1st Phase
R82	Secondary	40	1510.1	3rd Phase
R37	Secondary	40	6184.2	1st Phase
R26	Secondary	40	1795.6	2nd Phase
		Total	20272.5	
R02	Tertiary	30	1127.9	3rd Phase
R04	Tertiary	30	1214.1	3rd Phase
R06	Tertiary	30	232.6	3rd Phase
R10	Tertiary	30	577.3	3rd Phase
R13	Tertiary	30	992.0	3rd Phase
R14	Tertiary	30	1799.0	3rd Phase
R15	Tertiary	30	324.2	3rd Phase
R20	Tertiary	30	791.7	3rd Phase
R27	Tertiary	30	509.5	3rd Phase
R28	Tertiary	30	694.0	2nd Phase
R30	Tertiary	30	1511.3	3rd Phase
R34	Tertiary	30	1354.4	2nd Phase
R38	Tertiary	30	1374.2	3rd Phase
R47	Tertiary	30	3348.4	2nd Phase
R48	Tertiary	30	1354.4	3rd Phase
R51	Tertiary	30	2060.5	1st Phase
R64	Tertiary	30	1047.9	3rd Phase
R67	Tertiary	30	2991.0	3rd Phase

R75	Tertiary	30	642.0	2nd Phase
R80	Tertiary	30	1058.3	2nd Phase
R81	Tertiary	30	358.4	3rd Phase
R83	Tertiary	30	1530.0	3rd Phase
R08	Tertiary	30	685.3	3rd Phase
		Total	27578.5	
R01	Access	20	526.6	3rd Phase
R05	Access	20	1180.1	3rd Phase
R07	Access	20	152.2	3rd Phase
R09	Access	20	1577.8	2nd Phase
R11	Access	20	1248.8	3rd Phase
R17	Access	20	214.7	3rd Phase
R18	Access	20	149.6	3rd Phase
R23	Access	20	519.1	3rd Phase
R25	Access	20	352.0	3rd Phase
R31	Access	20	1225.9	3rd Phase
R32	Access	20	134.6	3rd Phase
R33	Access	20	966.9	3rd Phase
R35	Access	20	853.0	3rd Phase
R36	Access	20	496.7	3rd Phase
R39	Access	20	977.9	3rd Phase
R49	Access	20	907.7	3rd Phase
R53	Access	20	826.7	3rd Phase
R56	Access	20	466.7	3rd Phase
R57	Access	20	1111.0	2nd Phase
R58	Access	20	1853.0	1st Phase
R59	Access	20	494.2	3rd Phase
R60	Access	20	1024.4	3rd Phase
R61	Access	20	1069.7	3rd Phase
R62	Access	20	661.5	3rd Phase
R66	Access	20	242.8	3rd Phase
R77	Access	20	1680.6	3rd Phase
R85	Access	20	445.6	3rd Phase
R44	Access	30	1085.8	1st Phase
R46	Access	20	1089.7	3rd Phase
R45	Access	30	2049.7	2nd Phase
R50	Access	20	801.3	3rd Phase
		Total	26386.4	
		Gross Total	97260.5	

## ANNEXURE E: Details of Drainage Network Proposal

Drain Id	Drain Type	Length (m)	Phase
PD06	Primary	2728.720	1st Phase
PD05	Primary	1495.478	3rd Phase
PD04	Primary	1681.282	1st Phase
PD03	Primary	1519.470	1st Phase
PD02	Primary	1576.595	3rd Phase
PD03	Primary	412.994	1st Phase
PD01	Primary	1.099	3rd Phase
PD03	Primary	1481.639	1st Phase
TD149	Primary	2113.725	1st Phase
TD148	Primary	2285.245	1st Phase
TD147	Primary	1012.187	1st Phase
TD146	Primary	1986.784	1st Phase
TD145	Primary	951.057	1st Phase
TD144	Primary	2177.955	1st Phase
TD143	Primary	738.406	1st Phase
TD142	Primary	351.423	1st Phase
TD154	Primary	2368.917	1st Phase
TD140	Primary	1062.798	1st Phase
TD154	Primary	1979.953	1st Phase
TD138	Primary	960.450	1st Phase
TD137	Primary	1017.584	1st Phase
TD136	Primary	1729.250	1st Phase
TD135	Primary	1045.142	1st Phase
TD141	Primary	1556.726	1st Phase
TD150	Primary	1134.900	1st Phase
TD152	Primary	2825.261	1st Phase
TD153	Primary	2526.401	1st Phase
TD139	Primary	1536.619	1st Phase
TD151	Primary	1506.096	1st Phase
TD149	Primary	1037.491	1st Phase
TD145	Primary	466.337	1st Phase
PD04	Primary	1319.401	1st Phase
TD154	Primary	289.071	1st Phase
TD144	Primary	838.442	1st Phase
TD144	Primary	1253.384	1st Phase
	Total	48968.282	
SD11	Secondary	1510.401	1st Phase
SD10	Secondary	1772.032	1st Phase
SD09	Secondary	1980.065	1st Phase
SD08	Secondary	1725.728	2nd Phase
SD10	Secondary	190.764	1st Phase
SD10	Secondary	0.540	1st Phase
SD10	Secondary	983.041	1st Phase
	Total	8162.571	
TD13	Tertiary	684.047	1st Phase
TD14	Tertiary	507.201	1st Phase
TD15	Tertiary	3080.457	1st Phase
TD16	Tertiary	657.961	1st Phase
TD17	Tertiary	1065.771	1st Phase
TD18	Tertiary	738.528	1st Phase
TD19	Tertiary	702.155	3rd Phase
TD20	Tertiary	369.766	3rd Phase
TD21	Tertiary	404.158	3rd Phase
TD22	Tertiary	360.794	3rd Phase
TD23	Tertiary	168.252	3rd Phase
TD24	Tertiary	253.233	3rd Phase
TD25	Tertiary	637.490	2nd Phase

TD26	Tertiary	822.180	1st Phase
TD27	Tertiary	212.538	3rd Phase
TD28	Tertiary	796.594	3rd Phase
TD29	Tertiary	255.787	3rd Phase
TD30	Tertiary	512.763	3rd Phase
TD31	Tertiary	516.281	2nd Phase
TD32	Tertiary	623.106	2nd Phase
TD35	Tertiary	483.058	3rd Phase
TD36	Tertiary	692.777	3rd Phase
TD37	Tertiary	522.305	3rd Phase
TD38	Tertiary	515.057	1st Phase
TD41	Tertiary	407.574	3rd Phase
TD42	Tertiary	21.890	3rd Phase
TD43	Tertiary	499.929	3rd Phase
TD45	Tertiary	7.391	3rd Phase
TD46	Tertiary	320.796	3rd Phase
TD47	Tertiary	213.404	3rd Phase
TD48	Tertiary	325.485	1st Phase
TD50	Tertiary	1058.963	1st Phase
TD51	Tertiary	29.887	1st Phase
TD53	Tertiary	387.493	3rd Phase
TD54	Tertiary	469.013	3rd Phase
TD55	Tertiary	544.244	3rd Phase
TD56	Tertiary	454.270	3rd Phase
TD57	Tertiary	787.761	3rd Phase
TD58	Tertiary	512.512	1st Phase
TD59	Tertiary	192.298	3rd Phase
TD60	Tertiary	140.873	3rd Phase
TD61	Tertiary	141.349	3rd Phase
TD62	Tertiary	415.605	3rd Phase
TD119	Tertiary	65.295	3rd Phase
TD64	Tertiary	288.714	3rd Phase
TD65	Tertiary	913.390	3rd Phase
TD132	Tertiary	976.385	3rd Phase
TD68	Tertiary	8.415	1st Phase
TD70	Tertiary	11.312	3rd Phase
TD71	Tertiary	353.442	3rd Phase
TD72	Tertiary	230.777	3rd Phase
TD74	Tertiary	61.553	1st Phase
TD75	Tertiary	374.861	3rd Phase
TD76	Tertiary	529.296	3rd Phase
TD77	Tertiary	357.954	1st Phase
TD78	Tertiary	697.493	3rd Phase
TD79	Tertiary	1275.942	1st Phase
TD80	Tertiary	704.739	3rd Phase
TD81	Tertiary	267.625	3rd Phase
TD82	Tertiary	854.374	3rd Phase
TD83	Tertiary	330.794	3rd Phase
TD84	Tertiary	315.361	3rd Phase
TD85	Tertiary	1117.232	2nd Phase
TD86	Tertiary	433.602	3rd Phase
TD88	Tertiary	133.665	3rd Phase
TD89	Tertiary	659.696	3rd Phase
TD93	Tertiary	151.073	3rd Phase
TD94	Tertiary	427.513	2nd Phase
TD95	Tertiary	12.743	2nd Phase
TD96	Tertiary	3.798	2nd Phase
TD97	Tertiary	392.716	2nd Phase
TD98	Tertiary	352.882	2nd Phase
TD99	Tertiary	49.361	3rd Phase
TD100	Tertiary	266.142	3rd Phase
TD101	Tertiary	349.962	3rd Phase



TD102	Tertiary	1124.768	3rd Phase
TD103	Tertiary	648.222	3rd Phase
TD104	Tertiary	540.185	3rd Phase
TD111	Tertiary	806.510	3rd Phase
TD112	Tertiary	699.731	3rd Phase
TD113	Tertiary	399.113	3rd Phase
TD114	Tertiary	283.367	3rd Phase
TD115	Tertiary	792.595	2nd Phase
TD117	Tertiary	824.782	2nd Phase
TD123	Tertiary	868.547	3rd Phase
TD124	Tertiary	701.007	3rd Phase
TD125	Tertiary	666.769	3rd Phase
TD128	Tertiary	776.415	3rd Phase
TD129	Tertiary	238.547	2nd Phase
TD38	Tertiary	0.988	1st Phase
TD38	Tertiary	0.698	1st Phase
	Total	44853.347	
	Gross Total	101984.200	

## ANNEXURE F: Mouza Schedule of Development Proposal

Proposed Facility	Ward Name	Mouza Name	Plot No	Phasing	Acres
Proposed Shoshan Ghat 01	Ward No. 03	Char Fathebahadurpur (424_05)	3725, 3728, 3729	2 <sup>nd</sup> Phase	0.170
Proposed Shoshan Ghat 02	Ward No. 02	Char Pangshya (293_00)	409	2 <sup>nd</sup> Phase	2.5
Proposed Overhead Tank	Ward No. 02	Char Thangamara (292_01)	409, 1520-24, 1534	3 <sup>rd</sup> Phase	1.599
Proposed Cow Market	Ward No. 02	Char Thangamara (292_01)	409	2 <sup>nd</sup> Phase	1.89
Proposed Graveyard 01	Ward No. 08	Uttar Janardandi (070_00)	75-78, 81-84	1 <sup>st</sup> Phase	6.07
Proposed Graveyard 02	Ward No. 01	Pangashia (079_02)	1011	1 <sup>st</sup> Phase	0.918
Proposed Stadium	Ward No. 08	Dakshin Janardandi (067_01)	23-26, 28, 29, 32, 33, 36-43, 45, 46, 91-100	3 <sup>rd</sup> Phase	13.47
Proposed Dumping Ground	Ward No. 09	Puali Madaripur (043_00)	23-25, 27-37	1 <sup>st</sup> Phase	2.9
Proposed Bus Terminal	Ward No. 09	Dakshin Gopalpur (044_00)	394, 395, 389	2 <sup>nd</sup> Phase	1.22
Proposed Truck Terminal	Ward No. 09	Gopalpur (045_00)	193,196-97	2 <sup>nd</sup> Phase	2.56
Proposed Auto Stand	Ward No. 01	Pangashia (079_01)	96	2 <sup>nd</sup> Phase	0.048
Proposed Slaughter House	Ward No. 01	Mazidbari (042_00)	93-95	2 <sup>nd</sup> Phase	0.371
Proposed Women College	Ward No. 01	Rajdi (078_02)	1013-15, 1017, 1018, 1020, 1021, 1077	3 <sup>rd</sup> Phase	2.451
Proposed College	Ward No. 09	Paschim Minajdi (066_02)	530-36	3 <sup>rd</sup> Phase	6.12
Proposed High School	Ward No. 06	Lakhimipur Pakhara (092_00)	542-45	3 <sup>rd</sup> Phase	1.108
Vocational Training Center	Ward No. 06	Lakhimipur Pakhara (092_00)	432-34,522-34	3 <sup>rd</sup> Phase	3.67
Proposed Park 01	Ward No. 07	Jhautala (086_00)	192-204	1 <sup>st</sup> Phase	7.17
Proposed Park 02	Ward No. 08	Uttar Janardandi (070_00)	27-50	1 <sup>st</sup> Phase	14.0
Proposed Children Park	Ward No. 02	Char Pangshya (293_00)	409	1 <sup>st</sup> Phase	3.47
Proposed University	Ward No. 04	Char Jhautala (087_00)	109-121,134-39	3 <sup>rd</sup> Phase	8.85
Proposed Playground 01	Ward No. 01	Pangashia (079_01)	142-49	3 <sup>rd</sup> Phase	1.006
Proposed Playground 02	Ward No. 09	Puali Madaripur (043_00)	154-160	3 <sup>rd</sup> Phase	0.96
Proposed Waste transfer Station 01	Ward No. 09	Paschim Minajdi (066_02)	543	3 <sup>rd</sup> Phase	0.33
Proposed Waste transfer Station 02	Ward No. 05	Char Krishnanagar (295_00)	607	3 <sup>rd</sup> Phase	0.094
Proposed Eidgha	Ward No. 01	Pangashia (079_02)	1014-16	3 <sup>rd</sup> Phase	1.62
Proposed Ward Center 01	Ward No. 01	Rajdi (078_02)	1261	1 <sup>st</sup> Phase	0.55
Proposed Ward Center 02	Ward No. 02	UttarThengamara (082_00)	205	3 <sup>rd</sup> Phase	0.59
Proposed Ward Center 03	Ward No. 03	Char Fathebahadurpur (424_04)	1638	3 <sup>rd</sup> Phase	0.81
Proposed Ward Center 04	Ward No. 04	Char Jhautala (087_00)	97	1 <sup>st</sup> Phase	0.37
Proposed Ward Center 05	Ward No. 05	Char Sadipur (304_00)	490-92	2 <sup>nd</sup> Phase	0.54
Proposed Ward Center 06	Ward No. 06	Lakhimipur Pakhara (092_00)	478	1 <sup>st</sup> Phase	0.69
Proposed Ward Center 07	Ward No. 07	Rajdi (078_01)	620	3 <sup>rd</sup> Phase	0.74
Proposed Ward Center 08	Ward No. 08	Dakshin Janardandi (067_01)	381	1 <sup>st</sup> Phase	0.36

Proposed Facility	Ward Name	Mouza Name	Plot No	Phasing	Acres
Proposed Ward Center 09	Ward No. 09	Gopalpur (045_00)	176	2 <sup>nd</sup> Phase	0.62
			Total		74.9

## ANNEXURE G: Mouza Schedule of Proposed Retention Ponds

Id	Mouza Name	Plot No.
RP1	Rajdi (078_01)	835
RP104	Paschim Minajdi (066_01)	369
RP104	Paschim Minajdi (066_01)	370
RP105	Paschim Minajdi (066_01)	367
RP105	Paschim Minajdi (066_01)	368
RP105	Paschim Minajdi (066_01)	369
RP107	Paschim Minajdi (066_01)	377
RP108	Paschim Minajdi (066_02)	633
RP108	Paschim Minajdi (066_02)	634
RP109	Paschim Minajdi (066_01)	321
RP109	Paschim Minajdi (066_01)	361
RP109	Paschim Minajdi (066_01)	362
RP11	Rajdi (078_01)	361
RP11	Rajdi (078_01)	362
RP11	Rajdi (078_01)	363
RP11	Rajdi (078_01)	364
RP11	Rajdi (078_01)	559
RP110	Paschim Minajdi (066_01)	380
RP111	Puali Madaripur (043_00)	40
RP111	Puali Madaripur (043_00)	42
RP113	Paschim Minajdi (066_02)	642
RP115	Paschim Minajdi (066_02)	640
RP117	Puali Madaripur (043_00)	101
RP117	Puali Madaripur (043_00)	102
RP119	Puali Madaripur (043_00)	75
RP119	Puali Madaripur (043_00)	76
RP12	Rajdi (078_01)	549
RP120	Puali Madaripur (043_00)	71
RP122	Paschim Minajdi (066_02)	675
RP126	Paschim Minajdi (066_02)	679
RP126	Paschim Minajdi (066_02)	681
RP128	Puali Madaripur (043_00)	144
RP130	Dakshin Janardandi (067_02)	641
RP131	Dakshin Janardandi (067_02)	638
RP131	Dakshin Janardandi (067_02)	639
RP132	Rajdi (078_01)	70
RP132	Rajdi (078_01)	71
RP132	Rajdi (078_01)	74
RP135	Rajdi (078_01)	439
RP135	Rajdi (078_01)	440
RP135	Rajdi (078_01)	444
RP135	Rajdi (078_01)	445
RP136	Rajdi (078_01)	434
RP136	Rajdi (078_01)	437
RP136	Rajdi (078_01)	438
RP137	Rajdi (078_01)	428
RP137	Rajdi (078_01)	431
RP138	Paschim Minajdi (066_01)	416
RP138	Paschim Minajdi (066_01)	445

Id	Mouza Name	Plot No.
RP139	Paschim Minajdi (066_02)	506
RP140	Paschim Minajdi (066_02)	503
RP141	Paschim Minajdi (066_02)	520
RP142	Paschim Minajdi (066_02)	504
RP142	Paschim Minajdi (066_02)	509
RP142	Paschim Minajdi (066_02)	518
RP142	Paschim Minajdi (066_02)	519
RP143	Paschim Minajdi (066_01)	411
RP143	Paschim Minajdi (066_01)	421
RP145	Rajdi (078_01)	5
RP145	Rajdi (078_01)	7
RP146	Paschim Minajdi (066_02)	579
RP146	Paschim Minajdi (066_02)	581
RP148	Paschim Minajdi (066_02)	753
RP148	Paschim Minajdi (066_02)	767
RP148	Paschim Minajdi (066_02)	768
RP150	Paschim Minajdi (066_02)	589
RP153	Rajdi (078_01)	14
RP153	Rajdi (078_01)	15
RP157	Lamchari (298_02)	599
RP157	Lamchari (298_02)	600
RP157	Lamchari (298_02)	602
RP159	Char Krishnanagar (295_00)	396
RP159	Char Krishnanagar (295_00)	399
RP159	Char Krishnanagar (295_00)	400
RP161	Lamchari (298_02)	588
RP161	Lamchari (298_02)	589
RP161	Lamchari (298_02)	592
RP164	Lamchari (298_02)	561
RP164	Lamchari (298_02)	663
RP168	Pangashia (079_01)	348
RP168	Pangashia (079_01)	349
RP168	Pangashia (079_01)	350
RP169	Jhautala (086_00)	207
RP17	Rajdi (078_01)	807
RP17	Rajdi (078_01)	808
RP17	Rajdi (078_01)	840
RP171	Pangashia (079_01)	132
RP172	Pangashia (079_01)	133
RP172	Pangashia (079_01)	134
RP173	Jhautala (086_00)	180
RP173	Jhautala (086_00)	181
RP173	Jhautala (086_00)	182
RP173	Jhautala (086_00)	183
RP173	Jhautala (086_00)	184
RP173	Jhautala (086_00)	187
RP174	Jhautala (086_00)	131
RP174	Jhautala (086_00)	132
RP174	Jhautala (086_00)	133

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP174	Jhautala (086_00)	134
RP174	Jhautala (086_00)	135
RP174	Jhautala (086_00)	136
RP174	Jhautala (086_00)	137
RP174	Jhautala (086_00)	138
RP174	Jhautala (086_00)	139
RP175	Jhautala (086_00)	140
RP175	Jhautala (086_00)	141
RP175	Jhautala (086_00)	142
RP175	Jhautala (086_00)	153
RP175	Jhautala (086_00)	154
RP178	Puali Madaripur (043_00)	125
RP18	Rajdi (078_01)	810
RP180	Puali Madaripur (043_00)	166
RP181	Puali Madaripur (043_00)	99
RP182	Puali Madaripur (043_00)	15
RP182	Puali Madaripur (043_00)	16
RP182	Puali Madaripur (043_00)	240
RP182	Puali Madaripur (043_00)	36
RP182	Puali Madaripur (043_00)	37
RP183	Puali Madaripur (043_00)	17
RP183	Puali Madaripur (043_00)	18
RP184	Puali Madaripur (043_00)	11
RP184	Puali Madaripur (043_00)	7
RP185	Puali Madaripur (043_00)	113
RP185	Puali Madaripur (043_00)	114
RP185	Puali Madaripur (043_00)	115
RP185	Puali Madaripur (043_00)	116
RP185	Puali Madaripur (043_00)	117
RP185	Puali Madaripur (043_00)	396
RP185	Puali Madaripur (043_00)	397
RP185	Puali Madaripur (043_00)	5
RP185	Puali Madaripur (043_00)	6
RP186	Puali Madaripur (043_00)	29
RP186	Puali Madaripur (043_00)	31
RP186	Puali Madaripur (043_00)	32
RP188	Gopalpur (045_00)	314
RP188	Gopalpur (045_00)	331
RP188	Gopalpur (045_00)	332
RP19	Rajdi (078_02)	1109
RP190	Gopalpur (045_00)	345
RP192	Dakshin Gopalpur (044_00)	366
RP193	Dakshin Gopalpur (044_00)	357
RP193	Dakshin Gopalpur (044_00)	360
RP194	Dakshin Gopalpur (044_00)	364
RP194	Dakshin Gopalpur (044_00)	366
RP197	Gopalpur (045_00)	355
RP197	Gopalpur (045_00)	363
RP197	Gopalpur (045_00)	364
RP197	Gopalpur (045_00)	366
RP197	Gopalpur (045_00)	368
RP198	Gopalpur (045_00)	192
RP198	Gopalpur (045_00)	352

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP198	Gopalpur (045_00)	353
RP198	Gopalpur (045_00)	354
RP198	Gopalpur (045_00)	355
RP198	Gopalpur (045_00)	373
RP198	Gopalpur (045_00)	374
RP199	Gopalpur (045_00)	173
RP199	Gopalpur (045_00)	367
RP199	Gopalpur (045_00)	369
RP199	Gopalpur (045_00)	370
RP199	Gopalpur (045_00)	371
RP199	Gopalpur (045_00)	372
RP199	Gopalpur (045_00)	373
RP199	Gopalpur (045_00)	375
RP199	Gopalpur (045_00)	376
RP199	Gopalpur (045_00)	377
RP199	Gopalpur (045_00)	378
RP2	Rajdi (078_02)	1110
RP2	Rajdi (078_02)	1112
RP2	Rajdi (078_02)	1113
RP200	Gopalpur (045_00)	198
RP201	Gopalpur (045_00)	201
RP202	Gopalpur (045_00)	391
RP202	Gopalpur (045_00)	396
RP203	Gopalpur (045_00)	544
RP205	Gopalpur (045_00)	546
RP205	Gopalpur (045_00)	597
RP206	Gopalpur (045_00)	547
RP206	Gopalpur (045_00)	599
RP207	Gopalpur (045_00)	387
RP207	Gopalpur (045_00)	393
RP210	Gopalpur (045_00)	337
RP210	Gopalpur (045_00)	338
RP211	Char Jhautala (087_00)	129
RP211	Char Jhautala (087_00)	132
RP211	Char Jhautala (087_00)	133
RP212	Char Jhautala (087_00)	123
RP212	Char Jhautala (087_00)	125
RP213	Char Jhautala (087_00)	154
RP215	Char Jhautala (087_00)	80
RP215	Char Jhautala (087_00)	81
RP216	Char Krishnanagar (295_00)	146
RP216	Char Krishnanagar (295_00)	147
RP216	Char Krishnanagar (295_00)	151
RP217	Bibhagdi (422_02)	1661
RP217	Bibhagdi (422_02)	1663
RP217	Bibhagdi (422_02)	1664
RP217	Bibhagdi (422_02)	1979
RP218	Bibhagdi (422_02)	1922
RP218	Bibhagdi (422_02)	1985
RP219	Shicarmangal (423_01)	174
RP219	Shicarmangal (423_01)	175
RP219	Shicarmangal (423_01)	177
RP220	Shicarmangal (423_01)	178

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP220	Shicarmangal (423_01)	179
RP222	Bibhagdi (422_02)	1770
RP222	Bibhagdi (422_02)	1771
RP222	Bibhagdi (422_02)	1772
RP224	Bibhagdi (422_02)	1742
RP224	Bibhagdi (422_02)	1745
RP225	Bibhagdi (422_02)	1795
RP225	Bibhagdi (422_02)	1796
RP225	Bibhagdi (422_02)	1797
RP225	Bibhagdi (422_02)	1800
RP225	Bibhagdi (422_02)	1801
RP225	Shicarmangal (423_01)	215
RP225	Shicarmangal (423_01)	665
RP229	Char Fathebahadurpur (424_04)	2845
RP229	Char Fathebahadurpur (424_04)	2846
RP230	Char Fathebahadurpur (424_04)	2885
RP231	Bibhagdi (422_02)	1880
RP231	Bibhagdi (422_02)	1984
RP233	Char Fathebahadurpur (424_04)	2890
RP233	Char Fathebahadurpur (424_04)	2894
RP233	Char Fathebahadurpur (424_04)	2895
RP234	Char Fathebahadurpur (424_04)	2895
RP234	Char Fathebahadurpur (424_04)	2896
RP234	Char Fathebahadurpur (424_04)	2897
RP234	Char Fathebahadurpur (424_04)	2919
RP235	Char Fathebahadurpur (424_04)	2919
RP235	Char Fathebahadurpur (424_04)	2922
RP235	Char Fathebahadurpur (424_04)	2923
RP235	Char Fathebahadurpur (424_04)	2948
RP236	Char Fathebahadurpur (424_04)	2947
RP236	Char Fathebahadurpur (424_04)	2948
RP236	Char Fathebahadurpur (424_04)	2949
RP236	Char Fathebahadurpur (424_04)	2952
RP237	Char Fathebahadurpur (424_04)	2948
RP237	Char Fathebahadurpur (424_04)	2949
RP237	Char Fathebahadurpur (424_04)	2951
RP237	Char Fathebahadurpur (424_04)	2952
RP238	Char Fathebahadurpur (424_04)	2955
RP239	Char Fathebahadurpur (424_04)	2956
RP24	Rajdi (078_02)	1122
RP240	Bibhagdi (422_02)	1832
RP240	Bibhagdi (422_02)	1980
RP241	Bibhagdi (422_02)	1882
RP241	Bibhagdi (422_02)	1885
RP242	Bibhagdi (422_02)	1804
RP242	Bibhagdi (422_02)	1877
RP243	Bibhagdi (422_02)	1876
RP243	Bibhagdi (422_02)	1983
RP244	Bibhagdi (422_02)	1874
RP244	Bibhagdi (422_02)	1982
RP245	Bibhagdi (422_02)	1837
RP245	Bibhagdi (422_02)	1839
RP245	Bibhagdi (422_02)	1840

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP245	Bibhagdi (422_02)	1842
RP245	Bibhagdi (422_02)	1864
RP246	Bibhagdi (422_02)	1842
RP246	Bibhagdi (422_02)	1846
RP247	Bibhagdi (422_02)	1613
RP247	Bibhagdi (422_02)	1614
RP247	Bibhagdi (422_02)	1615
RP247	Bibhagdi (422_02)	1859
RP247	Bibhagdi (422_02)	1863
RP247	Char Fathebahadurpur (424_04)	1863
RP247	Char Fathebahadurpur (424_04)	1886
RP247	Bibhagdi (422_02)	1927
RP247	Bibhagdi (422_02)	1971
RP247	Char Fathebahadurpur (424_04)	2704
RP247	Char Fathebahadurpur (424_04)	2803
RP247	Char Fathebahadurpur (424_04)	2813
RP247	Char Fathebahadurpur (424_04)	2842
RP247	Char Fathebahadurpur (424_04)	2843
RP247	Char Fathebahadurpur (424_04)	2845
RP247	Char Fathebahadurpur (424_04)	2877
RP247	Char Fathebahadurpur (424_04)	2886
RP247	Char Fathebahadurpur (424_04)	2887
RP247	Char Fathebahadurpur (424_04)	2893
RP247	Bibhagdi (422_02)	2921
RP247	Char Fathebahadurpur (424_04)	2921
RP247	Char Fathebahadurpur (424_04)	2955
RP247	Char Fathebahadurpur (424_04)	2958
RP247	Char Fathebahadurpur (424_04)	2962
RP249	Purbba Minajdi (068_00)	286
RP249	Purbba Minajdi (068_00)	287
RP249	Purbba Minajdi (068_00)	288
RP25	Rajdi (078_02)	1235
RP25	Rajdi (078_02)	1236
RP25	Rajdi (078_02)	1240
RP25	Rajdi (078_02)	1241
RP25	Rajdi (078_02)	1343
RP258	Purbba Minajdi (068_00)	228
RP258	Purbba Minajdi (068_00)	229
RP259	Purbba Minajdi (068_00)	224
RP259	Purbba Minajdi (068_00)	225
RP259	Purbba Minajdi (068_00)	229
RP260	Uttar Janardandi (070_00)	52
RP261	Uttar Janardandi (070_00)	47
RP262	Uttar Janardandi (070_00)	53
RP262	Uttar Janardandi (070_00)	54
RP262	Uttar Janardandi (070_00)	55
RP263	Uttar Janardandi (070_00)	76
RP264	Uttar Janardandi (070_00)	75
RP265	Uttar Janardandi (070_00)	62
RP265	Uttar Janardandi (070_00)	63
RP266	Uttar Janardandi (070_00)	64
RP266	Uttar Janardandi (070_00)	75
RP268	Uttar Janardandi (070_00)	66

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP268	Uttar Janardandi (070_00)	74
RP269	Uttar Janardandi (070_00)	5
RP269	Uttar Janardandi (070_00)	56
RP27	Rajdi (078_02)	1325
RP270	Uttar Janardandi (070_00)	2
RP270	Uttar Janardandi (070_00)	3
RP270	Uttar Janardandi (070_00)	56
RP270	Uttar Janardandi (070_00)	57
RP270	Uttar Janardandi (070_00)	58
RP272	Gopalpur (045_00)	227
RP272	Gopalpur (045_00)	228
RP273	Gopalpur (045_00)	312
RP274	Gopalpur (045_00)	306
RP275	Gopalpur (045_00)	264
RP275	Gopalpur (045_00)	265
RP275	Gopalpur (045_00)	266
RP275	Gopalpur (045_00)	267
RP276	Dakshin Janardandi (067_01)	61
RP277	Dakshin Janardandi (067_01)	65
RP279	Dakshin Janardandi (067_01)	120
RP279	Dakshin Janardandi (067_01)	124
RP279	Dakshin Janardandi (067_01)	125
RP279	Dakshin Janardandi (067_01)	126
RP279	Dakshin Janardandi (067_01)	127
RP279	Dakshin Janardandi (067_01)	144
RP279	Dakshin Janardandi (067_01)	425
RP280	Dakshin Janardandi (067_01)	223
RP280	Dakshin Janardandi (067_01)	229
RP280	Dakshin Janardandi (067_01)	230
RP280	Dakshin Janardandi (067_01)	231
RP280	Dakshin Janardandi (067_01)	232
RP281	Dakshin Janardandi (067_01)	228
RP281	Dakshin Janardandi (067_01)	229
RP283	Dakshin Janardandi (067_01)	207
RP283	Dakshin Janardandi (067_01)	208
RP283	Dakshin Janardandi (067_01)	209
RP283	Dakshin Janardandi (067_01)	214
RP287	Pangashia (079_02)	1052
RP288	Pangashia (079_02)	1104
RP289	Pangashia (079_02)	1052
RP289	Pangashia (079_02)	1101
RP290	Pangashia (079_02)	1104
RP290	Pangashia (079_02)	1108
RP292	Pangashia (079_02)	1178
RP292	Pangashia (079_02)	1179
RP294	Pangashia (079_02)	1110
RP294	Pangashia (079_02)	1111
RP294	Pangashia (079_02)	1112
RP294	Pangashia (079_02)	1114
RP295	Pangashia (079_02)	1108
RP295	Pangashia (079_02)	1109
RP295	Pangashia (079_02)	1110
RP299	Pangashia (079_02)	972

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP30	Rajdi (078_02)	1226
RP30	Rajdi (078_02)	1227
RP30	Rajdi (078_02)	1228
RP30	Rajdi (078_02)	1258
RP300	Pangashia (079_02)	965
RP300	Pangashia (079_02)	966
RP302	Pangashia (079_02)	1337
RP302	Pangashia (079_02)	1338
RP303	Pangashia (079_02)	1002
RP303	Pangashia (079_02)	1018
RP303	Pangashia (079_02)	903
RP303	Pangashia (079_02)	913
RP303	Pangashia (079_02)	914
RP303	Pangashia (079_02)	972
RP303	Pangashia (079_02)	973
RP303	Pangashia (079_02)	975
RP303	Pangashia (079_02)	979
RP303	Pangashia (079_02)	981
RP304	Mazidbari (042_00)	147
RP304	Mazidbari (042_00)	149
RP304	Mazidbari (042_00)	41
RP305	Mazidbari (042_00)	163
RP305	Mazidbari (042_00)	164
RP305	Mazidbari (042_00)	165
RP305	Mazidbari (042_00)	166
RP305	Mazidbari (042_00)	167
RP305	Mazidbari (042_00)	168
RP305	Mazidbari (042_00)	169
RP305	Mazidbari (042_00)	170
RP306	Mazidbari (042_00)	170
RP307	Mazidbari (042_00)	180
RP31	Rajdi (078_02)	1225
RP310	Puali Madaripur (043_00)	226
RP311	Mazidbari (042_00)	152
RP311	Dakshin Gopalpur (044_00)	397
RP311	Dakshin Gopalpur (044_00)	405
RP313	Puali Madaripur (043_00)	215
RP313	Puali Madaripur (043_00)	216
RP313	Puali Madaripur (043_00)	218
RP314	Puali Madaripur (043_00)	202
RP314	Puali Madaripur (043_00)	220
RP315	Puali Madaripur (043_00)	214
RP315	Puali Madaripur (043_00)	396
RP315	Puali Madaripur (043_00)	397
RP318	Rajdi (078_02)	1048
RP319	Rajdi (078_02)	1044
RP319	Rajdi (078_02)	1048
RP319	Rajdi (078_02)	1057
RP32	Rajdi (078_02)	1460
RP32	Rajdi (078_02)	1464
RP32	Rajdi (078_02)	1468
RP32	Rajdi (078_02)	1469
RP320	Rajdi (078_02)	1048

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP322	Rajdi (078_02)	1048
RP322	Rajdi (078_02)	1051
RP322	Rajdi (078_02)	1052
RP322	Rajdi (078_02)	1054
RP323	Char Krishnanagar (295_00)	599
RP323	Char Krishnanagar (295_00)	602
RP323	Char Krishnanagar (295_00)	603
RP324	Char Krishnanagar (295_00)	597
RP324	Char Krishnanagar (295_00)	599
RP325	Char Krishnanagar (295_00)	612
RP325	Char Krishnanagar (295_00)	613
RP326	Char Krishnanagar (295_00)	1
RP326	Char Jhautala (087_00)	109
RP326	Char Jhautala (087_00)	111
RP326	Char Jhautala (087_00)	112
RP326	Char Jhautala (087_00)	113
RP326	Char Jhautala (087_00)	120
RP326	Char Jhautala (087_00)	121
RP326	Char Jhautala (087_00)	126
RP326	Char Jhautala (087_00)	127
RP326	Char Jhautala (087_00)	135
RP326	Char Jhautala (087_00)	137
RP326	Char Jhautala (087_00)	138
RP326	Char Jhautala (087_00)	139
RP326	Char Jhautala (087_00)	144
RP326	Char Jhautala (087_00)	145
RP326	Char Jhautala (087_00)	148
RP326	Char Jhautala (087_00)	149
RP326	Char Jhautala (087_00)	156
RP326	Char Jhautala (087_00)	159
RP326	Char Jhautala (087_00)	161
RP326	Char Jhautala (087_00)	177
RP326	Char Jhautala (087_00)	188
RP326	Char Jhautala (087_00)	189
RP326	Char Jhautala (087_00)	191
RP326	Char Jhautala (087_00)	194
RP326	Char Jhautala (087_00)	195
RP326	Char Jhautala (087_00)	196
RP326	Char Krishnanagar (295_00)	2
RP326	Char Bibhagdi (294_00)	32
RP326	Char Krishnanagar (295_00)	335
RP326	Char Krishnanagar (295_00)	336
RP326	Char Krishnanagar (295_00)	344
RP326	Char Krishnanagar (295_00)	427
RP326	Char Krishnanagar (295_00)	428
RP326	Char Krishnanagar (295_00)	440
RP326	Char Krishnanagar (295_00)	441
RP326	Char Krishnanagar (295_00)	592
RP326	Char Krishnanagar (295_00)	601
RP326	Char Krishnanagar (295_00)	689
RP326	Char Krishnanagar (295_00)	690
RP326	Char Jhautala (087_00)	97
RP327	Char Krishnanagar (295_00)	442

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP327	Char Krishnanagar (295_00)	589
RP328	Char Krishnanagar (295_00)	593
RP328	Char Krishnanagar (295_00)	597
RP329	Char Krishnanagar (295_00)	422
RP329	Char Krishnanagar (295_00)	426
RP329	Char Krishnanagar (295_00)	429
RP329	Char Krishnanagar (295_00)	430
RP330	Char Krishnanagar (295_00)	325
RP331	Bibhagdi (422_01)	295
RP331	Bibhagdi (422_01)	343
RP331	Bibhagdi (422_01)	344
RP331	Bibhagdi (422_01)	347
RP331	Bibhagdi (422_01)	351
RP331	Bibhagdi (422_01)	352
RP331	Bibhagdi (422_01)	354
RP333	Char Bibhagdi (294_00)	158
RP333	Char Bibhagdi (294_00)	160
RP333	Char Bibhagdi (294_00)	161
RP333	Char Bibhagdi (294_00)	162
RP333	Char Bibhagdi (294_00)	164
RP334	Char Bibhagdi (294_00)	146
RP334	Char Bibhagdi (294_00)	147
RP335	Char Bibhagdi (294_00)	142
RP337	Char Jhautala (087_00)	185
RP337	Char Jhautala (087_00)	186
RP338	Rajdi (078_02)	1449
RP338	Rajdi (078_02)	1450
RP338	Rajdi (078_02)	1479
RP339	Dakshin Janardandi (067_01)	416
RP339	Dakshin Janardandi (067_01)	417
RP34	Rajdi (078_02)	1421
RP341	Rajdi (078_01)	387
RP341	Rajdi (078_01)	388
RP341	Rajdi (078_01)	389
RP341	Rajdi (078_01)	390
RP343	Rajdi (078_01)	385
RP344	Dakshin Janardandi (067_01)	198
RP344	Dakshin Janardandi (067_01)	421
RP345	Rajdi (078_01)	108
RP345	Rajdi (078_01)	109
RP346	Rajdi (078_01)	107
RP348	Rajdi (078_01)	105
RP348	Rajdi (078_01)	106
RP349	Dakshin Janardandi (067_01)	184
RP35	Rajdi (078_02)	1427
RP35	Rajdi (078_02)	1428
RP353	Rajdi (078_01)	242
RP353	Rajdi (078_01)	244
RP353	Rajdi (078_01)	64
RP353	Rajdi (078_01)	66
RP354	Rajdi (078_01)	67
RP355	Char Krishnanagar (295_00)	1
RP355	Rajdi (078_01)	1



<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP355	Rajdi (078_02)	1001
RP355	Rajdi (078_02)	1002
RP355	Rajdi (078_02)	1003
RP355	Rajdi (078_02)	1004
RP355	Rajdi (078_02)	1034
RP355	Rajdi (078_02)	1046
RP355	Rajdi (078_02)	1047
RP355	Char Lakshimi (305_00)	105
RP355	Mazidbari (042_00)	1054
RP355	Rajdi (078_02)	1054
RP355	Pangashia (079_02)	1058
RP355	Char Lakshimi (305_00)	106
RP355	Rajdi (078_01)	106
RP355	Char Lakshimi (305_00)	107
RP355	Rajdi (078_01)	107
RP355	Rajdi (078_01)	108
RP355	Rajdi (078_01)	109
RP355	Rajdi (078_01)	11
RP355	Rajdi (078_02)	1109
RP355	Char Sadipur (304_00)	113
RP355	Char Sadipur (304_00)	114
RP355	Rajdi (078_01)	12
RP355	Dakshin Janardandi (067_01)	122
RP355	Dakshin Janardandi (067_01)	123
RP355	Dakshin Janardandi (067_01)	129
RP355	Rajdi (078_01)	131
RP355	Char Sadipur (304_00)	133
RP355	Rajdi (078_01)	133
RP355	Rajdi (078_01)	135
RP355	Pangashia (079_01)	1467
RP355	Rajdi (078_01)	15
RP355	Rajdi (078_01)	152
RP355	Dakshin Janardandi (067_02)	153
RP355	Rajdi (078_01)	153
RP355	Rajdi (078_01)	154
RP355	Rajdi (078_01)	155
RP355	Rajdi (078_01)	157
RP355	Rajdi (078_01)	158
RP355	Rajdi (078_01)	159
RP355	Rajdi (078_01)	160
RP355	Rajdi (078_01)	161
RP355	Rajdi (078_01)	163
RP355	Rajdi (078_01)	165
RP355	Rajdi (078_01)	166
RP355	Char Jhautala (087_00)	169
RP355	Jhautala (086_00)	169
RP355	Char Bibhagdi (294_00)	175
RP355	Rajdi (078_01)	177
RP355	Rajdi (078_01)	178
RP355	Dakshin Janardandi (067_01)	180
RP355	Rajdi (078_01)	180
RP355	Dakshin Janardandi (067_01)	181
RP355	Rajdi (078_01)	182

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP355	Rajdi (078_01)	183
RP355	Rajdi (078_01)	184
RP355	Char Lakshimi (305_00)	185
RP355	Pangashia (079_01)	186
RP355	Char Lakshimi (305_00)	192
RP355	Char Lakshimi (305_00)	194
RP355	Char Lakshimi (305_00)	195
RP355	Pangashia (079_01)	200
RP355	Pangashia (079_01)	201
RP355	Pangashia (079_01)	202
RP355	Pangashia (079_01)	203
RP355	Rajdi (078_01)	219
RP355	Rajdi (078_01)	220
RP355	Char Sadipur (304_00)	222
RP355	Char Sadipur (304_00)	223
RP355	Char Sadipur (304_00)	224
RP355	Char Sadipur (304_00)	225
RP355	Pangashia (079_01)	225
RP355	Char Sadipur (304_00)	227
RP355	Pangashia (079_01)	227
RP355	Pangashia (079_01)	230
RP355	Pangashia (079_01)	231
RP355	Pangashia (079_01)	232
RP355	Kashimpur 075_00	234
RP355	Char Sadipur (304_00)	235
RP355	Rajdi (078_01)	235
RP355	Char Sadipur (304_00)	236
RP355	Pangashia (079_01)	236
RP355	Pangashia (079_01)	237
RP355	Pangashia (079_01)	238
RP355	Pangashia (079_01)	240
RP355	Kashimpur 075_00	241
RP355	Pangashia (079_01)	241
RP355	Kashimpur 075_00	242
RP355	Dakshin Janardandi (067_01)	243
RP355	Kashimpur 075_00	243
RP355	Dakshin Janardandi (067_01)	244
RP355	Kashimpur 075_00	244
RP355	Dakshin Janardandi (067_01)	245
RP355	Kashimpur 075_00	247
RP355	Kashimpur 075_00	248
RP355	Kashimpur 075_00	251
RP355	Char Sadipur (304_00)	253
RP355	Char Sadipur (304_00)	256
RP355	Dakshin Janardandi (067_01)	256
RP355	Pangashia (079_01)	256
RP355	Dakshin Janardandi (067_01)	257
RP355	Char Lakshimi (305_00)	260
RP355	Char Lakshimi (305_00)	261
RP355	Char Lakshimi (305_00)	262
RP355	Char Lakshimi (305_00)	263
RP355	Char Lakshimi (305_00)	265
RP355	Dakshin Janardandi (067_01)	265

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP355	Char Lakshimi (305_00)	266
RP355	Char Lakshimi (305_00)	267
RP355	Char Lakshimi (305_00)	268
RP355	Char Lakshimi (305_00)	269
RP355	Char Sadipur (304_00)	269
RP355	Rajdi (078_01)	27
RP355	Char Lakshimi (305_00)	270
RP355	Char Sadipur (304_00)	270
RP355	Char Lakshimi (305_00)	271
RP355	Char Sadipur (304_00)	271
RP355	Char Lakshimi (305_00)	272
RP355	Char Lakshimi (305_00)	273
RP355	Char Sadipur (304_00)	273
RP355	Char Lakshimi (305_00)	274
RP355	Char Lakshimi (305_00)	275
RP355	Char Lakshimi (305_00)	276
RP355	Char Lakshimi (305_00)	277
RP355	Char Lakshimi (305_00)	279
RP355	Rajdi (078_01)	28
RP355	Char Lakshimi (305_00)	280
RP355	Char Lakshimi (305_00)	282
RP355	Char Lakshimi (305_00)	283
RP355	Char Lakshimi (305_00)	284
RP355	Char Lakshimi (305_00)	285
RP355	Char Lakshimi (305_00)	286
RP355	Char Lakshimi (305_00)	287
RP355	Char Lakshimi (305_00)	288
RP355	Pangashia (079_01)	288
RP355	Rajdi (078_01)	288
RP355	Char Lakshimi (305_00)	289
RP355	Pangashia (079_01)	289
RP355	Char Sadipur (304_00)	290
RP355	Pangashia (079_01)	290
RP355	Char Lakshimi (305_00)	291
RP355	Char Sadipur (304_00)	291
RP355	Rajdi (078_01)	291
RP355	Rajdi (078_01)	292
RP355	Pangashia (079_01)	295
RP355	Pangashia (079_01)	296
RP355	Char Sadipur (304_00)	297
RP355	Pangashia (079_01)	297
RP355	Char Sadipur (304_00)	300
RP355	Char Sadipur (304_00)	302
RP355	Char Sadipur (304_00)	308
RP355	Pangashia (079_01)	315
RP355	Char Sadipur (304_00)	316
RP355	Char Sadipur (304_00)	317
RP355	Char Sadipur (304_00)	330
RP355	Char Sadipur (304_00)	340
RP355	Rajdi (078_01)	344
RP355	Rajdi (078_01)	345
RP355	Rajdi (078_01)	350
RP355	Pangashia (079_01)	352

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP355	Char Lakshimi (305_00)	357
RP355	Char Lakshimi (305_00)	358
RP355	Pangashia (079_01)	362
RP355	Char Lakshimi (305_00)	363
RP355	Rajdi (078_01)	364
RP355	Char Lakshimi (305_00)	365
RP355	Rajdi (078_01)	365
RP355	Char Lakshimi (305_00)	366
RP355	Char Lakshimi (305_00)	367
RP355	Char Lakshimi (305_00)	369
RP355	Char Lakshimi (305_00)	370
RP355	Rajdi (078_01)	370
RP355	Dakshin Janardandi (067_01)	377
RP355	Dakshin Janardandi (067_01)	378
RP355	Rajdi (078_01)	378
RP355	Rajdi (078_01)	379
RP355	Dakshin Janardandi (067_01)	380
RP355	Dakshin Janardandi (067_01)	395
RP355	Rajdi (078_01)	395
RP355	Rajdi (078_01)	397
RP355	Rajdi (078_01)	400
RP355	Rajdi (078_01)	403
RP355	Rajdi (078_01)	404
RP355	Rajdi (078_01)	405
RP355	Dakshin Janardandi (067_01)	415
RP355	Pangashia (079_01)	416
RP355	Pangashia (079_01)	417
RP355	Dakshin Janardandi (067_01)	419
RP355	Rajdi (078_01)	419
RP355	Dakshin Janardandi (067_01)	420
RP355	Rajdi (078_01)	420
RP355	Rajdi (078_01)	421
RP355	Rajdi (078_01)	429
RP355	Rajdi (078_01)	435
RP355	Pangashia (079_01)	437
RP355	Pangashia (079_01)	441
RP355	Char Sadipur (304_00)	443
RP355	Pangashia (079_01)	444
RP355	Pangashia (079_01)	445
RP355	Rajdi (078_01)	445
RP355	Char Sadipur (304_00)	455
RP355	Char Sadipur (304_00)	456
RP355	Char Sadipur (304_00)	457
RP355	Char Sadipur (304_00)	461
RP355	Char Sadipur (304_00)	462
RP355	Char Sadipur (304_00)	469
RP355	Char Sadipur (304_00)	471
RP355	Char Sadipur (304_00)	473
RP355	Pangashia (079_01)	480
RP355	Pangashia (079_01)	482
RP355	Pangashia (079_01)	483
RP355	Pangashia (079_01)	484
RP355	Lamchhari (298_02)	490

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP355	Char Sadipur (304_00)	497
RP355	Rajdi (078_01)	5
RP355	Char Sadipur (304_00)	501
RP355	Char Sadipur (304_00)	502
RP355	Dakshin Janardandi (067_02)	502
RP355	Rajdi (078_01)	51
RP355	Char Sadipur (304_00)	512
RP355	Paschim Minajdi (066_02)	512
RP355	Dakshin Janardandi (067_02)	513
RP355	Dakshin Janardandi (067_02)	515
RP355	Lamchari (298_02)	515
RP355	Rajdi (078_01)	528
RP355	Rajdi (078_01)	53
RP355	Rajdi (078_01)	530
RP355	Paschim Minajdi (066_02)	536
RP355	Paschim Minajdi (066_02)	538
RP355	Paschim Minajdi (066_02)	539
RP355	Rajdi (078_01)	54
RP355	Paschim Minajdi (066_02)	542
RP355	Paschim Minajdi (066_02)	553
RP355	Rajdi (078_01)	557
RP355	Rajdi (078_01)	558
RP355	Paschim Minajdi (066_02)	560
RP355	Paschim Minajdi (066_02)	566
RP355	Dakshin Janardandi (067_02)	599
RP355	Rajdi (078_01)	6
RP355	Dakshin Janardandi (067_02)	600
RP355	Dakshin Janardandi (067_02)	625
RP355	Paschim Minajdi (066_02)	625
RP355	Dakshin Janardandi (067_02)	626
RP355	Paschim Minajdi (066_02)	626
RP355	Dakshin Janardandi (067_02)	627
RP355	Lamchari (298_02)	642
RP355	Paschim Minajdi (066_02)	649
RP355	Dakshin Janardandi (067_01)	65
RP355	Paschim Minajdi (066_02)	654
RP355	Paschim Minajdi (066_02)	664
RP355	Paschim Minajdi (066_02)	665
RP355	Paschim Minajdi (066_02)	666
RP355	Paschim Minajdi (066_02)	667
RP355	Paschim Minajdi (066_02)	669
RP355	Paschim Minajdi (066_02)	670
RP355	Paschim Minajdi (066_02)	672
RP355	Paschim Minajdi (066_02)	673
RP355	Rajdi (078_01)	7
RP355	Rajdi (078_01)	757
RP355	Rajdi (078_01)	758
RP355	Rajdi (078_01)	769
RP355	Rajdi (078_01)	770
RP355	Rajdi (078_01)	774
RP355	Paschim Minajdi (066_02)	788
RP355	Paschim Minajdi (066_02)	792
RP355	Paschim Minajdi (066_02)	809

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP355	Paschim Minajdi (066_02)	810
RP355	Rajdi (078_01)	810
RP355	Paschim Minajdi (066_02)	811
RP355	Paschim Minajdi (066_02)	812
RP355	Paschim Minajdi (066_02)	813
RP355	Paschim Minajdi (066_02)	814
RP355	Rajdi (078_01)	83
RP355	Rajdi (078_01)	835
RP355	Rajdi (078_01)	837
RP355	Rajdi (078_01)	838
RP355	Rajdi (078_01)	84
RP355	Rajdi (078_01)	840
RP355	Rajdi (078_01)	86
RP355	Paschim Minajdi (066_02)	862
RP355	Paschim Minajdi (066_02)	864
RP355	Rajdi (078_01)	87
RP355	Paschim Minajdi (066_02)	870
RP355	Paschim Minajdi (066_02)	876
RP355	Rajdi (078_01)	88
RP355	Paschim Minajdi (066_02)	880
RP355	Paschim Minajdi (066_02)	881
RP355	Paschim Minajdi (066_02)	882
RP355	Paschim Minajdi (066_02)	884
RP355	Paschim Minajdi (066_02)	885
RP355	Paschim Minajdi (066_02)	888
RP355	Paschim Minajdi (066_02)	889
RP355	Paschim Minajdi (066_02)	892
RP355	Paschim Minajdi (066_02)	894
RP355	Paschim Minajdi (066_02)	895
RP355	Paschim Minajdi (066_02)	896
RP355	Paschim Minajdi (066_02)	897
RP355	Paschim Minajdi (066_02)	898
RP355	Paschim Minajdi (066_02)	899
RP355	Paschim Minajdi (066_02)	901
RP355	Paschim Minajdi (066_02)	904
RP355	Dakshin Janardandi (067_02)	905
RP355	Paschim Minajdi (066_02)	905
RP355	Paschim Minajdi (066_02)	906
RP355	Paschim Minajdi (066_02)	907
RP355	Char Krishnanagar (295_00)	91
RP355	Paschim Minajdi (066_02)	924
RP355	Dakshin Janardandi (067_02)	927
RP355	Rajdi (078_01)	927
RP355	Dakshin Janardandi (067_02)	928
RP355	Dakshin Janardandi (067_02)	929
RP355	Rajdi (078_01)	929
RP355	Dakshin Janardandi (067_02)	930
RP355	Dakshin Janardandi (067_02)	931
RP355	Dakshin Janardandi (067_02)	932
RP355	Rajdi (078_01)	932
RP355	Dakshin Janardandi (067_02)	933
RP355	Dakshin Janardandi (067_02)	934
RP355	Dakshin Janardandi (067_02)	935

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP355	Dakshin Janardandi (067_02)	936
RP355	Dakshin Janardandi (067_02)	937
RP355	Char Krishnanagar (295_00)	94
RP355	Char Krishnanagar (295_00)	95
RP355	Char Sadipur (304_00)	99999
RP36	Rajdi (078_02)	1406
RP36	Rajdi (078_02)	1407
RP361	Lakhimpur Pakhara (092_00)	398
RP362	Lakhimpur Pakhara (092_00)	392
RP362	Lakhimpur Pakhara (092_00)	394
RP362	Lakhimpur Pakhara (092_00)	396
RP362	Lakhimpur Pakhara (092_00)	397
RP366	Lakhimpur Pakhara (092_00)	1017
RP366	Lakhimpur Pakhara (092_00)	1018
RP366	Lakhimpur Pakhara (092_00)	1024
RP366	Lakhimpur Pakhara (092_00)	1025
RP366	Lakhimpur Pakhara (092_00)	1029
RP366	Lakhimpur Pakhara (092_00)	1030
RP366	Lakhimpur Pakhara (092_00)	1031
RP366	Lakhimpur Pakhara (092_00)	1032
RP366	Lakhimpur Pakhara (092_00)	1033
RP369	Badardi (074_00)	83
RP37	Rajdi (078_02)	1403
RP37	Rajdi (078_02)	1404
RP370	Badardi (074_00)	87
RP371	Badardi (074_00)	95
RP371	Badardi (074_00)	96
RP372	Badardi (074_00)	113
RP373	Kashimpur 075_00	1
RP373	Kashimpur 075_00	146
RP373	Kashimpur 075_00	147
RP374	Kashimpur 075_00	1
RP374	Kashimpur 075_00	147
RP375	Kashimpur 075_00	2
RP376	Kashimpur 075_00	1
RP376	Kashimpur 075_00	3
RP376	Kashimpur 075_00	4
RP377	Kashimpur 075_00	16
RP378	Dakshin Janardandi (067_02)	520
RP379	Dakshin Janardandi (067_02)	537
RP379	Dakshin Janardandi (067_02)	538
RP379	Dakshin Janardandi (067_02)	539
RP379	Dakshin Janardandi (067_02)	540
RP38	Rajdi (078_02)	1324
RP380	Dakshin Janardandi (067_02)	518
RP381	Dakshin Janardandi (067_02)	563
RP382	Dakshin Janardandi (067_02)	580
RP382	Dakshin Janardandi (067_02)	581
RP382	Dakshin Janardandi (067_02)	583
RP385	Dakshin Janardandi (067_02)	684
RP385	Dakshin Janardandi (067_02)	685
RP385	Dakshin Janardandi (067_02)	687
RP385	Dakshin Janardandi (067_02)	688

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP389	Uttar Janardandi (070_00)	148
RP389	Dakshin Janardandi (067_02)	713
RP389	Dakshin Janardandi (067_02)	714
RP39	Rajdi (078_02)	1392
RP390	Uttar Janardandi (070_00)	159
RP390	Uttar Janardandi (070_00)	160
RP390	Uttar Janardandi (070_00)	161
RP390	Uttar Janardandi (070_00)	163
RP390	Uttar Janardandi (070_00)	164
RP393	Char Sadipur (304_00)	219
RP4	Rajdi (078_01)	348
RP4	Rajdi (078_01)	349
RP4	Rajdi (078_01)	350
RP40	Rajdi (078_02)	1340
RP40	Rajdi (078_02)	1341
RP405	Kashimpur 075_00	21
RP405	Kashtagar (091_00)	23
RP405	Kashimpur 075_00	24
RP405	Kashtagar (091_00)	24
RP405	Kashtagar (091_00)	25
RP405	Kashtagar (091_00)	26
RP405	Kashimpur 075_00	28
RP405	Kashimpur 075_00	29
RP405	Kashimpur 075_00	30
RP405	Kashimpur 075_00	31
RP405	Kashimpur 075_00	360
RP406	Pangashia (079_01)	612
RP406	Pangashia (079_01)	613
RP406	Pangashia (079_01)	614
RP407	Pangashia (079_01)	606
RP411	Pangashia (079_01)	560
RP411	Pangashia (079_01)	572
RP413	Pangashia (079_01)	538
RP413	Pangashia (079_01)	539
RP414	Pangashia (079_01)	540
RP417	Pangashia (079_01)	516
RP417	Pangashia (079_01)	517
RP417	Pangashia (079_01)	522
RP417	Pangashia (079_01)	523
RP417	Pangashia (079_01)	526
RP418	Pangashia (079_01)	509
RP418	Pangashia (079_01)	510
RP418	Pangashia (079_01)	521
RP420	Bibhagdi (422_02)	52
RP424	Bibhagdi (422_02)	1
RP424	Pangashia (079_01)	521
RP424	Pangashia (079_01)	569
RP424	Pangashia (079_01)	607
RP428	Bibhagdi (422_02)	423
RP428	Bibhagdi (422_02)	424
RP43	Rajdi (078_02)	1246
RP430	Shicarmangal (423_01)	711
RP430	Shicarmangal (423_01)	712

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP434	Shicarmangal (423_01)	118
RP434	Shicarmangal (423_01)	121
RP434	Shicarmangal (423_01)	122
RP436	Shicarmangal (423_01)	128
RP437	Shicarmangal (423_01)	128
RP437	Shicarmangal (423_01)	129
RP437	Shicarmangal (423_01)	140
RP439	Bibhagdi (422_02)	473
RP441	Shicarmangal (423_01)	168
RP441	Shicarmangal (423_01)	169
RP442	Bibhagdi (422_01)	248
RP442	Bibhagdi (422_01)	252
RP442	Bibhagdi (422_01)	253
RP442	Bibhagdi (422_01)	254
RP442	Bibhagdi (422_01)	255
RP443	Shicarmangal (423_01)	145
RP443	Shicarmangal (423_01)	146
RP443	Bibhagdi (422_02)	212
RP443	Bibhagdi (422_02)	455
RP443	Bibhagdi (422_02)	457
RP446	Kashtagar (091_00)	93
RP447	Kashtagar (091_00)	84
RP448	Kashtagar (091_00)	148
RP448	Kashtagar (091_00)	84
RP449	Kashtagar (091_00)	151
RP449	Kashtagar (091_00)	195
RP449	Kashtagar (091_00)	84
RP453	Pangashia (079_02)	30
RP454	Pangashia (079_02)	17
RP455	Pangashia (079_02)	1302
RP458	Pangashia (079_02)	135
RP458	Pangashia (079_02)	136
RP458	Pangashia (079_02)	137
RP458	Pangashia (079_02)	138
RP458	Pangashia (079_02)	140
RP461	Pangashia (079_02)	123
RP461	Pangashia (079_02)	143
RP461	Pangashia (079_02)	144
RP461	Pangashia (079_02)	148
RP461	Pangashia (079_02)	149
RP461	Pangashia (079_02)	150
RP461	Pangashia (079_02)	161
RP462	Kashtagar (091_00)	165
RP462	Kashtagar (091_00)	171
RP466	Char Lakshimi (305_00)	26
RP466	Char Lakshimi (305_00)	27
RP466	Char Lakshimi (305_00)	28
RP467	Char Lakshimi (305_00)	134
RP467	Char Lakshimi (305_00)	163
RP472	Char Lakshimi (305_00)	76
RP472	Char Lakshimi (305_00)	77
RP473	Char Lakshimi (305_00)	79
RP474	Char Lakshimi (305_00)	101

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP474	Dari Char Lakshimipur (421_02)	101
RP474	Dari Char Lakshimipur (421_02)	105
RP474	Dari Char Lakshimipur (421_02)	1080
RP474	Char Lakshimi (305_00)	3
RP474	Char Lakshimi (305_00)	390
RP474	Char Lakshimi (305_00)	4
RP474	Char Lakshimi (305_00)	64
RP474	Char Lakshimi (305_00)	65
RP475	Dakshin Thengamara (081_00)	235
RP479	Dakshin Thengamara (081_00)	274
RP479	Dakshin Thengamara (081_00)	278
RP479	Dakshin Thengamara (081_00)	279
RP48	Rajdi (078_02)	1061
RP48	Rajdi (078_02)	1062
RP48	Rajdi (078_02)	1063
RP483	Rajdi (078_02)	1055
RP483	Rajdi (078_02)	1066
RP483	Rajdi (078_02)	1089
RP483	Rajdi (078_02)	1090
RP483	Pangashia (079_02)	1171
RP483	Pangashia (079_02)	1295
RP483	Pangashia (079_02)	1310
RP483	Pangashia (079_02)	1311
RP483	Rajdi (078_02)	1378
RP483	Rajdi (078_02)	1391
RP483	Rajdi (078_02)	1392
RP483	Pangashia (079_02)	1415
RP483	Pangashia (079_02)	1416
RP483	Pangashia (079_02)	1417
RP483	Pangashia (079_02)	1418
RP483	Pangashia (079_02)	1419
RP483	Pangashia (079_02)	1420
RP483	Pangashia (079_02)	1421
RP483	Pangashia (079_02)	1422
RP483	Pangashia (079_02)	1423
RP483	Pangashia (079_02)	1424
RP483	Pangashia (079_02)	1425
RP483	Rajdi (078_02)	1437
RP483	Rajdi (078_02)	1438
RP483	Rajdi (078_02)	1487
RP483	Rajdi (078_02)	1488
RP483	Mazidbari (042_00)	217
RP483	Mazidbari (042_00)	218
RP483	Mazidbari (042_00)	221
RP483	Mazidbari (042_00)	230
RP483	Mazidbari (042_00)	231
RP483	Dakshin Thengamara (081_00)	249
RP483	Dakshin Thengamara (081_00)	250
RP483	Pangashia (079_02)	276
RP483	Pangashia (079_02)	278
RP483	Pangashia (079_02)	279
RP483	Pangashia (079_02)	280
RP483	Pangashia (079_02)	281

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP483	Pangashia (079_02)	282
RP483	Pangashia (079_02)	283
RP483	Pangashia (079_02)	284
RP483	Dakshin Thengamara (081_00)	540
RP483	Mazidbari (042_00)	86
RP484	Dakshin Thengamara (081_00)	1
RP484	Dakshin Thengamara (081_00)	118
RP484	Dakshin Thengamara (081_00)	119
RP484	Pangashia (079_02)	1413
RP484	Pangashia (079_02)	189
RP484	Pangashia (079_02)	190
RP484	Pangashia (079_02)	193
RP484	Pangashia (079_02)	206
RP484	Pangashia (079_02)	210
RP484	Pangashia (079_02)	211
RP484	Pangashia (079_02)	212
RP484	Dakshin Thengamara (081_00)	220
RP484	Dakshin Thengamara (081_00)	221
RP484	Dakshin Thengamara (081_00)	223
RP484	Dakshin Thengamara (081_00)	224
RP484	Dakshin Thengamara (081_00)	225
RP484	Dakshin Thengamara (081_00)	228
RP484	Dakshin Thengamara (081_00)	231
RP484	Dakshin Thengamara (081_00)	236
RP484	Dakshin Thengamara (081_00)	238
RP484	Dakshin Thengamara (081_00)	239
RP484	Dakshin Thengamara (081_00)	240
RP484	Dakshin Thengamara (081_00)	242
RP484	Dakshin Thengamara (081_00)	246
RP484	Dakshin Thengamara (081_00)	248
RP484	Dakshin Thengamara (081_00)	257
RP484	Pangashia (079_02)	257
RP484	Dakshin Thengamara (081_00)	258
RP484	Dakshin Thengamara (081_00)	260
RP484	Pangashia (079_02)	261
RP484	Pangashia (079_02)	262
RP484	Pangashia (079_02)	266
RP484	Pangashia (079_02)	267
RP484	Pangashia (079_02)	269
RP484	Pangashia (079_02)	273
RP484	Pangashia (079_02)	274
RP484	Pangashia (079_02)	275
RP489	Char Fathebahadurpur (424_04)	2632
RP489	Char Fathebahadurpur (424_04)	2638
RP489	Char Fathebahadurpur (424_04)	2639
RP489	Char Fathebahadurpur (424_04)	2641
RP489	Char Fathebahadurpur (424_04)	3186
RP489	Char Fathebahadurpur (424_04)	3187
RP489	Char Fathebahadurpur (424_04)	3192
RP489	Char Fathebahadurpur (424_04)	3193
RP489	Char Fathebahadurpur (424_04)	3200
RP489	Char Fathebahadurpur (424_04)	3201
RP489	Char Fathebahadurpur (424_04)	3202

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP489	Char Fathebahadurpur (424_04)	3203
RP489	Char Fathebahadurpur (424_04)	3213
RP489	Char Fathebahadurpur (424_04)	3214
RP489	Char Fathebahadurpur (424_04)	3225
RP489	Char Fathebahadurpur (424_04)	3247
RP489	Char Fathebahadurpur (424_04)	3251
RP489	Char Fathebahadurpur (424_04)	3277
RP489	Char Fathebahadurpur (424_04)	3290
RP489	Char Fathebahadurpur (424_04)	3291
RP489	Char Fathebahadurpur (424_04)	3305
RP489	Char Fathebahadurpur (424_04)	3306
RP489	Char Fathebahadurpur (424_04)	3314
RP489	Char Fathebahadurpur (424_04)	3315
RP489	Char Fathebahadurpur (424_04)	3328
RP489	Char Fathebahadurpur (424_04)	3329
RP489	Char Fathebahadurpur (424_04)	3339
RP489	Char Fathebahadurpur (424_04)	3340
RP489	Char Fathebahadurpur (424_04)	3352
RP489	Char Fathebahadurpur (424_04)	3378
RP489	Char Fathebahadurpur (424_04)	3390
RP491	Lakhimpur Pakhara (092_00)	966
RP491	Lakhimpur Pakhara (092_00)	968
RP491	Lakhimpur Pakhara (092_00)	969
RP491	Lakhimpur Pakhara (092_00)	970
RP491	Lakhimpur Pakhara (092_00)	971
RP492	Bibhagdi (422_02)	409
RP494	Bibhagdi (422_02)	105
RP495	Bibhagdi (422_02)	1
RP495	UttarThengamara (082_00)	1
RP495	UttarThengamara (082_00)	117
RP495	UttarThengamara (082_00)	20
RP496	Bibhagdi (422_02)	172
RP496	Bibhagdi (422_02)	173
RP498	Bibhagdi (422_02)	211
RP498	Bibhagdi (422_02)	212
RP500	UttarThengamara (082_00)	138
RP500	UttarThengamara (082_00)	139
RP501	Pangashia (079_02)	757
RP501	Pangashia (079_02)	758
RP505	Pangashia (079_02)	824
RP505	Pangashia (079_02)	827
RP506	Bibhagdi (422_02)	1
RP506	UttarThengamara (082_00)	1
RP506	Bibhagdi (422_02)	100
RP506	Bibhagdi (422_02)	102
RP506	Bibhagdi (422_02)	104
RP506	UttarThengamara (082_00)	117
RP506	Pangashia (079_01)	385
RP506	Pangashia (079_01)	386
RP506	Pangashia (079_01)	387
RP506	Bibhagdi (422_02)	409
RP506	Pangashia (079_01)	618
RP506	Pangashia (079_01)	621

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP506	Pangashia (079_01)	622
RP506	Pangashia (079_01)	623
RP506	Pangashia (079_01)	624
RP506	Pangashia (079_01)	625
RP506	Pangashia (079_01)	626
RP506	Pangashia (079_01)	646
RP506	Pangashia (079_01)	649
RP506	Pangashia (079_01)	650
RP506	Pangashia (079_01)	660
RP506	Pangashia (079_01)	661
RP506	Pangashia (079_02)	713
RP506	Pangashia (079_02)	714
RP506	Pangashia (079_02)	717
RP506	Pangashia (079_02)	718
RP506	Pangashia (079_02)	719
RP506	Pangashia (079_02)	735
RP506	Pangashia (079_02)	757
RP506	Bibhagdi (422_02)	84
RP506	Bibhagdi (422_02)	87
RP506	Bibhagdi (422_02)	98
RP506	Bibhagdi (422_02)	99
RP509	Pangashia (079_02)	819
RP509	Pangashia (079_02)	842
RP509	Pangashia (079_02)	843
RP51	Rajdi (078_02)	1028
RP51	Rajdi (078_02)	1029
RP51	Rajdi (078_02)	1030
RP51	Rajdi (078_02)	1031
RP512	Pangashia (079_02)	1
RP512	Pangashia (079_02)	1313
RP512	Pangashia (079_02)	1314
RP512	Pangashia (079_02)	1315
RP512	Pangashia (079_02)	1317
RP512	Pangashia (079_02)	1322
RP512	Pangashia (079_02)	1325
RP512	Pangashia (079_02)	1328
RP512	Pangashia (079_02)	1330
RP512	Pangashia (079_02)	1332
RP512	Pangashia (079_02)	1333
RP512	Pangashia (079_02)	1334
RP512	Pangashia (079_02)	1361
RP512	Pangashia (079_02)	1364
RP512	Pangashia (079_02)	1375
RP512	Pangashia (079_02)	1376
RP512	Pangashia (079_02)	1384
RP512	Pangashia (079_02)	1387
RP512	Pangashia (079_02)	1396
RP512	Pangashia (079_02)	1397
RP512	Pangashia (079_02)	1398
RP512	Pangashia (079_02)	1399
RP512	Pangashia (079_02)	1405
RP512	Pangashia (079_02)	1407
RP512	Pangashia (079_02)	1408

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP512	Pangashia (079_02)	141
RP512	Pangashia (079_02)	146
RP512	Pangashia (079_02)	187
RP512	Pangashia (079_02)	278
RP512	Pangashia (079_02)	32
RP512	Pangashia (079_02)	33
RP512	Pangashia (079_02)	47
RP512	Pangashia (079_02)	49
RP512	Pangashia (079_02)	50
RP512	Pangashia (079_02)	710
RP512	Pangashia (079_02)	714
RP512	Pangashia (079_02)	717
RP512	Pangashia (079_02)	718
RP512	Pangashia (079_02)	719
RP512	Pangashia (079_02)	732
RP512	Pangashia (079_02)	733
RP512	Pangashia (079_02)	735
RP512	Pangashia (079_02)	760
RP512	Pangashia (079_02)	827
RP512	Pangashia (079_02)	831
RP512	Pangashia (079_02)	837
RP512	Pangashia (079_02)	838
RP512	Pangashia (079_02)	839
RP512	Pangashia (079_02)	840
RP512	Pangashia (079_02)	844
RP512	Pangashia (079_02)	845
RP512	Pangashia (079_02)	846
RP512	Pangashia (079_02)	849
RP512	Pangashia (079_02)	850
RP512	Pangashia (079_02)	851
RP512	Pangashia (079_02)	854
RP512	Pangashia (079_02)	855
RP512	Pangashia (079_02)	860
RP512	Pangashia (079_02)	861
RP512	Pangashia (079_02)	865
RP512	Pangashia (079_02)	866
RP512	Pangashia (079_02)	867
RP512	Pangashia (079_02)	870
RP514	Char Lakshimi (305_00)	203
RP514	Char Lakshimi (305_00)	220
RP515	Char Lakshimi (305_00)	219
RP515	Char Lakshimi (305_00)	229
RP515	Char Lakshimi (305_00)	230
RP515	Char Lakshimi (305_00)	231
RP515	Char Lakshimi (305_00)	233
RP516	Pangashia (079_02)	238
RP517	Dakshin Thengamara (081_00)	3
RP519	UttarThengamara (082_00)	188
RP519	Dakshin Thengamara (081_00)	7
RP519	Dakshin Thengamara (081_00)	8
RP519	UttarThengamara (082_00)	89
RP519	Dakshin Thengamara (081_00)	9
RP519	UttarThengamara (082_00)	90

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP520	Pangashia (079_02)	1407
RP520	Pangashia (079_02)	1408
RP520	Pangashia (079_02)	1409
RP523	Pangashia (079_02)	1053
RP523	Pangashia (079_02)	1055
RP523	Pangashia (079_02)	1056
RP523	Pangashia (079_02)	1057
RP523	Pangashia (079_02)	1100
RP523	Pangashia (079_02)	1104
RP523	Pangashia (079_02)	1105
RP523	Pangashia (079_02)	1106
RP523	Pangashia (079_02)	1107
RP523	Pangashia (079_02)	1138
RP523	Pangashia (079_02)	1143
RP523	Pangashia (079_02)	1144
RP523	Pangashia (079_02)	1182
RP523	Pangashia (079_02)	1183
RP523	Pangashia (079_02)	1184
RP523	Pangashia (079_02)	1227
RP523	Pangashia (079_02)	1336
RP523	Pangashia (079_02)	1343
RP523	Pangashia (079_02)	1344
RP523	Pangashia (079_02)	1345
RP523	Pangashia (079_02)	1348
RP525	Char Krishnanagar (295_00)	179
RP525	Char Krishnanagar (295_00)	181
RP526	Char Krishnanagar (295_00)	1
RP526	Rajdi (078_01)	218
RP526	Rajdi (078_01)	223
RP526	Rajdi (078_01)	224
RP526	Rajdi (078_01)	225
RP526	Rajdi (078_01)	226
RP526	Rajdi (078_01)	227
RP526	Rajdi (078_01)	228
RP526	Rajdi (078_01)	239
RP526	Rajdi (078_01)	240
RP526	Rajdi (078_01)	241
RP526	Lamchari (298_02)	537
RP526	Lamchari (298_02)	538
RP526	Lamchari (298_02)	539
RP526	Lamchari (298_02)	540
RP526	Lamchari (298_02)	542
RP526	Lamchari (298_02)	543
RP526	Lamchari (298_02)	544
RP526	Lamchari (298_02)	546
RP526	Lamchari (298_02)	547
RP526	Lamchari (298_02)	550
RP526	Lamchari (298_02)	551
RP526	Lamchari (298_02)	553
RP526	Lamchari (298_02)	554
RP526	Lamchari (298_02)	661
RP526	Lamchari (298_02)	662
RP526	Lamchari (298_02)	663

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP527	Rajdi (078_01)	174
RP527	Rajdi (078_01)	237
RP528	Rajdi (078_01)	197
RP528	Rajdi (078_01)	198
RP528	Rajdi (078_01)	244
RP529	Rajdi (078_01)	25
RP529	Rajdi (078_01)	26
RP529	Rajdi (078_01)	27
RP529	Rajdi (078_01)	28
RP53	Rajdi (078_02)	1053
RP53	Rajdi (078_02)	1055
RP53	Rajdi (078_02)	1056
RP530	Rajdi (078_01)	152
RP530	Rajdi (078_01)	153
RP530	Rajdi (078_01)	154
RP532	Pangashia (079_01)	18
RP533	Pangashia (079_01)	14
RP533	Pangashia (079_01)	6
RP533	Pangashia (079_01)	7
RP534	Pangashia (079_01)	22
RP538	Pangashia (079_01)	60
RP538	Pangashia (079_01)	61
RP539	Pangashia (079_01)	64
RP539	Pangashia (079_01)	65
RP541	Pangashia (079_01)	32
RP541	Pangashia (079_01)	35
RP545	Pangashia (079_01)	240
RP545	Pangashia (079_01)	243
RP545	Pangashia (079_01)	244
RP546	Pangashia (079_01)	236
RP547	Pangashia (079_01)	261
RP548	Pangashia (079_01)	300
RP549	Pangashia (079_01)	314
RP550	Pangashia (079_01)	316
RP550	Pangashia (079_01)	317
RP554	Pangashia (079_02)	1014
RP554	Pangashia (079_02)	1031
RP554	Pangashia (079_02)	1032
RP554	Pangashia (079_02)	1034
RP555	Pangashia (079_02)	1019
RP555	Pangashia (079_02)	1020
RP555	Pangashia (079_02)	1021
RP555	Pangashia (079_02)	1022
RP555	Pangashia (079_02)	1023
RP555	Pangashia (079_02)	1026
RP555	Pangashia (079_02)	1030
RP555	Pangashia (079_02)	1031
RP556	Pangashia (079_01)	232
RP558	Pangashia (079_01)	292
RP558	Pangashia (079_01)	294
RP559	Pangashia (079_01)	292
RP559	Pangashia (079_01)	293
RP56	Rajdi (078_02)	1077



<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP56	Rajdi (078_02)	1078
RP56	Rajdi (078_02)	1081
RP56	Rajdi (078_02)	1082
RP560	Pangashia (079_02)	1034
RP562	Pangashia (079_02)	1055
RP562	Pangashia (079_02)	1059
RP563	Pangashia (079_01)	112
RP563	Pangashia (079_01)	116
RP563	Pangashia (079_01)	117
RP563	Pangashia (079_01)	79
RP563	Pangashia (079_01)	82
RP563	Pangashia (079_01)	83
RP563	Pangashia (079_01)	84
RP563	Pangashia (079_01)	85
RP564	Pangashia (079_01)	110
RP564	Pangashia (079_01)	112
RP564	Pangashia (079_01)	113
RP564	Pangashia (079_01)	116
RP564	Pangashia (079_01)	117
RP564	Pangashia (079_01)	121
RP568	Purbba Minajdi (068_00)	131
RP568	Purbba Minajdi (068_00)	132
RP568	Purbba Minajdi (068_00)	151
RP568	Purbba Minajdi (068_00)	172
RP568	Purbba Minajdi (068_00)	173
RP568	Purbba Minajdi (068_00)	184
RP568	Purbba Minajdi (068_00)	185
RP568	Purbba Minajdi (068_00)	221
RP568	Purbba Minajdi (068_00)	222
RP568	Purbba Minajdi (068_00)	236
RP568	Purbba Minajdi (068_00)	265
RP57	Rajdi (078_02)	1102
RP57	Rajdi (078_02)	1104
RP57	Rajdi (078_02)	1106
RP571	Dakshin Janardandi (067_01)	1
RP571	Purbba Minajdi (068_00)	214
RP571	Purbba Minajdi (068_00)	218
RP571	Paschim Minajdi (066_01)	261
RP571	Paschim Minajdi (066_01)	263
RP572	Purbba Minajdi (068_00)	212
RP572	Purbba Minajdi (068_00)	214
RP572	Purbba Minajdi (068_00)	215
RP578	Purbba Minajdi (068_00)	182
RP578	Purbba Minajdi (068_00)	188
RP579	Purbba Minajdi (068_00)	184
RP579	Purbba Minajdi (068_00)	263
RP580	Purbba Minajdi (068_00)	156
RP582	Purbba Minajdi (068_00)	143
RP584	Dakshin Janardandi (067_01)	26
RP588	Char Krishnanagar (295_00)	499
RP588	Char Krishnanagar (295_00)	500
RP589	Char Krishnanagar (295_00)	509
RP590	Char Krishnanagar (295_00)	511

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP590	Char Krishnanagar (295_00)	527
RP590	Char Krishnanagar (295_00)	528
RP590	Char Krishnanagar (295_00)	529
RP590	Char Krishnanagar (295_00)	683
RP592	Char Krishnanagar (295_00)	541
RP593	Char Krishnanagar (295_00)	542
RP593	Char Krishnanagar (295_00)	543
RP594	Char Krishnanagar (295_00)	523
RP594	Char Krishnanagar (295_00)	524
RP595	Char Krishnanagar (295_00)	617
RP595	Char Krishnanagar (295_00)	618
RP597	Char Sadipur (304_00)	489
RP598	Lamchari (298_02)	490
RP598	Char Sadipur (304_00)	497
RP598	Char Sadipur (304_00)	515
RP598	Lamchari (298_02)	515
RP598	Lamchari (298_02)	642
RP6	Rajdi (078_01)	736
RP6	Rajdi (078_01)	737
RP6	Rajdi (078_01)	740
RP6	Rajdi (078_01)	741
RP6	Rajdi (078_01)	819
RP60	Rajdi (078_02)	1072
RP60	Rajdi (078_02)	1073
RP60	Rajdi (078_02)	1074
RP60	Rajdi (078_02)	1075
RP60	Rajdi (078_02)	1077
RP602	Dakshin Gopalpur (044_00)	324
RP602	Dakshin Gopalpur (044_00)	325
RP603	Dakshin Gopalpur (044_00)	324
RP604	Dakshin Gopalpur (044_00)	341
RP605	Rajdi (078_01)	491
RP605	Rajdi (078_01)	492
RP605	Rajdi (078_01)	494
RP605	Rajdi (078_01)	497
RP605	Rajdi (078_01)	663
RP605	Rajdi (078_01)	664
RP607	Rajdi (078_01)	584
RP61	Rajdi (078_02)	1019
RP61	Rajdi (078_02)	1020
RP61	Rajdi (078_02)	1021
RP612	Rajdi (078_01)	677
RP612	Rajdi (078_01)	678
RP615	Jhautala (086_00)	115
RP615	Jhautala (086_00)	88
RP618	Pangashia (079_01)	22
RP618	Jhautala (086_00)	58
RP619	Pangashia (079_01)	23
RP619	Pangashia (079_01)	93
RP621	Pangashia (079_01)	102
RP621	Pangashia (079_01)	95
RP621	Pangashia (079_01)	96
RP621	Pangashia (079_01)	99

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP622	Jhautala (086_00)	66
RP622	Jhautala (086_00)	72
RP622	Jhautala (086_00)	73
RP622	Jhautala (086_00)	74
RP622	Jhautala (086_00)	75
RP622	Jhautala (086_00)	78
RP622	Pangashia (079_01)	99
RP623	Jhautala (086_00)	58
RP623	Jhautala (086_00)	68
RP624	Jhautala (086_00)	59
RP624	Jhautala (086_00)	60
RP626	Badardi (074_00)	40
RP627	Badardi (074_00)	41
RP628	Badardi (074_00)	41
RP629	Badardi (074_00)	139
RP63	Rajdi (078_02)	1001
RP63	Rajdi (078_02)	1008
RP63	Rajdi (078_02)	1009
RP63	Rajdi (078_02)	1010
RP630	Badardi (074_00)	132
RP630	Badardi (074_00)	133
RP632	Dakshin Janardandi (067_02)	842
RP633	Dakshin Janardandi (067_02)	831
RP636	Dakshin Janardandi (067_02)	810
RP636	Dakshin Janardandi (067_02)	811
RP636	Dakshin Janardandi (067_02)	812
RP636	Dakshin Janardandi (067_02)	821
RP636	Dakshin Janardandi (067_02)	927
RP637	Dakshin Janardandi (067_02)	894
RP639	Dakshin Janardandi (067_02)	893
RP640	Kashimpur 075_00	230
RP641	Badardi (074_00)	128
RP641	Badardi (074_00)	130
RP641	Badardi (074_00)	131
RP641	Badardi (074_00)	134
RP641	Badardi (074_00)	139
RP641	Badardi (074_00)	146
RP641	Badardi (074_00)	147
RP641	Badardi (074_00)	148
RP641	Badardi (074_00)	152
RP641	Uttar Janardandi (070_00)	155
RP641	Uttar Janardandi (070_00)	156
RP641	Badardi (074_00)	39
RP641	Badardi (074_00)	40
RP641	Badardi (074_00)	41
RP641	Badardi (074_00)	42
RP641	Badardi (074_00)	50
RP641	Badardi (074_00)	83
RP641	Badardi (074_00)	84
RP641	Dakshin Janardandi (067_02)	845
RP641	Dakshin Janardandi (067_02)	846
RP641	Dakshin Janardandi (067_02)	849
RP641	Dakshin Janardandi (067_02)	868

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP641	Dakshin Janardandi (067_02)	869
RP641	Dakshin Janardandi (067_02)	870
RP641	Dakshin Janardandi (067_02)	879
RP641	Dakshin Janardandi (067_02)	892
RP641	Badardi (074_00)	90
RP641	Dakshin Janardandi (067_02)	925
RP642	Dakshin Janardandi (067_02)	825
RP642	Dakshin Janardandi (067_02)	834
RP642	Dakshin Janardandi (067_02)	835
RP642	Dakshin Janardandi (067_02)	836
RP643	Kashimpur 075_00	276
RP645	Kashimpur 075_00	238
RP646	Badardi (074_00)	139
RP65	Rajdi (078_02)	1001
RP652	Bibhagdi (422_02)	1
RP652	UttarThengamara (082_00)	1
RP652	UttarThengamara (082_00)	117
RP652	UttarThengamara (082_00)	122
RP652	UttarThengamara (082_00)	135
RP652	UttarThengamara (082_00)	140
RP652	UttarThengamara (082_00)	141
RP652	Dakshin Thengamara (081_00)	21
RP652	Dakshin Thengamara (081_00)	22
RP652	Bibhagdi (422_02)	220
RP652	Bibhagdi (422_02)	248
RP652	Bibhagdi (422_02)	257
RP652	Bibhagdi (422_02)	276
RP652	Dakshin Thengamara (081_00)	281
RP652	Dakshin Thengamara (081_00)	32
RP652	Dakshin Thengamara (081_00)	33
RP652	UttarThengamara (082_00)	33
RP652	Dakshin Thengamara (081_00)	38
RP652	Bibhagdi (422_02)	381
RP652	Bibhagdi (422_02)	383
RP652	Bibhagdi (422_02)	384
RP652	UttarThengamara (082_00)	40
RP652	Dakshin Thengamara (081_00)	41
RP654	Bibhagdi (422_02)	1633
RP654	Bibhagdi (422_02)	1988
RP655	Bibhagdi (422_02)	1625
RP655	Bibhagdi (422_02)	1915
RP66	Paschim Minajdi (066_02)	875
RP66	Paschim Minajdi (066_02)	877
RP660	Char Fathebahadurpur (424_05)	4259
RP662	Char Fathebahadurpur (424_05)	4432
RP663	Char Pangashia (293_00)	1
RP663	Bibhagdi (422_02)	10
RP663	Lakhimpur Pakhara (092_00)	1015
RP663	Lakhimpur Pakhara (092_00)	1033
RP663	Lakhimpur Pakhara (092_00)	1036
RP663	Lakhimpur Pakhara (092_00)	1037
RP663	Lakhimpur Pakhara (092_00)	1038
RP663	Lakhimpur Pakhara (092_00)	1070

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP663	Lakhimpur Pakhara (092_00)	1071
RP663	Dari Char Lakshimpur (421_02)	1080
RP663	Char Pangashia (293_00)	11
RP663	Char Bibhagdi (294_00)	110
RP663	Lakhimpur Pakhara (092_00)	117
RP663	Bibhagdi (422_02)	12
RP663	Char Pangashia (293_00)	12
RP663	Lakhimpur Pakhara (092_00)	122
RP663	Lakhimpur Pakhara (092_00)	126
RP663	Dari Char Lakshimpur (421_02)	1269
RP663	Lakhimpur Pakhara (092_00)	127
RP663	Dari Char Lakshimpur (421_02)	1270
RP663	Dari Char Lakshimpur (421_02)	1271
RP663	Dari Char Lakshimpur (421_02)	1272
RP663	Dari Char Lakshimpur (421_02)	1273
RP663	Dari Char Lakshimpur (421_02)	1274
RP663	Lakhimpur Pakhara (092_00)	128
RP663	Bibhagdi (422_02)	13
RP663	Char Pangashia (293_00)	13
RP663	Bibhagdi (422_02)	14
RP663	Char Pangashia (293_00)	14
RP663	Bibhagdi (422_02)	1503
RP663	Bibhagdi (422_02)	1504
RP663	Bibhagdi (422_02)	1510
RP663	Bibhagdi (422_02)	1511
RP663	Bibhagdi (422_02)	1514
RP663	Bibhagdi (422_02)	1515
RP663	Bibhagdi (422_02)	1517
RP663	Bibhagdi (422_02)	1518
RP663	Bibhagdi (422_02)	1519
RP663	Bibhagdi (422_02)	1520
RP663	Bibhagdi (422_02)	1521
RP663	Bibhagdi (422_02)	1522
RP663	Bibhagdi (422_02)	1523
RP663	Bibhagdi (422_02)	1524
RP663	Bibhagdi (422_02)	1525
RP663	Bibhagdi (422_02)	1526
RP663	Bibhagdi (422_02)	1532
RP663	Bibhagdi (422_02)	1533
RP663	Bibhagdi (422_02)	1534
RP663	Bibhagdi (422_02)	1535
RP663	Bibhagdi (422_02)	1536
RP663	Bibhagdi (422_02)	1537
RP663	Bibhagdi (422_02)	1538
RP663	Bibhagdi (422_02)	1539
RP663	Bibhagdi (422_02)	1541
RP663	Bibhagdi (422_02)	1542
RP663	Bibhagdi (422_02)	1543
RP663	Bibhagdi (422_02)	1544
RP663	Bibhagdi (422_02)	1545
RP663	Bibhagdi (422_02)	1546
RP663	Bibhagdi (422_02)	1547
RP663	Bibhagdi (422_02)	1548

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP663	Bibhagdi (422_02)	1549
RP663	Bibhagdi (422_02)	1550
RP663	Bibhagdi (422_02)	1551
RP663	Bibhagdi (422_02)	1552
RP663	Bibhagdi (422_02)	1553
RP663	Bibhagdi (422_02)	1554
RP663	Bibhagdi (422_02)	1555
RP663	Bibhagdi (422_02)	1556
RP663	Bibhagdi (422_02)	1557
RP663	Bibhagdi (422_02)	1558
RP663	Bibhagdi (422_02)	1559
RP663	Bibhagdi (422_02)	1560
RP663	Bibhagdi (422_02)	1561
RP663	Bibhagdi (422_02)	1562
RP663	Bibhagdi (422_02)	1563
RP663	Bibhagdi (422_02)	1566
RP663	Bibhagdi (422_02)	1567
RP663	Bibhagdi (422_02)	1568
RP663	Bibhagdi (422_02)	1569
RP663	Bibhagdi (422_02)	1570
RP663	Bibhagdi (422_02)	1571
RP663	Bibhagdi (422_02)	1572
RP663	Bibhagdi (422_02)	1573
RP663	Bibhagdi (422_02)	1574
RP663	Bibhagdi (422_02)	1575
RP663	Bibhagdi (422_02)	1576
RP663	Bibhagdi (422_02)	1577
RP663	Bibhagdi (422_02)	1578
RP663	Bibhagdi (422_02)	1579
RP663	Bibhagdi (422_02)	1580
RP663	Bibhagdi (422_02)	1581
RP663	Bibhagdi (422_02)	1582
RP663	Bibhagdi (422_02)	1583
RP663	Bibhagdi (422_02)	1584
RP663	Bibhagdi (422_02)	1585
RP663	Bibhagdi (422_02)	1586
RP663	Bibhagdi (422_02)	1587
RP663	Bibhagdi (422_02)	1588
RP663	Bibhagdi (422_02)	1589
RP663	Bibhagdi (422_02)	1590
RP663	Bibhagdi (422_02)	1591
RP663	Bibhagdi (422_02)	1592
RP663	Bibhagdi (422_02)	1593
RP663	Bibhagdi (422_02)	1594
RP663	Bibhagdi (422_02)	1596
RP663	Bibhagdi (422_02)	1597
RP663	Bibhagdi (422_02)	1598
RP663	Bibhagdi (422_02)	1599
RP663	Bibhagdi (422_02)	1600
RP663	Bibhagdi (422_02)	1601
RP663	Bibhagdi (422_02)	1602
RP663	Bibhagdi (422_02)	1608
RP663	Bibhagdi (422_02)	1610

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP663	Bibhagdi (422_02)	1611
RP663	Bibhagdi (422_02)	1612
RP663	Bibhagdi (422_02)	1613
RP663	Bibhagdi (422_02)	1614
RP663	Bibhagdi (422_02)	1615
RP663	Bibhagdi (422_02)	1616
RP663	Bibhagdi (422_02)	1617
RP663	Bibhagdi (422_02)	1618
RP663	Bibhagdi (422_02)	1619
RP663	Bibhagdi (422_02)	1620
RP663	Bibhagdi (422_02)	1621
RP663	Bibhagdi (422_02)	1622
RP663	Bibhagdi (422_02)	1623
RP663	Bibhagdi (422_02)	1624
RP663	Bibhagdi (422_02)	1626
RP663	Bibhagdi (422_02)	1627
RP663	Bibhagdi (422_02)	1628
RP663	Bibhagdi (422_02)	1634
RP663	Bibhagdi (422_02)	1635
RP663	Bibhagdi (422_02)	1636
RP663	Char Bibhagdi (294_00)	168
RP663	Char Bibhagdi (294_00)	169
RP663	Bibhagdi (422_02)	17
RP663	Char Bibhagdi (294_00)	176
RP663	Char Bibhagdi (294_00)	177
RP663	Char Bibhagdi (294_00)	178
RP663	Char Bibhagdi (294_00)	179
RP663	Char Bibhagdi (294_00)	180
RP663	Char Bibhagdi (294_00)	181
RP663	Char Bibhagdi (294_00)	182
RP663	Char Bibhagdi (294_00)	183
RP663	Char Bibhagdi (294_00)	184
RP663	Char Bibhagdi (294_00)	188
RP663	Char Bibhagdi (294_00)	189
RP663	Bibhagdi (422_02)	19
RP663	Bibhagdi (422_01)	193
RP663	Bibhagdi (422_01)	194
RP663	Bibhagdi (422_02)	1944
RP663	Bibhagdi (422_01)	195
RP663	Bibhagdi (422_01)	196
RP663	Bibhagdi (422_01)	197
RP663	Bibhagdi (422_02)	1971
RP663	Bibhagdi (422_02)	1973
RP663	Bibhagdi (422_02)	1976
RP663	Bibhagdi (422_02)	1977
RP663	Bibhagdi (422_01)	198
RP663	Bibhagdi (422_01)	199
RP663	Char Pangashia (293_00)	2
RP663	Bibhagdi (422_01)	200
RP663	Char Bibhagdi (294_00)	200
RP663	Bibhagdi (422_01)	201
RP663	Char Bibhagdi (294_00)	202
RP663	Bibhagdi (422_01)	203

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP663	Bibhagdi (422_01)	204
RP663	Bibhagdi (422_01)	205
RP663	Bibhagdi (422_01)	206
RP663	Shicarmangal (423_01)	206
RP663	Bibhagdi (422_01)	207
RP663	Shicarmangal (423_01)	207
RP663	Bibhagdi (422_01)	208
RP663	Shicarmangal (423_01)	208
RP663	Bibhagdi (422_01)	209
RP663	Shicarmangal (423_01)	209
RP663	Bibhagdi (422_01)	210
RP663	Bibhagdi (422_01)	211
RP663	Shicarmangal (423_01)	211
RP663	Bibhagdi (422_01)	212
RP663	Bibhagdi (422_02)	212
RP663	Bibhagdi (422_01)	213
RP663	Bibhagdi (422_02)	213
RP663	Shicarmangal (423_01)	213
RP663	Bibhagdi (422_01)	214
RP663	Bibhagdi (422_02)	214
RP663	Shicarmangal (423_01)	215
RP663	Bibhagdi (422_01)	216
RP663	Bibhagdi (422_01)	217
RP663	Bibhagdi (422_02)	22
RP663	Bibhagdi (422_01)	220
RP663	Bibhagdi (422_01)	221
RP663	Bibhagdi (422_01)	223
RP663	Bibhagdi (422_01)	224
RP663	Bibhagdi (422_01)	227
RP663	Bibhagdi (422_01)	228
RP663	Bibhagdi (422_01)	229
RP663	Bibhagdi (422_02)	23
RP663	Bibhagdi (422_01)	230
RP663	Bibhagdi (422_01)	232
RP663	Bibhagdi (422_02)	24
RP663	Bibhagdi (422_01)	248
RP663	Bibhagdi (422_02)	25
RP663	Char Fathebahadurpur (424_04)	2552
RP663	Char Fathebahadurpur (424_04)	2553
RP663	Char Fathebahadurpur (424_04)	2554
RP663	Char Fathebahadurpur (424_04)	2555
RP663	Char Fathebahadurpur (424_04)	2562
RP663	Char Fathebahadurpur (424_04)	2564
RP663	Char Fathebahadurpur (424_04)	2565
RP663	Char Fathebahadurpur (424_04)	2566
RP663	Char Fathebahadurpur (424_04)	2570
RP663	Char Fathebahadurpur (424_04)	2571
RP663	Char Fathebahadurpur (424_04)	2572
RP663	Char Fathebahadurpur (424_04)	2573
RP663	Char Fathebahadurpur (424_04)	2575
RP663	Char Fathebahadurpur (424_04)	2576
RP663	Char Fathebahadurpur (424_04)	2577
RP663	Char Fathebahadurpur (424_04)	2578

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP663	Char Fathebahadurpur (424_04)	2581
RP663	Char Fathebahadurpur (424_04)	2582
RP663	Char Fathebahadurpur (424_04)	2583
RP663	Char Fathebahadurpur (424_04)	2585
RP663	Char Fathebahadurpur (424_04)	2586
RP663	Char Fathebahadurpur (424_04)	2587
RP663	Char Fathebahadurpur (424_04)	2588
RP663	Char Fathebahadurpur (424_04)	2589
RP663	Char Fathebahadurpur (424_04)	2591
RP663	Bibhagdi (422_02)	26
RP663	Char Fathebahadurpur (424_04)	2680
RP663	Char Fathebahadurpur (424_04)	2681
RP663	Char Fathebahadurpur (424_04)	2683
RP663	Char Fathebahadurpur (424_04)	2684
RP663	Bibhagdi (422_02)	27
RP663	Bibhagdi (422_02)	28
RP663	Lakhimpur Pakhara (092_00)	288
RP663	Bibhagdi (422_02)	29
RP663	Char Fathebahadurpur (424_04)	2921
RP663	Bibhagdi (422_01)	295
RP663	Char Pangashia (293_00)	3
RP663	Lakhimpur Pakhara (092_00)	303
RP663	Lakhimpur Pakhara (092_00)	304
RP663	Lakhimpur Pakhara (092_00)	305
RP663	Lakhimpur Pakhara (092_00)	306
RP663	Lakhimpur Pakhara (092_00)	307
RP663	Lakhimpur Pakhara (092_00)	308
RP663	Lakhimpur Pakhara (092_00)	309
RP663	Bibhagdi (422_02)	31
RP663	Lakhimpur Pakhara (092_00)	315
RP663	Lakhimpur Pakhara (092_00)	316
RP663	Lakhimpur Pakhara (092_00)	317
RP663	Lakhimpur Pakhara (092_00)	319
RP663	Bibhagdi (422_02)	32
RP663	Lakhimpur Pakhara (092_00)	320
RP663	Lakhimpur Pakhara (092_00)	321
RP663	Lakhimpur Pakhara (092_00)	322
RP663	Lakhimpur Pakhara (092_00)	323
RP663	Lakhimpur Pakhara (092_00)	324
RP663	Lakhimpur Pakhara (092_00)	325
RP663	Lakhimpur Pakhara (092_00)	326
RP663	Lakhimpur Pakhara (092_00)	327
RP663	Lakhimpur Pakhara (092_00)	328
RP663	Bibhagdi (422_02)	33
RP663	Char Bibhagdi (294_00)	33
RP663	Lakhimpur Pakhara (092_00)	330
RP663	Lakhimpur Pakhara (092_00)	350
RP663	Lakhimpur Pakhara (092_00)	352
RP663	Lakhimpur Pakhara (092_00)	353
RP663	Lakhimpur Pakhara (092_00)	354
RP663	Lakhimpur Pakhara (092_00)	355
RP663	Lakhimpur Pakhara (092_00)	356
RP663	Lakhimpur Pakhara (092_00)	357

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP663	Lakhimpur Pakhara (092_00)	358
RP663	Lakhimpur Pakhara (092_00)	359
RP663	Char Bibhagdi (294_00)	36
RP663	Lakhimpur Pakhara (092_00)	360
RP663	Lakhimpur Pakhara (092_00)	361
RP663	Lakhimpur Pakhara (092_00)	362
RP663	Lakhimpur Pakhara (092_00)	363
RP663	Lakhimpur Pakhara (092_00)	364
RP663	Lakhimpur Pakhara (092_00)	365
RP663	Lakhimpur Pakhara (092_00)	366
RP663	Lakhimpur Pakhara (092_00)	367
RP663	Lakhimpur Pakhara (092_00)	368
RP663	Lakhimpur Pakhara (092_00)	369
RP663	Char Bibhagdi (294_00)	37
RP663	Lakhimpur Pakhara (092_00)	370
RP663	Lakhimpur Pakhara (092_00)	371
RP663	Char Fathebahadurpur (424_05)	3712
RP663	Lakhimpur Pakhara (092_00)	372
RP663	Char Fathebahadurpur (424_05)	3722
RP663	Lakhimpur Pakhara (092_00)	373
RP663	Char Fathebahadurpur (424_05)	3739
RP663	Char Fathebahadurpur (424_05)	3742
RP663	Char Fathebahadurpur (424_05)	3743
RP663	Char Fathebahadurpur (424_05)	3747
RP663	Char Fathebahadurpur (424_05)	3748
RP663	Lakhimpur Pakhara (092_00)	375
RP663	Char Fathebahadurpur (424_05)	3754
RP663	Char Fathebahadurpur (424_05)	3755
RP663	Char Fathebahadurpur (424_05)	3756
RP663	Char Fathebahadurpur (424_05)	3757
RP663	Lakhimpur Pakhara (092_00)	376
RP663	Char Fathebahadurpur (424_05)	3760
RP663	Char Fathebahadurpur (424_05)	3761
RP663	Char Fathebahadurpur (424_05)	3769
RP663	Lakhimpur Pakhara (092_00)	377
RP663	Char Fathebahadurpur (424_05)	3770
RP663	Char Fathebahadurpur (424_05)	3771
RP663	Char Fathebahadurpur (424_05)	3772
RP663	Char Fathebahadurpur (424_05)	3779
RP663	Char Fathebahadurpur (424_05)	3780
RP663	Char Fathebahadurpur (424_05)	3781
RP663	Char Fathebahadurpur (424_05)	3784
RP663	Char Fathebahadurpur (424_05)	3785
RP663	Char Fathebahadurpur (424_05)	3786
RP663	Char Fathebahadurpur (424_05)	3787
RP663	Char Fathebahadurpur (424_05)	3788
RP663	Char Fathebahadurpur (424_05)	3789
RP663	Char Fathebahadurpur (424_05)	3790
RP663	Char Fathebahadurpur (424_05)	3791
RP663	Char Fathebahadurpur (424_05)	3796
RP663	Char Fathebahadurpur (424_05)	3797
RP663	Char Fathebahadurpur (424_05)	3798
RP663	Char Fathebahadurpur (424_05)	3799

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP663	Char Bibhagdi (294_00)	38
RP663	Lakhimpur Pakhara (092_00)	382
RP663	Lakhimpur Pakhara (092_00)	383
RP663	Lakhimpur Pakhara (092_00)	384
RP663	Char Bibhagdi (294_00)	39
RP663	Char Pangashia (293_00)	4
RP663	Char Bibhagdi (294_00)	40
RP663	Bibhagdi (422_02)	409
RP663	Char Bibhagdi (294_00)	42
RP663	Lakhimpur Pakhara (092_00)	423
RP663	Lakhimpur Pakhara (092_00)	424
RP663	Char Bibhagdi (294_00)	43
RP663	Lakhimpur Pakhara (092_00)	432
RP663	Lakhimpur Pakhara (092_00)	433
RP663	Lakhimpur Pakhara (092_00)	434
RP663	Char Bibhagdi (294_00)	44
RP663	Char Fathebahadurpur (424_05)	4476
RP663	Char Fathebahadurpur (424_05)	4493
RP663	Char Bibhagdi (294_00)	46
RP663	Char Bibhagdi (294_00)	48
RP663	Char Krishnanagar (295_00)	48
RP663	Char Bibhagdi (294_00)	49
RP663	Char Pangashia (293_00)	5
RP663	Char Bibhagdi (294_00)	50
RP663	Char Bibhagdi (294_00)	51
RP663	Char Bibhagdi (294_00)	52
RP663	Lakhimpur Pakhara (092_00)	523
RP663	Lakhimpur Pakhara (092_00)	524
RP663	Lakhimpur Pakhara (092_00)	525
RP663	Lakhimpur Pakhara (092_00)	526
RP663	Lakhimpur Pakhara (092_00)	532
RP663	Lakhimpur Pakhara (092_00)	533
RP663	Lakhimpur Pakhara (092_00)	538
RP663	Lakhimpur Pakhara (092_00)	539
RP663	Lakhimpur Pakhara (092_00)	540
RP663	Lakhimpur Pakhara (092_00)	541
RP663	Lakhimpur Pakhara (092_00)	542
RP663	Lakhimpur Pakhara (092_00)	545
RP663	Lakhimpur Pakhara (092_00)	546
RP663	Lakhimpur Pakhara (092_00)	547
RP663	Char Bibhagdi (294_00)	55
RP663	Lakhimpur Pakhara (092_00)	550
RP663	Char Fathebahadurpur (424_05)	557
RP663	Char Bibhagdi (294_00)	56
RP663	Bibhagdi (422_02)	57
RP663	Char Bibhagdi (294_00)	57
RP663	Bibhagdi (422_02)	570
RP663	Bibhagdi (422_02)	572
RP663	Bibhagdi (422_02)	573
RP663	Bibhagdi (422_02)	574
RP663	Bibhagdi (422_02)	575
RP663	Bibhagdi (422_02)	576
RP663	Bibhagdi (422_02)	577

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP663	Char Fathebahadurpur (424_05)	577
RP663	Bibhagdi (422_02)	578
RP663	Bibhagdi (422_02)	579
RP663	Bibhagdi (422_02)	58
RP663	Char Bibhagdi (294_00)	58
RP663	Char Fathebahadurpur (424_04)	587
RP663	Char Bibhagdi (294_00)	59
RP663	Lakhimpur Pakhara (092_00)	598
RP663	Lakhimpur Pakhara (092_00)	599
RP663	Char Pangashia (293_00)	6
RP663	Char Krishnanagar (295_00)	612
RP663	Char Krishnanagar (295_00)	613
RP663	Char Krishnanagar (295_00)	614
RP663	Char Krishnanagar (295_00)	615
RP663	Char Krishnanagar (295_00)	622
RP663	Char Krishnanagar (295_00)	623
RP663	Bibhagdi (422_01)	624
RP663	Char Krishnanagar (295_00)	624
RP663	Char Krishnanagar (295_00)	692
RP663	Bibhagdi (422_02)	7
RP663	Char Pangashia (293_00)	7
RP663	Lakhimpur Pakhara (092_00)	738
RP663	Lakhimpur Pakhara (092_00)	739
RP663	Lakhimpur Pakhara (092_00)	740
RP663	Lakhimpur Pakhara (092_00)	741
RP663	Lakhimpur Pakhara (092_00)	742
RP663	Lakhimpur Pakhara (092_00)	743
RP663	Lakhimpur Pakhara (092_00)	744
RP663	Lakhimpur Pakhara (092_00)	745
RP663	Lakhimpur Pakhara (092_00)	746
RP663	Lakhimpur Pakhara (092_00)	747
RP663	Lakhimpur Pakhara (092_00)	748
RP663	Lakhimpur Pakhara (092_00)	749
RP663	Lakhimpur Pakhara (092_00)	750
RP663	Lakhimpur Pakhara (092_00)	754
RP663	Lakhimpur Pakhara (092_00)	755
RP663	Lakhimpur Pakhara (092_00)	758
RP663	Lakhimpur Pakhara (092_00)	759
RP663	Lakhimpur Pakhara (092_00)	763
RP663	Lakhimpur Pakhara (092_00)	764
RP663	Lakhimpur Pakhara (092_00)	769
RP663	Lakhimpur Pakhara (092_00)	770
RP663	Lakhimpur Pakhara (092_00)	778
RP663	Lakhimpur Pakhara (092_00)	784
RP663	Lakhimpur Pakhara (092_00)	785
RP663	Lakhimpur Pakhara (092_00)	788
RP663	Lakhimpur Pakhara (092_00)	789
RP663	Lakhimpur Pakhara (092_00)	792
RP663	Bibhagdi (422_02)	8
RP663	Char Pangashia (293_00)	8
RP663	Lakhimpur Pakhara (092_00)	807
RP663	Lakhimpur Pakhara (092_00)	825
RP663	Lakhimpur Pakhara (092_00)	827

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP663	Lakhimpur Pakhara (092_00)	830
RP663	Lakhimpur Pakhara (092_00)	831
RP663	Lakhimpur Pakhara (092_00)	832
RP663	Lakhimpur Pakhara (092_00)	833
RP663	Lakhimpur Pakhara (092_00)	834
RP663	Lakhimpur Pakhara (092_00)	835
RP663	Lakhimpur Pakhara (092_00)	836
RP663	Lakhimpur Pakhara (092_00)	837
RP663	Lakhimpur Pakhara (092_00)	838
RP663	Lakhimpur Pakhara (092_00)	839
RP663	Lakhimpur Pakhara (092_00)	840
RP663	Lakhimpur Pakhara (092_00)	843
RP663	Lakhimpur Pakhara (092_00)	844
RP663	Lakhimpur Pakhara (092_00)	846
RP663	Lakhimpur Pakhara (092_00)	855
RP663	Lakhimpur Pakhara (092_00)	856
RP663	Lakhimpur Pakhara (092_00)	857
RP663	Lakhimpur Pakhara (092_00)	858
RP663	Bibhagdi (422_02)	9
RP663	Char Lakshimi (305_00)	91
RP663	Bibhagdi (422_02)	99999
RP664	Pangashia (079_01)	119
RP664	Rajdi (078_02)	1207
RP664	Rajdi (078_02)	1209
RP664	Rajdi (078_02)	1220
RP664	Rajdi (078_02)	1221
RP664	Rajdi (078_02)	1293
RP664	Rajdi (078_02)	1294
RP664	Pangashia (079_01)	1295
RP664	Rajdi (078_02)	1295
RP664	Rajdi (078_02)	1300
RP664	Pangashia (079_01)	1301
RP664	Rajdi (078_02)	1301
RP664	Pangashia (079_01)	1302
RP664	Rajdi (078_02)	1302
RP664	Rajdi (078_02)	1303
RP664	Rajdi (078_02)	1464
RP664	Pangashia (079_01)	1465
RP664	Rajdi (078_02)	1465
RP664	Pangashia (079_01)	1466
RP664	Pangashia (079_01)	1467
RP664	Pangashia (079_01)	1468
RP664	Rajdi (078_02)	1468
RP664	Rajdi (078_02)	1469
RP664	Rajdi (078_02)	1470
RP664	Rajdi (078_02)	1471
RP664	Rajdi (078_02)	1473
RP664	Rajdi (078_02)	1474
RP664	Rajdi (078_02)	1475
RP664	Pangashia (079_01)	165
RP664	Pangashia (079_01)	167
RP664	Pangashia (079_01)	168
RP664	Pangashia (079_01)	265

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP664	Pangashia (079_01)	266
RP664	Pangashia (079_01)	267
RP664	Pangashia (079_01)	268
RP664	Pangashia (079_01)	269
RP664	Pangashia (079_01)	36
RP664	Pangashia (079_01)	39
RP664	Jhautala (086_00)	41
RP664	Pangashia (079_01)	42
RP664	Pangashia (079_01)	58
RP664	Pangashia (079_01)	66
RP664	Pangashia (079_01)	76
RP664	Rajdi (078_01)	877
RP665	Paschim Minajdi (066_01)	10
RP665	Mazidbari (042_00)	1054
RP665	Rajdi (078_02)	1055
RP665	Paschim Minajdi (066_01)	106
RP665	Paschim Minajdi (066_01)	107
RP665	Mazidbari (042_00)	175
RP665	Mazidbari (042_00)	177
RP665	Mazidbari (042_00)	178
RP665	Paschim Minajdi (066_01)	196
RP665	Paschim Minajdi (066_01)	2
RP665	Mazidbari (042_00)	215
RP665	Mazidbari (042_00)	216
RP665	Puali Madaripur (043_00)	237
RP665	Gopalpur (045_00)	290
RP665	Paschim Minajdi (066_01)	339
RP665	Paschim Minajdi (066_01)	355
RP665	Paschim Minajdi (066_01)	434
RP665	Paschim Minajdi (066_01)	435
RP665	Paschim Minajdi (066_01)	437
RP665	Paschim Minajdi (066_01)	439
RP665	Paschim Minajdi (066_01)	5
RP665	Puali Madaripur (043_00)	57
RP665	Paschim Minajdi (066_02)	654
RP665	Mazidbari (042_00)	86
RP665	Paschim Minajdi (066_02)	908
RP665	Paschim Minajdi (066_02)	909
RP665	Paschim Minajdi (066_02)	910
RP665	Paschim Minajdi (066_02)	911
RP665	Paschim Minajdi (066_02)	912
RP665	Paschim Minajdi (066_02)	913
RP665	Paschim Minajdi (066_02)	914
RP665	Paschim Minajdi (066_02)	915
RP665	Paschim Minajdi (066_02)	916
RP665	Paschim Minajdi (066_02)	917
RP665	Paschim Minajdi (066_02)	918
RP665	Paschim Minajdi (066_02)	919
RP665	Paschim Minajdi (066_02)	920
RP665	Paschim Minajdi (066_02)	921
RP665	Paschim Minajdi (066_02)	922
RP665	Paschim Minajdi (066_02)	923
RP666	Gopalpur (045_00)	306

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP667	Gopalpur (045_00)	312
RP669	Gopalpur (045_00)	275
RP67	Paschim Minajdi (066_02)	816
RP67	Paschim Minajdi (066_02)	819
RP67	Paschim Minajdi (066_02)	875
RP67	Paschim Minajdi (066_02)	876
RP670	Paschim Minajdi (066_01)	326
RP670	Paschim Minajdi (066_01)	342
RP671	Paschim Minajdi (066_01)	326
RP671	Paschim Minajdi (066_01)	328
RP671	Paschim Minajdi (066_01)	329
RP672	Paschim Minajdi (066_01)	227
RP672	Paschim Minajdi (066_01)	328
RP672	Paschim Minajdi (066_01)	331
RP675	Paschim Minajdi (066_01)	308
RP677	Paschim Minajdi (066_01)	202
RP677	Paschim Minajdi (066_01)	203
RP677	Purbba Minajdi (068_00)	204
RP678	Purbba Minajdi (068_00)	203
RP678	Purbba Minajdi (068_00)	204
RP679	Paschim Minajdi (066_01)	174
RP679	Paschim Minajdi (066_01)	175
RP68	Rajdi (078_01)	306
RP680	Kashimpur 075_00	10
RP680	Kashimpur 075_00	119
RP680	Kashimpur 075_00	122
RP680	Kashimpur 075_00	123
RP680	Kashimpur 075_00	131
RP680	Kashimpur 075_00	132
RP680	Kashimpur 075_00	314
RP680	Kashimpur 075_00	315
RP680	Kashimpur 075_00	316
RP680	Kashimpur 075_00	318
RP680	Kashimpur 075_00	320
RP680	Kashimpur 075_00	322
RP680	Kashimpur 075_00	327
RP680	Kashimpur 075_00	328
RP680	Kashimpur 075_00	329
RP680	Kashimpur 075_00	330
RP680	Kashimpur 075_00	332
RP680	Kashimpur 075_00	339
RP680	Kashimpur 075_00	340
RP680	Char Sadipur (304_00)	40
RP680	Char Sadipur (304_00)	45
RP680	Char Sadipur (304_00)	46
RP680	Kashimpur 075_00	68
RP680	Kashimpur 075_00	69
RP680	Kashimpur 075_00	7
RP680	Kashimpur 075_00	70
RP680	Kashimpur 075_00	71
RP680	Kashimpur 075_00	72
RP680	Kashimpur 075_00	73
RP680	Kashimpur 075_00	9

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP681	Char Lakshimi (305_00)	1
RP681	Char Sadipur (304_00)	12
RP681	Kashtagar (091_00)	121
RP681	Kashtagar (091_00)	122
RP681	Kashtagar (091_00)	123
RP681	Char Sadipur (304_00)	124
RP681	Kashtagar (091_00)	124
RP681	Kashtagar (091_00)	125
RP681	Kashtagar (091_00)	126
RP681	Badardi (074_00)	128
RP681	Kashtagar (091_00)	128
RP681	Badardi (074_00)	131
RP681	Char Sadipur (304_00)	135
RP681	Char Sadipur (304_00)	139
RP681	Char Sadipur (304_00)	140
RP681	Kashtagar (091_00)	140
RP681	Char Sadipur (304_00)	141
RP681	Char Sadipur (304_00)	144
RP681	Char Sadipur (304_00)	145
RP681	Char Sadipur (304_00)	146
RP681	Char Sadipur (304_00)	147
RP681	Char Sadipur (304_00)	148
RP681	Char Sadipur (304_00)	149
RP681	Char Sadipur (304_00)	15
RP681	Char Sadipur (304_00)	150
RP681	Char Sadipur (304_00)	151
RP681	Char Sadipur (304_00)	162
RP681	Char Sadipur (304_00)	164
RP681	Kashtagar (091_00)	165
RP681	Kashtagar (091_00)	166
RP681	Kashtagar (091_00)	167
RP681	Kashimpur 075_00	172
RP681	Kashimpur 075_00	173
RP681	Kashimpur 075_00	174
RP681	Kashimpur 075_00	179
RP681	Char Sadipur (304_00)	18
RP681	Kashimpur 075_00	180
RP681	Char Sadipur (304_00)	19
RP681	Kashtagar (091_00)	191
RP681	Kashtagar (091_00)	192
RP681	Char Sadipur (304_00)	195
RP681	Kashtagar (091_00)	196
RP681	Kashtagar (091_00)	197
RP681	Char Sadipur (304_00)	21
RP681	Char Sadipur (304_00)	22
RP681	Char Sadipur (304_00)	23
RP681	Char Sadipur (304_00)	24
RP681	Char Sadipur (304_00)	25
RP681	Kashimpur 075_00	283
RP681	Kashimpur 075_00	284
RP681	Kashimpur 075_00	287
RP681	Kashimpur 075_00	288
RP681	Kashimpur 075_00	289



<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP681	Kashimpur 075_00	290
RP681	Char Sadipur (304_00)	3
RP681	Kashimpur 075_00	305
RP681	Kashimpur 075_00	309
RP681	Kashimpur 075_00	324
RP681	Kashimpur 075_00	335
RP681	Kashimpur 075_00	337
RP681	Char Sadipur (304_00)	39
RP681	Char Sadipur (304_00)	4
RP681	Char Sadipur (304_00)	40
RP681	Char Sadipur (304_00)	41
RP681	Char Sadipur (304_00)	43
RP681	Char Sadipur (304_00)	44
RP681	Char Sadipur (304_00)	45
RP681	Char Sadipur (304_00)	47
RP681	Char Sadipur (304_00)	48
RP681	Lakhimpur Pakhara (092_00)	480
RP681	Char Sadipur (304_00)	49
RP681	Char Sadipur (304_00)	50
RP681	Char Sadipur (304_00)	54
RP681	Lakhimpur Pakhara (092_00)	550
RP681	Lakhimpur Pakhara (092_00)	551
RP681	Lakhimpur Pakhara (092_00)	556
RP681	Lakhimpur Pakhara (092_00)	557
RP681	Lakhimpur Pakhara (092_00)	569
RP681	Lakhimpur Pakhara (092_00)	571
RP681	Lakhimpur Pakhara (092_00)	572
RP681	Lakhimpur Pakhara (092_00)	573
RP681	Lakhimpur Pakhara (092_00)	578
RP681	Lakhimpur Pakhara (092_00)	580
RP681	Lakhimpur Pakhara (092_00)	581
RP681	Lakhimpur Pakhara (092_00)	598
RP681	Char Sadipur (304_00)	6
RP681	Char Sadipur (304_00)	67
RP681	Char Sadipur (304_00)	68
RP681	Char Sadipur (304_00)	7
RP681	Char Sadipur (304_00)	8
RP683	Purbba Minajdi (068_00)	166
RP683	Purbba Minajdi (068_00)	176
RP683	Purbba Minajdi (068_00)	189
RP683	Purbba Minajdi (068_00)	203
RP683	Purbba Minajdi (068_00)	204
RP683	Purbba Minajdi (068_00)	220
RP683	Purbba Minajdi (068_00)	221
RP683	Purbba Minajdi (068_00)	223
RP683	Purbba Minajdi (068_00)	239
RP683	Purbba Minajdi (068_00)	245
RP683	Purbba Minajdi (068_00)	259
RP683	Purbba Minajdi (068_00)	260
RP683	Purbba Minajdi (068_00)	261
RP683	Purbba Minajdi (068_00)	313
RP683	Purbba Minajdi (068_00)	314
RP683	Purbba Minajdi (068_00)	319

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP684	Char Fathebahadurpur (424_05)	3851
RP684	Char Fathebahadurpur (424_05)	3852
RP684	Char Fathebahadurpur (424_05)	3853
RP684	Char Fathebahadurpur (424_05)	3855
RP684	Char Fathebahadurpur (424_05)	3856
RP684	Char Fathebahadurpur (424_05)	3863
RP684	Char Fathebahadurpur (424_05)	3864
RP685	Char Fathebahadurpur (424_05)	3875
RP687	Char Fathebahadurpur (424_05)	3869
RP687	Char Fathebahadurpur (424_05)	3870
RP687	Char Fathebahadurpur (424_05)	3871
RP69	Rajdi (078_01)	311
RP69	Rajdi (078_01)	312
RP69	Rajdi (078_01)	788
RP690	Char Fathebahadurpur (424_05)	3712
RP690	Char Fathebahadurpur (424_05)	3985
RP690	Char Fathebahadurpur (424_05)	4084
RP690	Char Fathebahadurpur (424_05)	4087
RP690	Char Fathebahadurpur (424_05)	4090
RP690	Char Fathebahadurpur (424_05)	4103
RP690	Char Fathebahadurpur (424_05)	4338
RP690	Char Fathebahadurpur (424_05)	4340
RP690	Char Fathebahadurpur (424_05)	4350
RP690	Char Fathebahadurpur (424_05)	4354
RP692	Char Fathebahadurpur (424_05)	4025
RP692	Char Fathebahadurpur (424_05)	4026
RP692	Char Fathebahadurpur (424_05)	4027
RP692	Char Fathebahadurpur (424_05)	4029
RP693	Dakshin Janardandi (067_01)	180
RP694	Lamchari (298_02)	593
RP694	Lamchari (298_02)	597
RP694	Lamchari (298_02)	598
RP694	Lamchari (298_02)	602
RP694	Lamchari (298_02)	605
RP694	Lamchari (298_02)	606
RP694	Lamchari (298_02)	607
RP694	Lamchari (298_02)	608
RP694	Lamchari (298_02)	609
RP694	Lamchari (298_02)	610
RP694	Lamchari (298_02)	611
RP694	Lamchari (298_02)	663
RP695	Mazidbari (042_00)	12
RP695	Dakshin Gopalpur (044_00)	308
RP698	Paschim Minajdi (066_02)	809
RP7	Rajdi (078_01)	626
RP7	Rajdi (078_01)	628
RP700	Bibhagdi (422_02)	1949
RP700	Bibhagdi (422_02)	1950
RP700	Bibhagdi (422_02)	1960
RP701	Bibhagdi (422_02)	1955
RP701	Bibhagdi (422_02)	1956
RP704	Char Lakshimi (305_00)	183
RP704	Char Lakshimi (305_00)	184

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP705	Lamchari (298_02)	594
RP705	Lamchari (298_02)	600
RP709	Char Sadipur (304_00)	199
RP709	Char Sadipur (304_00)	204
RP709	Char Sadipur (304_00)	205
RP709	Char Sadipur (304_00)	209
RP709	Char Sadipur (304_00)	210
RP71	Rajdi (078_01)	792
RP71	Rajdi (078_01)	793
RP71	Rajdi (078_01)	794
RP710	Rajdi (078_02)	1391
RP710	Rajdi (078_02)	1404
RP710	Rajdi (078_02)	1405
RP710	Rajdi (078_02)	1427
RP710	Rajdi (078_02)	1428
RP710	Rajdi (078_02)	1429
RP710	Rajdi (078_02)	1430
RP710	Rajdi (078_02)	1431
RP710	Rajdi (078_02)	1434
RP711	Pangashia (079_01)	488
RP713	Pangashia (079_01)	632
RP713	Pangashia (079_01)	637
RP713	Pangashia (079_01)	638
RP714	Pangashia (079_01)	394
RP715	Mazidbari (042_00)	20
RP715	Mazidbari (042_00)	21
RP716	Mazidbari (042_00)	18
RP716	Mazidbari (042_00)	19
RP716	Mazidbari (042_00)	20
RP716	Mazidbari (042_00)	21
RP716	Mazidbari (042_00)	22
RP717	Mazidbari (042_00)	21
RP717	Mazidbari (042_00)	56
RP717	Mazidbari (042_00)	57
RP718	Mazidbari (042_00)	21
RP718	Mazidbari (042_00)	23
RP718	Mazidbari (042_00)	24
RP718	Mazidbari (042_00)	25
RP719	Mazidbari (042_00)	56
RP719	Mazidbari (042_00)	59
RP719	Mazidbari (042_00)	60
RP720	Mazidbari (042_00)	59
RP720	Mazidbari (042_00)	61
RP721	Mazidbari (042_00)	100
RP721	Mazidbari (042_00)	54
RP721	Mazidbari (042_00)	61
RP721	Mazidbari (042_00)	99
RP722	Mazidbari (042_00)	105
RP722	Mazidbari (042_00)	51
RP723	Mazidbari (042_00)	138
RP723	Mazidbari (042_00)	139
RP723	Mazidbari (042_00)	146
RP724	Mazidbari (042_00)	108

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP724	Mazidbari (042_00)	109
RP724	Mazidbari (042_00)	110
RP724	Mazidbari (042_00)	115
RP724	Mazidbari (042_00)	136
RP725	Mazidbari (042_00)	189
RP726	Bibhagdi (422_02)	1853
RP726	Bibhagdi (422_02)	1982
RP728	Paschim Minajdi (066_01)	201
RP728	Paschim Minajdi (066_01)	202
RP73	Kashimpur 075_00	193
RP730	Rajdi (078_02)	1092
RP730	Rajdi (078_02)	1377
RP730	Rajdi (078_02)	1378
RP731	Rajdi (078_02)	1071
RP731	Rajdi (078_02)	1087
RP732	Pangashia (079_01)	495
RP732	Pangashia (079_01)	497
RP732	Pangashia (079_01)	530
RP733	Dakshin Thengamara (081_00)	250
RP735	Gopalpur (045_00)	538
RP735	Gopalpur (045_00)	558
RP737	Gopalpur (045_00)	537
RP738	Gopalpur (045_00)	558
RP738	Gopalpur (045_00)	560
RP74	Kashimpur 075_00	179
RP741	Gopalpur (045_00)	559
RP743	Pangashia (079_02)	1168
RP751	Dari Char Lakshimpur (421_02)	1201
RP751	Dari Char Lakshimpur (421_02)	1237
RP751	Dari Char Lakshimpur (421_02)	1238
RP751	Dari Char Lakshimpur (421_02)	1239
RP751	Dari Char Lakshimpur (421_02)	1243
RP751	Dari Char Lakshimpur (421_02)	1244
RP751	Dari Char Lakshimpur (421_02)	1257
RP751	Dari Char Lakshimpur (421_02)	1258
RP751	Dari Char Lakshimpur (421_02)	1259
RP751	Dari Char Lakshimpur (421_02)	1260
RP751	Dari Char Lakshimpur (421_02)	1261
RP751	Dari Char Lakshimpur (421_02)	1329
RP752	Dari Char Lakshimpur (421_02)	1246
RP752	Dari Char Lakshimpur (421_02)	1252
RP752	Dari Char Lakshimpur (421_02)	1253
RP752	Dari Char Lakshimpur (421_02)	1254
RP752	Dari Char Lakshimpur (421_02)	1255
RP753	Bibhagdi (422_01)	123
RP753	Bibhagdi (422_01)	124
RP753	Bibhagdi (422_01)	125
RP753	Bibhagdi (422_01)	126
RP753	Bibhagdi (422_01)	127
RP753	Bibhagdi (422_01)	128
RP753	Bibhagdi (422_01)	129
RP753	Bibhagdi (422_01)	140
RP753	Bibhagdi (422_01)	141

<b>Id</b>	<b>Mouza Name</b>	<b>Plot No.</b>
RP753	Bibhagdi (422_01)	142
RP753	Bibhagdi (422_01)	150
RP753	Bibhagdi (422_01)	151
RP753	Bibhagdi (422_01)	152
RP753	Bibhagdi (422_01)	154
RP753	Bibhagdi (422_01)	155
RP753	Bibhagdi (422_01)	156
RP753	Bibhagdi (422_01)	158
RP753	Bibhagdi (422_01)	161
RP753	Bibhagdi (422_01)	189
RP753	Bibhagdi (422_01)	190
RP753	Bibhagdi (422_01)	193
RP753	Bibhagdi (422_01)	295
RP753	Char Lakshimi (305_00)	366
RP753	Char Lakshimi (305_00)	367
RP753	Char Lakshimi (305_00)	368
RP753	Char Lakshimi (305_00)	369
RP753	Char Lakshimi (305_00)	370
RP753	Char Lakshimi (305_00)	371
RP753	Char Lakshimi (305_00)	372
RP753	Char Lakshimi (305_00)	373
RP753	Char Lakshimi (305_00)	374
RP753	Lamchari (298_02)	630
RP753	Lamchari (298_02)	631
RP753	Lamchari (298_02)	636
RP753	Lamchari (298_02)	637
RP753	Lamchari (298_02)	638
RP753	Lamchari (298_02)	639
RP753	Lamchari (298_02)	640
RP753	Lamchari (298_02)	641
RP753	Lamchari (298_02)	642
RP753	Lamchari (298_02)	643
RP753	Lamchari (298_02)	644
RP753	Lamchari (298_02)	645
RP753	Lamchari (298_02)	646
RP753	Lamchari (298_02)	647
RP753	Lamchari (298_02)	648
RP754	Lakhimipur Pakhara (092_00)	12
RP754	Lakhimipur Pakhara (092_00)	124
RP754	Lakhimipur Pakhara (092_00)	125
RP754	Lakhimipur Pakhara (092_00)	126
RP754	Lakhimipur Pakhara (092_00)	127
RP754	Lakhimipur Pakhara (092_00)	13
RP754	Lakhimipur Pakhara (092_00)	90
RP754	Lakhimipur Pakhara (092_00)	92
RP754	Lakhimipur Pakhara (092_00)	93
RP754	Lakhimipur Pakhara (092_00)	97
RP754	Lakhimipur Pakhara (092_00)	98
RP755	Pangashia (079_02)	1203
RP755	Pangashia (079_02)	1212
RP755	Pangashia (079_02)	1219
RP755	Pangashia (079_02)	1220
RP756	Dakshin Janardandi (067_01)	10

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RP756	Dakshin Janardandi (067_01)	13
RP756	Dakshin Janardandi (067_01)	14
RP756	Dakshin Janardandi (067_01)	15
RP756	Purbba Minajdi (068_00)	245
RP756	Paschim Minajdi (066_01)	266
RP756	Paschim Minajdi (066_01)	267
RP756	Paschim Minajdi (066_01)	272
RP756	Paschim Minajdi (066_01)	276
RP756	Paschim Minajdi (066_01)	277
RP756	Paschim Minajdi (066_01)	282
RP756	Paschim Minajdi (066_01)	285
RP756	Paschim Minajdi (066_01)	286
RP756	Paschim Minajdi (066_01)	300
RP756	Paschim Minajdi (066_01)	302
RP756	Paschim Minajdi (066_01)	308
RP756	Paschim Minajdi (066_01)	318
RP756	Paschim Minajdi (066_01)	319
RP756	Paschim Minajdi (066_01)	320
RP756	Paschim Minajdi (066_01)	321
RP756	Paschim Minajdi (066_01)	324
RP756	Paschim Minajdi (066_01)	339
RP756	Dakshin Janardandi (067_01)	34
RP756	Paschim Minajdi (066_01)	340
RP756	Paschim Minajdi (066_01)	341
RP756	Paschim Minajdi (066_01)	342
RP756	Paschim Minajdi (066_01)	343
RP756	Paschim Minajdi (066_01)	344
RP756	Paschim Minajdi (066_01)	349
RP756	Dakshin Janardandi (067_01)	35
RP756	Paschim Minajdi (066_01)	351
RP756	Dakshin Janardandi (067_01)	50
RP756	Dakshin Janardandi (067_01)	51
RP756	Dakshin Janardandi (067_01)	70
RP756	Dakshin Janardandi (067_01)	77
RP756	Dakshin Janardandi (067_01)	78
RP756	Dakshin Janardandi (067_01)	80
RP756	Dakshin Janardandi (067_01)	81
RP756	Dakshin Janardandi (067_01)	9
RP757	Gopalpur (045_00)	271
RP757	Gopalpur (045_00)	273
RP757	Gopalpur (045_00)	297
RP758	Gopalpur (045_00)	163
RP758	Gopalpur (045_00)	164
RP758	Gopalpur (045_00)	165
RP758	Gopalpur (045_00)	177
RP758	Gopalpur (045_00)	178
RP758	Gopalpur (045_00)	179
RP758	Gopalpur (045_00)	191
RP758	Gopalpur (045_00)	192
RP758	Gopalpur (045_00)	193
RP758	Gopalpur (045_00)	194
RP758	Gopalpur (045_00)	195
RP758	Gopalpur (045_00)	351

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RP758	Gopalpur (045_00)	352
RP758	Gopalpur (045_00)	353
RP758	Gopalpur (045_00)	355
RP758	Gopalpur (045_00)	356
RP758	Gopalpur (045_00)	361
RP758	Gopalpur (045_00)	362
RP758	Gopalpur (045_00)	363
RP758	Gopalpur (045_00)	63
RP758	Gopalpur (045_00)	70
RP758	Gopalpur (045_00)	71
RP758	Gopalpur (045_00)	72
RP758	Gopalpur (045_00)	73
RP758	Gopalpur (045_00)	74
RP758	Gopalpur (045_00)	76
RP758	Gopalpur (045_00)	77
RP758	Gopalpur (045_00)	78
RP759	Gopalpur (045_00)	1
RP759	Puali Madaripur (043_00)	1
RP759	Puali Madaripur (043_00)	10
RP759	Puali Madaripur (043_00)	11
RP759	Puali Madaripur (043_00)	2
RP759	Gopalpur (045_00)	290
RP759	Gopalpur (045_00)	323
RP759	Gopalpur (045_00)	324
RP759	Gopalpur (045_00)	360
RP759	Gopalpur (045_00)	378
RP759	Gopalpur (045_00)	379
RP759	Puali Madaripur (043_00)	46
RP759	Puali Madaripur (043_00)	51
RP759	Puali Madaripur (043_00)	53
RP759	Gopalpur (045_00)	536
RP759	Gopalpur (045_00)	539
RP759	Gopalpur (045_00)	552
RP759	Gopalpur (045_00)	557
RP759	Gopalpur (045_00)	563
RP759	Gopalpur (045_00)	566
RP759	Puali Madaripur (043_00)	8
RP760	Gopalpur (045_00)	402
RP760	Gopalpur (045_00)	403

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RP760	Gopalpur (045_00)	406
RP760	Gopalpur (045_00)	407
RP760	Gopalpur (045_00)	408
RP761	Gopalpur (045_00)	169
RP761	Gopalpur (045_00)	171
RP761	Gopalpur (045_00)	172
RP761	Gopalpur (045_00)	173
RP762	Gopalpur (045_00)	166
RP762	Gopalpur (045_00)	168
RP762	Gopalpur (045_00)	173
RP762	Gopalpur (045_00)	576
RP765	Kashtagar (091_00)	156
RP765	Kashtagar (091_00)	158
RP78	Kashimpur 075_00	163
RP79	Kashimpur 075_00	135
RP79	Kashimpur 075_00	170
RP79	Kashimpur 075_00	171
RP80	Badardi (074_00)	128
RP81	Badardi (074_00)	187
RP82	Kashimpur 075_00	176
RP87	Kashtagar (091_00)	120
RP87	Kashimpur 075_00	317
RP88	Kashtagar (091_00)	117
RP88	Kashtagar (091_00)	118
RP88	Kashtagar (091_00)	119
RP89	Kashtagar (091_00)	119
RP9	Rajdi (078_01)	370
RP9	Rajdi (078_01)	373
RP90	Kashtagar (091_00)	111
RP94	Gopalpur (045_00)	321
RP94	Gopalpur (045_00)	322
RP97	Puali Madaripur (043_00)	28
RP97	Puali Madaripur (043_00)	29
RP97	Puali Madaripur (043_00)	30
RP97	Puali Madaripur (043_00)	42
RP99	Paschim Minajdi (066_01)	346
RP99	Paschim Minajdi (066_01)	347