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JHIKARGACHHA PAURASHAVA
MASTER PLAN: 2011-2031

March 2015

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

JHIKARGACHHA PAURASHAVA MASTER PLAN: 2011-2031

STRUCTURE PLAN

URBAN AREA PLAN:

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

WARD ACTION PLAN

March, 2015



JHIKARGACHHA PAURASHAVA
JHIKARGACHHA, JESSORE

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PREFACE

Bangladesh has been experiencing rapid urbanization in the last four decades where level of urbanization has reached from 7.60% to nearly 29% between 1970 and 2011. Multidimensional complex factors like; socio-economic, political, demographic and climatic are responsible for this higher growth of spatial transformation. The fast urbanization is putting pressure on the small towns' limited land, urban services and environment along with countries big cities. Whereas urbanization is also considered as an opportunity and an integral part of the development process. Proper development plans and guidelines with necessary legislative measures and appropriate institutional arrangement can help to achieve sustainable urban as well as rural development.

However, presently, the Paurashavas has the legal mandate to take initiatives of formulating development plans, providing infrastructure and other services and creating opportunities for people to initiate developments with sustainable and harmonic approach. In this regards, Jhikargachha 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 Jhikargachha Paurashava.

Master Plan of Jhikargachha Paurashava has been prepared following the pre-requisite of the Local Government (Paurashava) Act, 2009. To prepare the Master Plan, LGED engaged consulting firm named Development Design Consultant Ltd. and set up a Project Management Office (PMO) deploying a Project Director, Deputy Project Director, experienced Urban Planners as Individual Consultant and support staffs. Regular monitoring, evaluation and feedback from PMO had also accelerate the pace and quality of the Master Plan preparation tasks. During formulation of the Master Plan, the Paurashava authority along with the project and the Consultant ensure people's opinion, observation and expectation in various ways: conducting sharing meetings, Public Hearing etc. At the end of the formulation process, the Paurashava completed all procedures necessary for its approval as per the related clauses and sub-clauses of the Local Government (Paurashava) Act, 2009. Paurashava Authority has submitted this Plan to the Local Government Division of the Ministry of Local Government, Rural Development and Cooperatives for final approval and gazette notification.

This Master Plan comprises of three tier of Plan in a hierarchical order, these are: Structure Plan for 20 years, Urban Area Plan for 10 years and Ward Action Plan for 5 years. Urban Area Plan also comprises of three components namely; Land Use Plan, Traffic & Transportation Management Plan and Drainage & Environmental Management Plan. This Master plan will serve as guidelines for the future infrastructure development of Jhikargachha Paurashava together with land use control and effective management of service facilities.

The Paurashava Authority acknowledges the full support and all out cooperation from the consultant team, the Project Management office of UTIDP, LGED, Local Government Division of the Local

Government, Rural Development and Cooperatives Ministry, public representatives, other stakeholders and civil society with deepest gratitude for accomplishing this remarkable assignment.

Cooperation and participation from national to local authorities, all government institutions, private entities and people of Jhikargachha Paurashava will be necessary to implement this Master Plan successfully and make this Paurashava developed and livable. I hope Jhikargachha Paurashava will be a model Paurashava in Bangladesh through building itself green and sustainable by successful implementation of this Master Plan.

(Mustafa Anwar Pasha)

Mayor

Jhikargachha Paurashava

Executive Summary

Jhikargachha Paurashava is located in the north-eastern part of Jhikargachha Upazila under Jessore district. It is situated at the middle of Jessore District H.Q. and around 15 km off it. It is bounded by Jhikargachha Union in the North and East, Panisora Union in the South and Godkhali Union in the West. Jhikargachha Paurashava is connected with surrounding areas by both Roads and well connected with District Headquarter and Benapole Port Town with Rail network. This Paurashava lies on 23⁰06' north latitude and 89⁰05' east longitude.

According to the BBS 2011 (Jessore District), the population of Jhikargachha Paurashava is 32,774 of which 16,045 (48.96%) are male and 16,729 (51.04%) are female. The projected population of Jhikargachha Paurashava would be 45438 with a growth rate of 1.65%. The population of Jhikargachha is Muslim, Hindu, Buddhist and other tribal people. At present the density of population is 2957 per sq.km. Jhikargachha Paurashava consists of 09 mouzas with an area of 11.08 sq. km. as per area calculation of GIS data.

Jhikargachha Thana was turned into an upazila in 1983 and the Paurashava was established in 1998. Its present status is **“B” Class** Paurashava.

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

The Master Plan is prepared in three tiers. First one is Structure Plan, then Urban Area Plan and finally Ward Action Plan. The Structure Plan provides the policies that will guide the future development of the Paurashava. In the Structure Plan of Jhikargachha Paurashava 9.34% land is kept as core area, 26.47% as fringe and peripheral area, 18.17% as new urban area, 14.22% as circulation network and the remaining 26.52% as agricultural area and 5.28% as water body to support the future need for food and other agricultural products of the town and to facilitate the future drainage network. The Structure Plan proposes the restructuring of the organogram of the Paurashava and inclusion of town planning department comprising town planners. This will ensure the better implementation and monitoring of the plan. It also proposes the system of periodic review and updating of the plan and also the resource mobilization process.

Urban Area Plan consists three types of Plans; Land Use Plan, Traffic and Transportation Management Plan and Drainage and Environmental Management Plan. Under the Land Use Plan the future land use of the Paurashava is proposed according to the fixed standards during the interim phase of the Master Plan.

Land Use Plan proposes the Paurashava land to be earmarked under Urban Residential Zone and Rural Settlement. These two zones will form the future residential areas of the Paurashava. Proposals for other land uses like Commercial Zone, Education and Research Zone, Open Space, Circulation Network etc. are made. Under the Land Use Plan the development proposals to support the future needs of the people are also given. It proposes one general industrial zone, one heavy industrial zone, neighborhood market, super market, stadium, hospital, waste disposal ground, land for poor people, bus terminal, truck terminal, tempo stand, parking area, central park, college, high school, primary school, neighborhood park, community centre and many other facilities.

In the Traffic and Transportation Management Plan the Road Network Plan is proposed. The transportation facilities are proposed here in this plan. In the Road Network Plan of the Paurashava 61.17 km of road for widening and 57.99 km for construction of new road is proposed. The road hierarchy is also proposed in this plan. The proposed road network will comprise of primary road (100-150 ft. RoW), secondary road (60-100ft. RoW), local road (20-40 ft. RoW). The proposed road network and the transportation facilities along with the proposed management system will provide a good system of management for future traffic and transportation problems. The proposed transportation facilities include bus terminal, truck terminal, bus-stand, auto-rickshaw/tempo/microbus stands, parking area and some other proposals.

Under the Drainage and Environmental Management Plan the drainage network of the Paurashava is proposed. This plan will analyze drainage aspects in the planning of the Paurashava, study geological fault and lineament of the project area and its surroundings, study the existing water development, flood protection and flood control project (if any) in the area and their impacts in the Paurashava plan, present planning options for drainage of the future Paurashava area, study conservation of the natural resources like parks, open space, water bodies, existing ponds etc. and conserve place of historical, architectural (if any) and agricultural importance including natural fisheries. At present there is only 18.33 km of pucca drain in the Paurashava and the river and natural canals cover 5.24 km. This network is not enough to support the present need and will not be suitable to support in the future. That is why the consultants proposed a comprehensive network of drains that comprises **4.02** km of primary drain, **18** km of secondary drain and **79.21** km of tertiary drain are proposed in the plan to support the drainage network.

Ward Action Plan is the third and final tier of the Master Plan which prepared including the proposals that will be implemented during the first to fifth year of the Master Plan period. Two or more Ward Action Plans will be prepared under this Master Plan to address the need of the people for the remaining fifteen-year's period of the Master Plan. This first Ward Action Plan, which is described in this report, addresses the urgent needs of the people of the Paurashava and incorporates those in the Master Plan. It analyzes the immediate requirements of the people living in the nine wards of the Paurashava and then provides facilities in a manner that it support the particular ward in the first phase of the Master Plan period of twenty years.

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

Final Master Plan Report of Jhikargachha Paurashava

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LIST OF ABBREVIATIONS AND ACRONYMS

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

LIST OF LOCAL TERMS

Baro	Big
Bazar	Market
Char	piece of land rising from the river and sea
Chota	Small
Dighi	Tank
Ghat	Boat Terminal
Goru	Cow
Hat	Weekly and Occasional Market
Jame	Offer Prayer Five Times Daily except Jumma for Muslims
Kancha Bazar	Kitchen Market
Katcha	Fresh/earthen
Khal	Canal
Matshaya	Fish
Mondir	Temple
More	Intersection
Mouza	Land Measurement Unit
Murgi	Poultry
Nouka	Boat
Pan	Beetle Leaf
Panjegana	Offer Prayer Five Times Daily except Jumma for Muslims
Pool	Traditional Culvert/bridge
Potti	Community/Locality
Paurashava	Municipality
Pucca	Permanent Structure
Shahar	Town
Shahid Minar	Memorandum for Martyrs
Tempo	Human hawler
Thela	Push Cart

LIST OF TECHNICAL TERMS

Acre	1 ² km = 247.1044 acre
Bigha	1 Bigha = 14400 sq. ft.
Katha	1 Katha = 720 sq. ft.
Lakh	1 Lakh = 100 Thousand

Chapter 1

INTRODUCTION

1.1 Introduction

Urbanization in Bangladesh is moving at a rapid pace. The Country urban population has grown at a yearly average rate of 6 percent since independence, at a time when the national population growth was 2.2 percent. As a result, urban population has grown six-fold, compared with a 70 percent increase in rural population. As per UN data, about 35 million people, or approximately 25 percent of Bangladesh's population, currently live in urban areas, compared to only 8 percent at the time of independence: the number is projected to cross 80 million by the year 2030 (source: UN World Urbanization prospects, 2010). The importance of urban development is emphasized in terms of its role in the national economy. More than 60% of the national GDP is derived from the non-agricultural sectors that are based in urban areas. Again, the most foreign exchange earning sectors, like, garment and knitwear enterprises are agglomerated in urban areas. These sectors earn over 70% of the foreign exchange. Remittance is also a major sector of foreign exchange earnings and a large share of the remittance goes into the purchase of urban land. Surplus remittance is invested in business and manufacturing located in urban areas. These phenomena indicate the increasing role of urban areas being played in the national economy. The expansion of urban economy leads to the growth of urban population and concomitant haphazard urban spatial growth without planning. The rapid urbanization is also marked by creation of Paurashava, whose number presently stands at about 309. Paurashava are created not only to provide urban services to its citizens but also to create a livable environment through development of planned and environmentally sound living space.

It is very likely, as can be seen from the past trend; urban centers are going to be the focus of future employment and economic regeneration. The population and economic growth, particularly, in large urban centers is likely to boost in next few decades creating increased burden on them. The smaller urban centers imbued with opportunities for investment and livable environment can help release pressure on big cities at the same time serve as growth poles for development of undeveloped hinter lands. Without adequate infrastructure and services provision to support the increasing population and activities the small urban centers would not be able make themselves as the focal points to attract investment. Planned development of infrastructure and services and development control through land use plan and execution of BC rules is essential to develop smaller urban centers environmentally and render them congenial places to live and work.

The present infrastructure provisions in Paurashava are in a precarious state. Drains are mostly clogged that cannot drain out excess water during heavy rains, natural drainage systems have either been filled up or occupied by land grabbers creating water logging during monsoon. Traffic in Paurashava is increasing day by day with the increase in population and consequent demand. But the sub-standard road network can hardly keep pace with the growing demand for movement; as a result congestion becomes a common problem. Road networks are not developed in planned and systematic way leaving room for traffic congestion that increases economic loss to the people due to travel delay. The land use development in the Paurashava is unorganized and unplanned, which is a major source of environment degradation. Building Construction Rules are not

Part A: Structure Plan

effectively enforced in Paurashavas mainly for want of a well formulated master plan and qualified planning professional.

Under the above circumstances it is high time to think about problems that might emerge in future if they are not addressed now. To overcome all the likely problems to come in future, the Paurashava should go for planned development through preparation of a master plan and move the development forward accordingly. Side by side strengthening its planning department. The master plan can be prepared exercising the power conferred to them by the Paurashava Ordinance 2009. The Upazila Town Infrastructure Development Project aims to prepare master plan for 223 Paurashavas / Upazilas and develop infrastructure during next 20 years. The project keeps provision for a separate plan for land use control, drainage and environment, traffic and transportation management and improvement. The project aims to prepare a Ward Action Plan to ensure systematic execution of future infrastructure development projects. There is also aim to prepare proposals to enhance Paurashava's revenue earning so that it becomes more capable to meet its own capital needs. The master plan of Jhikargachha Paurashava suggests development of new roads, drainage facilities, street lights, markets, bus stands, solid waste management, sanitation, water supply and other such infrastructure facilities in order to equip the Paurashava to face future challenges of urbanization and economic regeneration.

1.2 Objectives

According to the Terms of Reference the objectives of Jhikargachha Paurashava Master Plan are:

- a. Find out development issues and potentials of the Jhikargachha Paurashava and make a 20 years development vision and prepare a Master Plan for development in line with the vision;
- b. Prepare a plan for the people of the Jhikargachha town to develop and update the provisions for transport network, housing, infrastructures for roads, markets, bus terminals, sanitation, water supply, drainage, solid waste management, electricity, education, leisure and such other infrastructure facilities for meeting the social and community needs of the people in general and poor and the disadvantaged groups in particular, to improve quality of life;
- c. Prepare multi-sector short and long term investment plans through participatory approach to improve living standards by identifying area based priority development projects in accordance with the principle of sustainability;
- d. Provide controls for private sector development and clarity and security with regard to future development;
- e. Provide guide line for development considering the opportunity and constraints of future development of Jhikargachha Paurashava as the Upazila Town; and
- f. Prepare a 20-year Master Plan to be used as a tool to ensure and promote growth of the town and control any unplanned growth by any private and public organization.

1.3 Approach and Methodology

1.3.1 Survey and Data Collection

Extensive Topographic and Physical Feature survey, Land use survey, Drainage and Environmental Management survey, Transportation and Traffic Management survey were carried out by the consultant under the close supervision of PMO and Jhikargachha Paurashava Officials using sophisticated modern technology (i.e. RTK-GPS, Total Station etc.). Special care was taken for generalized land use survey to collect physical information and for indication of existing land use and development pattern. Questionnaire survey was administered for collection of

Part A: Structure Plan

socio-economic information of the local citizens. Data and information were also collected from Paurashava officials, local elites/leaders, to serve the purpose for preparation of a landuse plan. Master plan maps for Jhikargachha Paurashava has been prepared using different scales (i.e. 1:1980, 1:3960) as per ToR to indicate possible intensive development zone and development pattern thereof during successive stages of development within the project area.

1.3.2 Review of Existing Conditions and Plan Preparation

After survey and analysis of existing conditions the planning phase began. Review of the planning area revealed the problems and opportunities. This was followed by a Paurashava Master Plan with such components as Structure Plan, Urban Area Plan and Ward Action Plans. Structure Plan provided the long term planning principles, while the Urban Area Plan set down the mid level development proposals covering major infrastructure and services. The ward Action Plan made detailed local level development proposals in minor detail. The major issues covered in the Paurashava Master included the following,

- future land use;
- road infrastructure;
- drainage;
- utility and community services;
- education and health facilities.

Thematic maps on above issues were prepared and narrative description was prepared for development proposals.

1.4 Activities Undertaken

The consultant has to undertaken the following major activities for preparation of the Jhikargachha Paurashava Master Plan.

a. Visit to the Paurashava

The consultant team leader and or other team members of the project visited to the Paurashava on several occasions. The visits were mainly for two purposes, **first**, to acquaint themselves with the town- its problems and opportunities and **second**, to make aware the Pura people and the local stakeholders about the plan making and seeking their opinion and cooperation in this respect.

b. Inception Seminar/Meeting and Plan Consultation with the Stakeholders in the Paurashava

The consultant has arranged an Inception Seminar/Meeting at the Paurashava level at the project inception level in cooperation with the Jhikargachha Paurashava Authority and disseminated the stakeholders including the Paurashava about the scope and Terms of Reference for the preparation of Master Plan. Views were exchanged with the stakeholders regarding the problems and opportunities of the Paurashava to develop a 20 year development vision for the Paurashava linking the ideas and views received. On completion of the draft final plan a consultation meeting was arranged at Paurashava Office where the plan proposals were disseminated and opinions from the stakeholders sought.

c. Determination of Study Area

The consultant has to determine the study area or the area to be covered under the current planning exercise based on existing condition, demand of the Paurashava and potential scope for

Part A: Structure Plan

future development. The consultant determined Structure Plan Area as 2142.84 acres or 8.67 sq. km. **Map- 1.1** shows the planning area location of Jhikargachha Paurashava.

d. Assessment of Drainage System and Preparation of Drainage Master Plan

One of the important tasks of the consultant was to Identify and investigate the existing natural and man-made drains, natural river system, assess the extent and frequency of flood, determine area of intervention. The consultant has also studied the contour and topographic maps produced by the relevant agencies and also review any previous drainage Master Plan available for the Paurashava.

After assessment of current situation the consultant prepared a comprehensive (storm water) Drainage Master Plan for the Paurashava for a plan period of 20 years. In such exercise it considered all relevant issues including discharge calculation, catchment areas; design of main and secondary drains along with their size, type and gradients and retention area with preliminary cost estimates for the proposed drainage system.

e. Transportation Planning

For making a comprehensive transportation plan for Jhikargachha Paurashava the consultant carried out the following tasks:

- i. Collected and assessed the essential data relating to existing transport network, relevant regional and national highway development plans, accident statistics, number and type of vehicles registered for Jhikargachha Paurashava.
- ii. Assessed requirements of critical data and collected data through reconnaissance and traffic surveys to estimate present traffic volume, forecast the future traffic growth, and identify travel patterns, areas of traffic conflicts and their underlying causes.
- iii. Studied the viability of different solutions for traffic management and developed a practical short term traffic management plan, including one way system, 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.
- IV. Assessed the non-motorized traffic movement dominated by cycle rickshaws. Special recommendations were made to utilize these transports in best possible way, without causing unnecessary delays to other vehicles. Proposals were also made about pedestrians and their safety, with special attention for the children.
- V. Assessed the current land use with respect to road transportation, bus and truck stations, railway stations etc. and recommend actions to optimize this land use.
- VI. Prepared a road network plan based on topographic and base map prepared under the Jhikargachha Paurashava Master Plan Project. Recommended road development standards, which will serve as a guide for the long and short-term implementation of roads. Also suggested traffic and transportation management plan and the traffic enforcement measure to control traffic movement in a more effective way.

Map no. 1.1: Planning area location of Jhikargachha Paurashava

Chapter 2

Conceptual Issues

2.1 Philosophy of the Master Plan

The philosophy behind Upazila master plan lies in the very motive to community welfare through a process of spatial organization, environmental improvement and provision of amenities to the future generations and control of unwanted development.

2.2 Vision & Objectives

2.2.1 Vision

The vision of the current planning exercise is,

‘to create a sustainable livable environment where all amenities will be there to promote healthy and comfortable living, together will promote local economy to bring prosperity to the urban centre under the condition of good governance.’

2.2.2 Objectives

Following objectives have been considered as the basis of the plans for Jhikargachha Paurashava:

- a. To encourage planned physical growth of the Paurashava
- b. To guide accommodation of future growth of population and economic activity
- c. To extend the provision of services and facilities to create livability
- d. To improve decision-making related to funding of services and facilities
- f. To keep the role of Government as a facilitator, rather than provider
- g. To priorities need of the underprivileged
- h. To give priority to environmental considerations in making decisions related to physical development

2.3 Content and form of the Structure Plan

2.3.1 Concept

Structure Plan is a kind of strategic plan, or a framework plan, or an indicative plan that is presented in maps and explanatory text that are more ‘broad brush’ than master plans. Structure Plan indicates the broad magnitudes and directions of urban growth, including infrastructure networks, the placement of major facilities such as hospitals and Upazila complex. A Structure Plan is not intended to specify detailed lot by lot land use or local road configurations and development proposals. Rather it identifies the areas where growth and change are such that more detailed local and action plans are needed. Structure Plan does not require excessive effort in gathering data is flexible and dynamic and can be changed to accommodate demanded changes. The present Structure Plan is an overall long term strategic plan for Upazila shahars

Structure Plan is the 1st components 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 Plans detail out development proposals under the framework of Structure Plan.

Part A: Structure Plan

2.3.2 Content and form of the Report

The Structure Plan is set out in nine chapters.

Chapter-1 introduces the master plan project with general objectives, approach and methodology and scope of the works.

Chapter-2 presents the conceptual issues explains background of the Paurashava, philosophy of the Master Plan and vision and objectives of the Structure Plan.

Chapter-3 evaluates the present status and the development problems. It serves Paurashava's existing trend of growth which includes social and economic development, physical infrastructure development, environmental issue, population study, institutional capacity of the Paurashava, urban growth area, catchment area, land use and urban services, functional linkage of the Paurashava with the Regional and national network and role of agencies for different sectoral activities.

Chapter-4 Profile of the land use of the Paurashava. It deals with the projection of Future Growth by 2031. Population projection for the year 2031, identification of future economic opportunities and projection of land use are the major discussions of this chapter.

Chapter-5 presents the Paurashava development related policies, laws and regulations. The chapter highlights, land use policy, housing policy, population policy, agricultural policy, transportation policy, environmental policy, industrial policy, health policy and national urban policy. Laws and regulations related to – national reservoir protection act, Bangladesh National Building Code, Building Construction act also indicates in this chapter. Strength and weaknesses of the existing policies also includes here.

Chapter-6 discusses the critical planning issues. Issues related with the transport, environment, land use control and disaster have been emphasized. Issues relevant with the laws and regulations in case of policy formulation are also presented.

Land use development Strategies are the key elements of the Chapter-7.

Land use zoning policies and development strategies are the key elements of the **Chapter-7**. Policies for socio-economic sector, physical infrastructure sector and environmental issues are discussed here.

Implementation Issues are presented in the **Chapter-8**. Emphasize has given on institutional capacity building of the Paurashava and resource mobilization.

2.3.3 The Style and Format of Structure Plan

The format of a Structure Plan comprises written document and indicative or symbolic major development locations presented in maps and diagrams as parts of the report. It is supported by maps and diagrams as parts of the text and large scale working maps to help project implementation and development control.

The total area of Jhikargachha Structure Plan is 2737.41 acres (11.08 sq. km). Map- 2.1 shows the structure plan land use policy map of Jhikargachha Paurashava. All the 9 wards of the Paurashava are covered by Structure Plan area.

Part A: Structure Plan

Map no. 2.1: Structure Plan Landuse policy map of Jhikargachha Paurashava

Part A: Structure Plan

Chapter 3

Review of Present Status and the Development Problems

3.1 Introduction

The current chapter of the report makes a review of the various issues of Jhikargachha Paurashava and unveils its problems. Intent of this chapter is to introduce the readers with the Paurashava issues and the problems. This chapter will help identify critical problems in order to make planning recommendations.

3.2 Sectoral Review of Present Status

This section of the chapter focuses on the present condition of various sectoral issues of Jhikargachha Paurashava.

3.2.1 Societal

Following societal issues have been identified in Jhikargachha town.

Household size

It seems family planning concepts are well established in the town because according to population census 2011, about 63.4% households are comprised of 2 to 4 no. of members while about 7.9% households are comprised of 7 to 8 members or more. The average household size in the Paurashava is 4.1, which is lower than the national average of 4.5.

Small Number of Migrated Families

In the town 86.13% households were found to be the permanent living there since birth, while 13.87% migrated to the town from various places, mostly from of greater Jessore and Satkhira region. Low level of employment opportunities is the major reason for low rate of migration.

High Income Level

Field survey shows that major percentage of households' income in Jhikargachha Paurashava (68.23%) fall within the income range between 3501 to 8000 Tk. Of the surveyed households 9.17% have monthly income of Tk. 3500 and below that is these households are living below poverty level.

Higher Education Rate but Low level of Education

Literacy rate in the town have been found 83.07% among 6+ years of population, but over 63.76% of the surveyed households have education up to secondary level. It indicates high rate of drop outs at the lower tier of education. Poverty seems to be the main reason for high level of drop outs at the lower level.

High Dependency Rate

Jhikargachha Paurashava has a higher rate of dependency. Socio-economic survey shows 52.13% of the people are engaged in formal earning activities such as government employees, teaching, large and small business etc. while about 9.62% are fully unemployed. Though housewives (2.24%) are not unemployed, but they are anyhow dependent on their earning males.

Part A: Structure Plan**Work Force**

There is 63.40% of total population of the Paurashava belongs to working group with their age between 15 to 59 years. Major share (28.9%) of the working age population fall into the age group of 30 to 49

3.2.2 Economy

Economy is the lifeblood of any urban centre. Higher the economic activity, higher will be the level of employment and income and the consequent physical growth. So, before going for a development plan, it is necessary assess the current level, constraint and prospects of economic activities of the Paurashava. The principle criteria to judge the economy of an urban centre is to learn about its main sources of employment. Besides, the number of productive enterprises and tertiary level activities are also good indicators of the pattern and level of economic activities in any area.

It is revealed from the sample survey among the income earners that about 5.37% are involved in farming/agriculture activities while 62.24% of the paurashava area is under agriculture. So a major portion of the people is engaged on agriculture for their livelihood. About 10.51% are engaged in public and private sector services and 34.23% are engaged in small business activities. About 0.45% people are unskilled labors where 6.49% are involved in large business and 9.62% are unemployed. One of the most important income sources is foreign remittance, though it has not been clearly revealed from the household survey. That's why many of the people have higher purchasing capacity.

So, the current economic picture of the Paurashava is not very bright in respect of economy. Virtually no manufacturing establishment has been found in the town that can contribute either employment or cause production leading to expansion of the non-basic sector of the economy. Poverty haunts over one third of its population and service sector activities is far less than momentum. There is extremely low level of investment, no basic industry that could boost local economy and employment. Investment is pulled by nearby larger growth centers like, Jessore and Satkhira district towns. However, non-availability of infrastructure and urban amenities also discourage investment in this small town.

3.2.3. Industry

Except some small scale processing units there is virtually no manufacturing and medium scale industry, as such, in the Paurashava. The town actually has no industrial base. The **Table-3.1** below shows the situation of industrial sector in Jhikargachha Paurashava.

Table 3.1: Distribution of Industrial Structures in the Paurashava

Ward No.	Pucca		Semi-pucca		Katcha		Total	
	No.	%	No.	%	No.	%	No.	%
1	1	5.00	5	15.15	6	20.69	12	14.63
3	11	55.00	12	36.36	12	41.38	35	42.68
4	0	0.00	0	0.00	1	3.45	1	1.22
5	3	15.00	5	15.15	3	10.34	11	13.41
6	5	25.00	8	24.24	1	3.45	14	17.07
7	0	0.00	0	0.00	1	3.45	1	1.22

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Ward No.	Pucca		Semi-pucca		Katcha		Total	
	No.	%	No.	%	No.	%	No.	%
8	0	0.00	3	9.09	4	13.79	7	8.54
9	0	0.00	0	0.00	1	3.45	1	1.22
Total	20	100.00	33	100.00	29	100.00	82	100.00
%	24.39		40.24		35.37		100.00	

Source: Physical Feature Survey, 2010.

3.2.4. Commerce

The commercial activities in the town are dominated by retail business. The retailers mostly collect their goods from Jessore, which is the largest wholesale market in the region. Because of higher level of affordability of a section of the local people, the general shop retailers keep almost all kinds of consumer's goods in their shops.

Major part of trade and commerce of the study area is conducted through hat/bazar where agriculture produces, consumer items, merchandise for household and other farm and non-farm items are traded. The market / bazar performs significant role in 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. The main market / bazar of the town remain open everyday from morning to evening. Along with the daily business transactions, one market place is 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 are the key supply centre of all sorts of agro-products to the town and other non-producing areas of the region. It is also the major distribution centre of industrial products to the rural hinterland of the region.

That hat / bazar is taking place in the core part of the Paurashava along the main road. Bazar and *hat* runs in tin-shed semi-pucca structures with parcels of open lands. Sunday and Thursday of a week are the local *hat* days. The hat / bazar are prominent due to availability of agro-product and fish to meet the daily needs of the people.

3.2.5 Agriculture

In Jhikargachha Paurashava 5.37% of the male income earners are engaged in farming occupation. Besides, though 62.24% of the Paurashava land is under agriculture. It indicates that the Paurashava is yet to be adequately urbanized. The farmers and farm laborers work in farm lands, both, within and outside the Paurashava. The farmers collect their farm inputs like, fertilizer, pesticides, and irrigation appliances from stores within the Paurashava. For additional purchase they move to Jessore, where there are higher level markets for varieties of goods and about one and a half hour journey from the town. The farmers mostly produce Boro and Aman rice and vegetables. Other farm outputs are livestock, forestry and fisheries. There are about 20 numbers of small scale poultry farms in the town that produce poultry and meat to meet the local demand. Vegetables are mostly consumed by the local consumers, while surplus is sold to the *Beparies* (large businessman) who sell them to the whole sellers and *Chatal* owners.

Part A: Structure Plan**3.2.6 Occupation and Employment**

The unemployment rate is 9.62% in Jhikargachha Paurashava. Only 5.6% of the females have been found engaged in income earning activities. Among the income earners, 40.723% are engaged in business, 5.37% are farmer and 19.02% are skilled and unskilled day laborer. Table 3.2 shows a detail picture of main occupations of the household heads.

Table 3.2 Percentages of the Main Occupation of the Head of Households

Occupation Type	Ward No.								
	1	2	3	4	5	6	7	8	9
Govt. officer	2.70	3.23	5.63	5.08	8.47	1.43	8.70	0.00	6.25
Other govt. employee	5.41	6.45	5.63	10.17	1.69	0.00	0.00	0.00	0.00
Teaching	5.41	3.23	2.82	3.39	1.69	0.00	4.35	0.00	6.25
Farming/ Agriculture	2.70	0.00	4.23	0.00	0.00	10.00	17.39	0.00	25.00
Housewife	4.05	0.00	4.23	0.00	1.69	2.86	0.00	4.76	0.00
Large business	13.51	6.45	7.04	8.47	8.47	0.00	4.35	0.00	0.00
Small business	36.49	51.61	28.17	49.15	44.07	22.86	28.26	28.57	0.00
Private service	1.35	0.00	4.23	3.39	6.78	15.71	6.52	14.29	18.75
Skilled labor	0.00	0.00	0.00	0.00	3.39	7.14	0.00	14.29	0.00
Unskilled labor	22.97	29.03	33.80	6.78	8.47	15.71	15.22	4.76	31.25
Rickshaw/ Van puller/ Driver	2.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unemployed/Retired	1.35	0.00	0.00	8.47	0.00	4.29	4.35	0.00	6.25
Total	1.35	0.00	4.23	5.08	15.25	20.00	10.87	33.33	6.25

Source: Household survey conducted by the Consultant, 2008.

The existing employment pattern shows a bias towards trading. Since secondary sector employment is highly lacking in the town, people move to self employment like trading. Trading has been found feasible employment in the town, mainly, because higher level of affordability of the people. Remittance is the source of income of a large segment of the town families. The employment scenario of the Paurashava is unlikely to change shortly unless there is any major investment in the industrial sector that can pool a large number of workers and bring vibrancy to the local economy.

3.2.7 Informal Sector Economic Activities

Informal sector characteristics are very similar in all over urban Bangladesh. It is more prominent where there is concentration of people is more. Informal sector is a part and parcel of urban economy of all developing countries. The most important feature of informal sector is, the sellers carry their goods and services to the buyers and their concentration is more where agglomeration of buyers is more.

Informal sector covers a variety of activities which may be broadly classified as Trading and Services. In various type of mobile or fixed shops they sale 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. These income earning activities are considered as informal economic activities.

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In the Paurashava, informal entrepreneurs mainly perform their business in the market / bazars and areas where there is agglomeration of people. In informal sector females are hardly visible. 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 have been adopted by the informal entrepreneurs in the Paurashava. Of the various occupations, trade occupies the dominating role. It 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 small business shared by about 47% of the total employment, followed by service, agriculture and food processing. They employ very entrepreneurs employ small capital and are usually self-employed.

About 31% respondents monthly earning is in the range of Tk. 3000 to Tk. 6000 and 1.8% is Tk. 2000 to Tk. 3000. A considerable (11%) entrepreneurs has monthly income is above Tk. 20000.

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

In Jhikargachha the concentration of informal entrepreneurs is found more around the bazar area, transport terminal and bus stoppage areas and around major shopping centers.

3.2.8 Physical Infrastructure

3.2.8.1 Existing Road Network

Jhikargachha Paurashava is a very small Paurashava (**only 11.09 sq. km.**) according to the Gazette Notification). Physical growth of Jhikargachha Paurashava town is generally dictated by the road pattern of the Paurashava. . A major road (Benapole road) passes through north-western to south-east towards Benapole Port town while Kopotakkho River passes through north to south. This Benapole road and Kapotakkho river intersects each other and divides the city into 4 parts. There is great scope of physical growth through the road system of the Paurashava. A number of major roads pass through the town to different urban centers including district headquarters. Major roads that pass through the heart of the town form two major intersections at the Upazila More and Thana More.

Table 3.3: Road network information

Sl no.	Road Name	Direction	Type	Length(km)	Width (m)
1	Jessore Benapol Highway	Jhikargachha to Benapol	Pucca	4.25	6.15
2	Kirtipur Road	To Kirtipur	Pucca	1.68	2.76
3	Hospital Road	To Hospital	Pucca	0.42	3.60
4	Chougachha Road	Jhikargachha to Chougachha	Pucca	1.25	3.05
5	Upazila Road	To Upazila	Pucca	0.67	4.28
6	Sreerampur Road	To Sreerampur	Pucca	1.53	3.66

Source: Physical Feature Survey by DDC, 2009-2010

Inter-regional linkages include national highway, regional highway, primary road, secondary road, tertiary road, local road, access road, feeder road, walk way, etc. This land use also includes

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establishments to accommodate all transport and communication facilities such as bus terminal / stoppage, truck terminal, CNG/Rickshaw stand, Passenger Shed, boat ghat, etc.

According to field survey, the length of total roads in the Paurashava is 74.079 km with 37.88 km of pucca road, 23.32 km of semi-pucca road and 12.86 km of katcha road. Besides, the Paurashava has a total of 92 bridge and culverts.

Roads and Highways (R&H) Roads

The Paurashava has about 4.25 km of roads within the town which owned and maintained by the Roads and Highways Department (RHD) which is named by Jessore-Benapole highway. This road passes through north-western to south-eastern side. The crests of this road have varying widths of 12 ft. to 18 ft., while the right of way ranges from 20 ft. to 36 ft.

Important Local Roads

The Paurashava has so far developed 80.64 km of roads within its area with different width. They are also responsible for maintaining the roads. The Paurashava has named many of these roads after renowned local personalities.

Table 3.4: Important Paurashava Roads

Name of the Road	Road Type	Road Length (Km)
Kirtipur Road	Pucca	1.68
Hospital Road	Pucca	0.42
Chougachha Road	Pucca	1.25

Source: Physical feature survey, 2010

Map no. 3.1: Circulation Network of Jhikargachha Paurashava

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3.2.8.2 Traffic Mode and Infrastructure

Bus Terminal

There is no formal bus terminal/stand at Jhikargachha from which the buses start for different destinations. Generally buses pass through Jessore-Benapole highway. Jessore is the nearest busiest Paurashava from Jhikargachha and generally buses stop at there. That's why without the Jhikargachha Bazar area, in the whole Paurashava the traffic congestion problem is not severe. Buses generally go to Monirampur, Satkhira, Benapole passing through Jhikargachha Paurashava.

Truck Terminal

As a small town, the economic activity is very low in Jhikargachha Paurashava. As Benapole port is the biggest land port in Bangladesh which is situated just only about 40 km. away from the town. Imported goods and commodities from Benapole port are carried mainly by truck. So transportation business based on truck is well established here in Jhikargachha. But there is no permanent truck terminal in this town. In the Jessore Benapole highway, the trucks are parked often and so congestion is a regular scenario in this town.

Tempo Stand

There is no formal CNG or Rickshaw stand in Jhikargachha for keeping the vehicles. Rickshaws generally stand here and there of the Paurashava. CNG drivers generally put their vehicles in two places as temporary stand: at zero point and in front of Jhikargachha rest house. That's why these areas become the busiest places of Jhikargachha.

3.2.8.3 Parking

As the town does not have large number of traffic so the local government did not feel it necessary to reserve parking space. There no formal parking reserves for non-motorized transports a well. However, tempo and baby taxis are informally parked in particular areas.

3.2.8.4 Footpath

The town does not have any footpath anywhere. In small towns like, Jhikargachha, footpaths are usually absent, as it is given least priority in development activities.

3.2.8.5 Waterway

As there is a river within Jhikargachha Paurashava named Kapatakkha but this river has lost its navigability, so there is no formal waterway transportation in Jhikargachha.

3.2.8.6 Drainage System

The drainage system in the study area can be classified into two types. One is the **Natural Drainage** system that has emerged as a natural process following the natural slope of the ground, for the movement of storm run-off. The flow moves from high to low lying areas. The other is the **Man-made Drainage** system that is provided by the municipal authority or any other local government to drain out the domestic waste water or storm water from the urban area.

Natural Drainage Network

Kapatakkha River acts as the main natural drainage network of the town which has a total length of 3286.35 meters and area covers 50.61 acres. The other main natural drainage network is the Kata khal passes through north-western side of the town and get joined with Kapatakkha River at

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eastern side of the town. The total length of the khal is 1951.92 meters and total area is 12.053 acres. Apart from the natural drainage system, there are 263 numbers of ponds, khals and ditches in the Paurashava. Unplanned spatial development activities and growth of rapid settlements due to rapid population growth are causing encroachment on these water bodies, water courses and natural drainage paths. These unplanned development activities are creating obstacles to natural drainage, reducing retention basins and reducing drainage capacity. Poor drainage capacities of the existing khals and water bodies cause long-lasting flood duration in inland areas and intensify the flood damage and creates ecological imbalance situation.

Man-made Drainage System

Provision of this type of drainage is a part of the activities of municipal authority or any other local government and also donor agencies. Jhikargachha Paurashava is covering an area of about 11.09 sq. km. As a local government body, Jhikargachha Paurashava is responsible to provide drainage system to carry out the domestic as well as storm water. The municipality is also responsible for its operation and maintenance within its jurisdiction.

Tertiary Drain

Tertiary drains are local drains. Tertiary drains cover smaller storm drainage area than primary and secondary drains. In ascending order its position is third. Its cross-section is 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 households. Tertiary drains discharge its drainage water to secondary drains and natural khals.

Secondary Drain

Secondary drains collect discharge from tertiary drains. One secondary drain may receive drainage discharges from several tertiary drains in its course. Size and capacity of secondary drain is bigger than tertiary drains, its catchment area is smaller than primary drains, bigger than tertiary drains. It may run parallel to bigger roads. Secondary drains may run along and through the middle of its storm water contributing area.

Primary Drain

Primary drains carry run-off or storm water to the destination. Their catchment area or storm water contributing area is bigger than Mohallah drains. In most municipal areas or even in Dhaka City Corporation it is difficult to find such naming or classifications. However such classifications can be seen in reference books. Primary drains generally are the under jurisdiction of municipality and city corporation. These drains or drainage networks are constructed and maintained directly by municipalities and City Corporation. These drains are constructed by brick, cement concrete and sometimes by excavating earth in their alignments. Sometimes borrow pits of the road serves as drains provided borrow pits are uniformly and continuously excavated. Primary drains deliver its discharge usually to secondary drains.

Man Made Drainage System in Jhikargachha Paurashava at a Glance

- Length of constructed drainage system
 - Pucca : 18.22 km
 - Katcha : 0.11 km
- Number of ponds/ditches : 263 Area: 89.30 Acres

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- Natural drainage system : 6.30 Acres

Outfall of Drains

There is no formal outfall of drains in the study area. The primary drains mainly discharge storm/waste water to the nearby Kapatakkha River and the Kata khal and boro pits along the road. Through the physical infrastructure survey and extensive field observation the consultant has identified outlets to the Kata Khal and Kapatakkha River that pass as spider web through the Paurashava. Most of the katcha drains are close ended and without any outlet causes overflows in the road during monsoon.

Capacity and Gravity

Capacity and gravity of these drainage channels are not sufficient to carry out the excessive rainwater that usually occurs in this locality during monsoon. Besides, inadequate drainage sections in conventional drainage system, absence of inlets and outlets, indefinite drainage outlets, lack of proper maintenance of existing drainage system, hampers the natural flow of water. Therefore, water remains stagnant in many roads and build-up areas creating water logging. Through the physical infrastructure survey and extensive field observation the consultant has

3.2.9 Demographic Characteristics**Population**

This section of the Report contains the analysis of demographic elements of the Paurashava based on the socio-economic sample survey and population data from census reports and other sources. **Table- 3.5** Gives the ward-wise population distribution of the study area with data from the last two population censuses.

Table 3.5: Population Distribution

Ward No.	Population / Census Year				
	2001	2011 (Projected)	Area in Sq. km.	Area in Acres	Density (2011)
1	4234	5105	1.99	491.69	10.38
2	1713	2096	0.08	19.84	105.65
3	4123	4400	0.36	89.49	49.17
4	3077	3968	0.34	83.75	47.38
5	2953	3277	1.84	455.64	7.19
6	3726	4600	1.18	290.78	15.82
7	4537	2669	1.39	343.90	7.76
8	2176	2850	1.14	281.99	10.11
9	1295	3809	2.75	680.32	5.60
Total	27834	32774	11.08	2737.41	11.97

Source: National Population Census, 2001 and projection.

Age and Sex Structure

According to BBS 2001, combined age-group 0-9 comprises 21.3% and the age-group 10-17 years comprises the 19.25% of the total population of the Paurashava. The age-group 18-34 shows 32.20%, of which 15.01% are male and 17.19% are the female of total population. The age-group 35-59 is another group to be mentioned here which comprises the 21.84% of which 12.28%

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are male and the 9.55% are the female. The population above 60 years is found to comparatively lower constitute only 5.41% of the population of the Paurashava.

Household Size

According to 2011 Population Census the average household size in Jhikargachha Paurashava was 4.1. According to household survey, it has been found that in 78.2% households, the family size vary within 3 to 6 members. Only 3.9% families have 8 and above members.

Marital Status

In the Paurashava 23.1% male and 35.1% female population of age 10 years and over was never married. In the same age group percentage of married male and female were 64.1% and 67.0% respectively. Percentage of widowed and divorced male was 0.6% and 0.2% respectively and percentage of widowed and divorced female was 8.4% and 1.5% respectively. (BBS, 2011)

Population Growth Rate

According to BBS, Population Census 2001, Growth rate of urban area in Bangladesh was 4.2% and total Urban Population was 28.8 million. Jhikargachha Paurashava comparatively is newly formed Paurashava which attained its Paurashava status about 14 years. In the year 2011 the growth rate of Jhikargachha Upazila area was 0.97%. Growth rate of Jhikargachha Paurashava has been calculated from population data of year 2001 & 2011, which is 1.65%.

Population Density

The population density for the entire country was approximately 755 people per square kilometer in 1991, and increased to 834 people per square kilometer in 2001. Population density of the Paurashava area is found 2487/ sq. km in the year 2011 where it was 2112/ sq. km in the year 2001. The highest density exists in Ward No. 2 and then lowest is found in the Ward No. 7.

Migration Pattern: Duration of Stay in the Town

Migration is one of the most important aspects for analyzing the demographic pattern of any place. From the socio economic survey 13.87% of the surveyed population in Jhikargachha Paurashava found to be migrants. Out of the total migrated people, most have migrated within the same Upazila. Only small percentage of the total migrated population reported to have migrated in the Paurashava from other districts. This reflects that still no such economic activities have been developed in this Paurashava to attract people from other places. Maximum migrated household settled in the Core area of the Paurashava.

Education

According to the BBS report 2011 school attendance in the Paurashava was 83.07% for both sexes with 41.76% for male and 41.31% for female in the age group 6 to 10 years, 83.85% for both sexes with 40.35% for male and 43.50% for female in the age group 11 to 14 years and 32.04% for both sexes with 15.46% for male and 16.58% for female in the age group 15 to 24 years.

The educational status of the household head is quite satisfactory as observed from the Household Survey. The overall percentage of illiterate household head as observed from the survey had been 13.87%. Percentage of SSC/equivalent is (12.53%). Women are lagging behind in respect of education in all the levels. Table 5.4 shows the educational status of Jhikargachha Paurashava.

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Religion

According to latest population census report (2011), 92.36% of the population of this Paurashava belongs to Muslim community, 7.58% to Hindu community and 0.05% to Christian community. Population belonging to other religion such as Buddhist and Christian are very insignificant in number.

Income of the Households

The income and the expenditure pattern of an area is the index of the socio-economic status of that area. The data collected through household survey shows that most of the households fall in the low to lower middle income group. About 68.23% of the total surveyed household is in the income level BDT 3501-8000 which is the highest share of percentage. The income level BDT 8001-13000 comprises second highest percentage (14.09%) of the households in the Paurashava.

3.2.10 Paurashava Institutional Capacity

3.2.10.1 Human Resource Management: Allocated Manpower/Organogram

Jhikargachha is a “B” class Paurashava. According to Paurashava manual as a ‘B’ class paurashava, there should have been 70 staff in Paurashava to manage the engineering, administrative, health, family planning, conservancy works. In this organogram Mayor is in top position. Chief Executive Officer (CEO) will coordinate the three major divisions. These divisions are Engineering division (Headed by Assistant Engineer), Administrative division (Headed by Secretary), Conservancy, health and family planning division (Headed by Health Officer). In this organogram both full time and contractual official will be engaged.

Existing Manpower of the Paurashava

Jhikargachha Paurashava is suffering from lack of manpower to conduct the municipal activities efficiently. It is a class ‘B’ Paurashava. Government sanctioned manpower of ‘B’ class Paurashava is as shown in Figure 13.5.1 but the actual manpower working in the Jhikargachha Paurashava is far below the sanctioned manpower. The existing manpower of the Paurashava is shown in Figure 13.1. The important posts lying vacant are the Posts of Chief Engineer, Chief Accounts Officer; there is no option for the post of Town planner. Though a standard ‘B’ class Paurashava comprises of 32 personnel in Engineering Department, but Jhikargachha Paurashava has to depend on 13 personnel in Engineering Department. Again in the administrative section the Paurashava has to depend on only 14 personnel for the administrative works. Comparison of proposed manpower and existing manpower scenario of the Paurashava have been shown in the following table.

Part A: Structure Plan**Table 3.6: Existing Manpower of Jhikargachha Paurashava**

No.	Department/ Section/ Designation	Proposed for B class Paurashava	Exists in Jhikargachha Paurashava	Existing Manpower Percentage (%)
Engineering Department		32	13	40.63
1	Executive Engineer	1	0	0.00
2	Asst. Engineer	1	1	100.00
3	Sub- Asst. Engineer	3	1	33.33
4	Other Staffs	27	11	40.74
Administrative Department		74	14	18.92
5	Secretary	1	1	100.00
General Section		14	3	21.43
6	Administrative Officer	1	0	0.00
7	Head Assistant	1	1	100.00
8	Other Staffs	12	2	16.67
Accounts Section		4	3	75.00
9	Accounts Officer	1	1	100.00
10	Accounts Assistant	1	0	0.00
11	Other Staffs	2	2	100.00
Assessment Section		3	2	66.67
12	Assessor (Tax)	1	0	0.00
13	Assistant Assessor	1	1	100.00
14	M.L.S.S	1	1	100.00
Tax Collection/ Bazar Section		10	3	30.00
15	Tax Collector	1	1	100.00
16	License Inspector	1	1	100.00
17	Asst Collector	6	1	16.67
18	Other Staffs	2	0	0.00
Market Inspection Section		3	2	66.67
19	Market Inspector	1	1	100.00
20	Collector	1	1	100.00
Education/ Cultural/ Library Section		18	0	0.00
21	Education and cultural Officer	1	0	0.00
22	Librarian	1	0	0.00
23	Teacher	10	0	0.00
24	Other Staffs	6	0	0.00
Health, Family Planning and Sanitary Department		22	6	27.27
25	Health Officer	1	0	0.00
26	Conservancy Inspector	2	1	50.00
27	Sanitary Inspector	1	1	100.00
28	Health Assistant	2	1	50.00
29	Vaccination Supervisor	1	1	100.00
30	Booster	6	0	0.00
31	Other Staffs	9	2	22.22

Source: Jhikargachha Paurashava, 2012

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As a traditional system, engineers and secretary are appointed directly by the Ministry of Local Government and other staffs are appointed locally by the Paurashava through the approval of the Ministry. Due to low revenue income it is not capable to pay the salary to all the officials and staffs. The salary paid from the government grant and BMDF allocation.

3.2.10.2 Paurashava Town Planning Capacity

At present, the Paurashava has no town planning section or any appropriate manpower to prepare or implement town plan. It is recommended to create a Town Planning Section in the organogram directly under the Mayor. There can be one Chief Town Planner equivalent to the Chief Engineer, supported by two Deputy Town Planner and four Assistant Planners plus other necessary support staff. The section will be equipped with necessary computer and other logistics. The responsibility of the Town Planning Section will be to oversee and monitor development control, environment, monitor development, identify Paurashava problems and opportunities for development and solve problems, monitor master plan implementation. Prepare new development projects and conduct research on issues and problems.

The proposed organogram of the Planning cell may be as follows (every section will be supported by other supporting staffs):

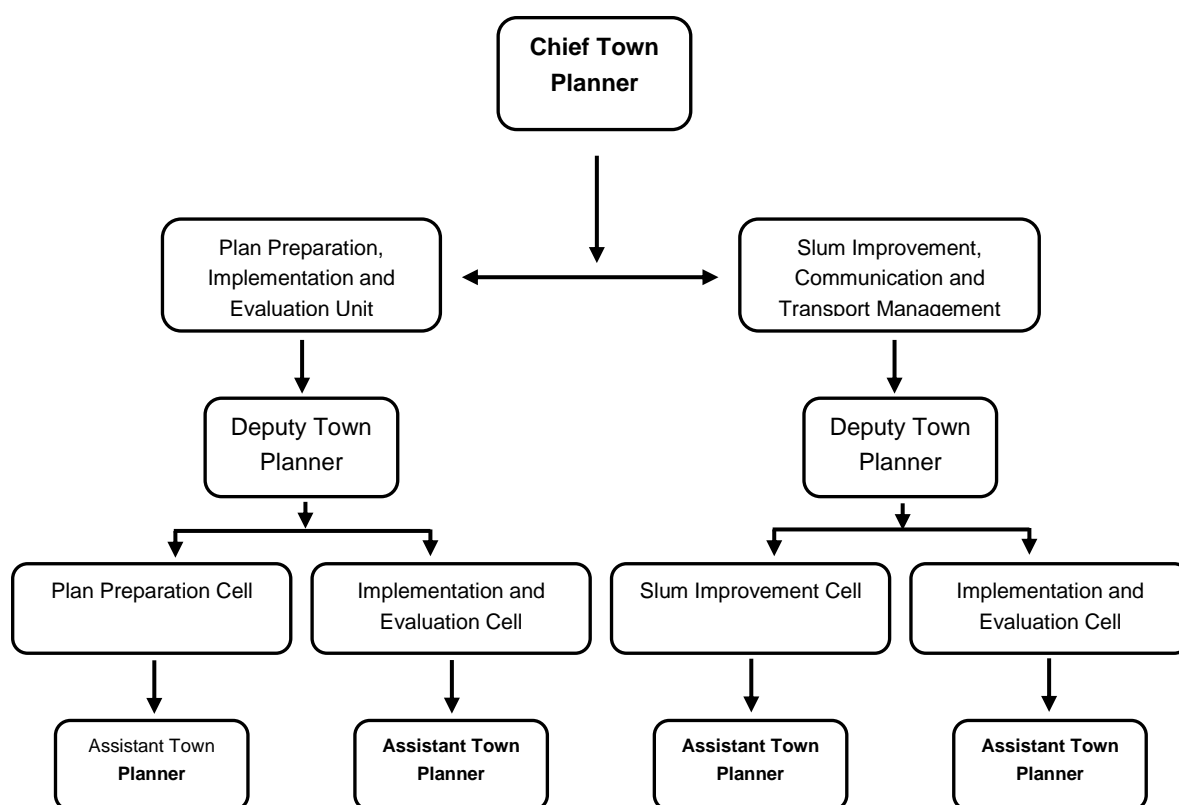


Figure- 3.1: Proposed Organogram of Planning Cell

Paurashava Master Plan Implementation Capacity

The existing capacity of the Paurashava is seriously inadequate to implement the Paurashava Master Plan. The Paurashava must strengthen its capacity to implement its master plan when it

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will be completed. In the previous section a Town Planning Section has been suggested for the Paurashava. Its prime responsibility will be to monitor regularly implementation of the master plan recommendations. It will prepare monthly progress report on master plan implementation and keep aware the Mayor of the latest situation. The section will also explore ideas to implement master plan provision with the participation of the stakeholders. New will need to be generated to implement master plan under PPP.

3.2.10.3 Annual Income

Revenue income of the Paurashava was 5683157.00 taka and 7397780.00 taka only during the financial year of 2011-2012 and 2012-2013 respectively excluding government grant and government fund for development section.

Table 3.7: Revenue income Jhikargachha Paurashava

Taxes	2011 - 2012		2012 - 2013	
	Income	%	Income	%
Holding Tax	2931257.00	51.58	4275680.00	57.80
Tax on immovable property transfer	1680500.00	29.57	1800000.00	24.33
Building Construction Tax	265800.00	4.68	260000.00	3.51
Tax on Professionals, Business	580000.00	10.21	730000.00	9.87
Advertisement	180000.00	3.17	255500.00	3.45
Tax on Cinema, Theatre and Audio-visual Show	0.00	0.00	0.00	0.00
Tax from NMT	45600.00	0.80	76600.00	1.04
Birth & Marriage Certificate	0.00	0.00	0.00	0.00
Total	5683157.00	100.00	7397780.00	100.00

Source: Accounts Division, Jhikargachha Paurashava, 2012.

This amount of resources does not allow the Paurashava to achieve its targets of development. As a result the authority has to depend on government grant which is also meager in amount and very competitive.

3.2.11 Urban Growth Area

It is evident from the land use survey that about 62.24% of the Paurashava area is still under agricultural land use. Actually, it has a built up area of 30.04%. The total population was only 27834 in 2001. However, growth rate in 2001 was 1.65%. The estimated population of the Paurashava in 2011 was 32774.

Physical Growth and Directions

Accessibility is an important influencing spatial factor to analyze the growth factor. Another two important factors are flood free high land and existing urban area. Land price signifies how housing structures can be easily produced and, thus, should be supplied elastically to the market. Land price of a property is tightly linked with the land, location and the amenities which are associated with the property. Physical growth usually follows these criteria. The direction of physical growth in the town is towards north to south direction along the Chougacha road. The high potential area for future urban growth follows this highway in two opposite directions. Because land elevation and land price both are higher along these major roads. However, minor developments follow the existing urban development in the peripheral areas of the Paurashava.

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3.2.12 Catchment Area

Catchment area of any urban centre is the area over which its influence extends. Study of catchment area requires extra efforts of survey. But since studying catchment area was not a part of the terms of reference, the consultant did not conduct any survey to ascertain the catchment area of the Jhikargachha town. From observation, it is learnt that the zone of influence of such towns do not extend beyond a few kilometers wherefrom people commute to the town to purchase their daily necessities and for administrative, legal and other businesses. The zone of influence of Jhikargachha is very likely to be overlapped because of the proximity of other small towns nearby.

3.2.13 Existing Land Use

From Land Use Survey, total land area of Jhikargachha Paurashava was found to be 2737.41 acres or 11.08 sq. km. Table 4.5 shows the summary of existing land use distribution of the Paurashava. Most dominant land use type in the Paurashava is agriculture which is 57.38% of the total land area. In the Paurashava commercial, administrative and educational land uses are predominantly concentrated in the middle part of the Paurashava (Ward Nos. 3, 4, 5 & 6). North and eastern part of the Paurashava are mainly used for agricultural, religious, graveyard and other purposes. The Paurashava does not have any land belonging to 'Restricted Area', and 'Forest Area' categories.

Residential

Total residential land of Jhikargachha Paurashava is 737.82 acres, which is 26.95% of total area. Ward No. 5 contains the highest amount of residential land use (142.96 acres) where as Ward No. 2 covers the lowest (15.11 acres) of residential lands.

Commercial

Total commercial land of Jhikargachha Paurashava is 30.50 acre, which is 1.11% of total lands of the Paurashava. Ward No. 3 covers 7.05 acres commercial land which is the highest use of land in commercial purposes, where as Ward No. 6 contains 5.77 acres and Ward No. 5 contains 5.33 acres of total commercial land of the Paurashava. Rest of the Wards of this Paurashava contains a very insignificant share of land for commercial uses. Within the Paurashava, Ward No. 2 has the lowest area (0.717 acre) earmarked for commercial use.

Agricultural

Around 1570.78 acres of land of the Paurashava is under agricultural use. It appears from field survey that Ward 9 has maximum agricultural land (526.09 acres), which is 33.49% of the total agricultural land of the Paurashava. There is no agricultural land found in Ward Nos. 3 & 4.

Public Land

This section of the report describes the public land in the Paurashava under various public sector agencies.

Paurashava

Paurashava Office is situated beside Upazila office. Both occupy 4.41 acres which is situated on Paurashava owned land in Jhikargachha Paurashava area.

Part A: Structure Plan**Land under other Govt. Institutions**

Jhikargachha Paurashava office, UNO office, Food office, Sub-Register office, Upazila Primary and Secondary Education office, Water Development Board, Rural Development Board and other government offices are included in this category of land use. Mostly this type of land use is found in Ward 4 (35.38%) then comes Ward 8 (29.04%).

Khas land

The detail list of Khas land is not yet received from the Land office of Jhikargachha Paurashava.

Other (Abandoned etc.)

There is no other or abandoned categories of lands exist in Jhikargachha Paurashava.

3.2.14 Paurashava's Functional Linkage with the Regional and National Network**Regional Network**

The Paurashava itself and its citizens are functionally linked with regional and national activities in many ways. This linkage is operated by means of direct communication and through different media. The Jessore Benapole Road runs through the Paurashava and links a number of Connector and Access Roads. This Highway is the major arterial road of the study area. It provides connection with Benapole at east and Jessore sadar at west directly.

Motorized and non-motorized vehicles are operated in all the nodes of the study area. The non-motorized vehicles are mainly operated within short distance and meet the local needs. The motorized vehicles are mostly local passenger buses and local popular CNG operated autos and human halers.

The relationships are there in government services and private sector activities. There are many public sector agencies at the Upazila level under different ministries. These offices take instructions from their concerned ministries, either over telephone or by postal services. Similar way the private business and other agencies also maintain their communication with their head offices at Dhaka. For judicial and land related services common people go to the Zila courts at Jessore and land offices at the DC Office.

3.2.15 Role of Agencies for Different Sectoral Activities

Agencies responsible for utility facilities and municipal services are important components for an urban centre that play important roles in local development. Almost all national government ministries have their Upazila level offices that are located in the Upazila headquarters town. The concerned departments / organizations responsible for planning and development of utility services are shown in the following table.

Table 3.8: 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

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All these offices are headed by an officer and staff and they are responsible to execute the development Programmes of the concerned ministries at the grassroots level. They also convey to the head office about the impacts of the Programmes and problems of existing in the field and the problems of programmer operation. Some Upazila offices are controlled by the Zila level offices while some are controlled from the head offices at Dhaka.

The authorities (as presented in the Table-3.8) perform other responsibilities with the assistance and support of other relevant government agencies. The functions discharged by agencies 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.

3.3 Development Problems of the Paurashava

3.3.1 Physical Infrastructure Problems

Road and Transportation Problems

As any other town, Jhikargachha has its own road and transportation problems. These problems have been identified from two different sources-first, by reconnaissance survey of the town, field observation, passenger and operator interview and the by means of household sample survey.

Traffic Conflict

Traffic conflict is common and frequent in towns where there is admixture of transport vehicles-slow and fast-in the streets. Areas of conflict occur at point where there intensity of traffic movement is high. These are Upazila More Intersection, Chougacha intersection etc. The identified reasons for traffic conflict are, improper intersection design, parking of vehicles on the street, waiting of operators on the roads looking for possible passengers, absence of traffic signal, disobedience of traffic rules etc.

Road Accident

Mentionable accidents were not found recently in Jhikargachha. Occurrence of minor accidents has been found. Local police station and Upazila Health Complex could not provide any statistical information about road accident.

Narrow Road Width

Broken road and narrow widths of roads have marked by most respondents as major road problems in the town. About 11% of the respondents have pointed to 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 town grows and density of population increases in future. As field survey shows, 30.87% of the households of the town reported that the road widths in front of their houses are 8 ft. or less. This is alarming, as there will be increase in population leading to higher density.

Part A: Structure Plan

This will cause traffic on the street to rise that will create serious traffic congestion on the narrow streets. There is little chance that the authority will be able to increase the road width in highly built up areas- especially at the crossing points of main bazaar area, as there will be high cost involvement and social-pressure on any attempt to demolition will be very high.

3.3.2 Socio-economic Problems

The Jhikargachha Paurashava suffers from a number of socio-economic problems. Important of them are highlighted below.

Low level of Education

The survey findings show that over 49.89% of the surveyed households have education up to secondary level but 12.53% of the surveyed households have education up to SSC level. It indicates high level of drop outs at the lower tier of education.

High Dependency Rate

Jhikargachha Paurashava has a high level of dependency rate. Socio-economic survey shows that only about 38% of the people are engaged in formal earning activities. These activities are likely, Government/Autonomous, Private Company, Self employed, Business, NGO Person, Skilled Labor, Labor, Driver, Rickshaw/Van Pullar, Household worker, Day Labor (Agri), Farmer (Land Lord), Farmer (Land Less), Day Labor (Non-agri) and Others. Fully unemployed persons are of 12.32%. Though housewives are not unemployed, but they are actually dependent with our socio-cultural perspective and it is a significant 22.39%. Students are of 27.03% which is also dependent. As a whole, there are about 61.74% of people who are directly or indirectly dependent.

Low level of Working Force

There is about 38.26% of total population who are belongs to working group as per working force between 16 to 55 age at Jhikargachha Paurashava and remaining about 61.74% of population lies under nonworking group. The actual percentage of working people is about only 38% of the total existing population.

Urban Poverty

Still the majority of the town population lives under poverty. They suffer from acute scarcity of employment due to lack of non-farm economic activities. Population of the town is also not enough to serve as a base for informal sector economic activities. As a result staggering poverty continues in the town.

Active and Passive Recreation Facilities

The Paurashava has no public play field and recreational park to facilitate outdoor recreation of the Paurashava people, particularly the young and the juvenile. The existing playgrounds are generally used as school playground.

3.3.3 Environmental Issues

Drainage Management Problems

The condition of drainage service in the Paurashava Centre is very much dismal. These drains are not properly connected. The result is pool of stagnant water found almost everywhere. Few pucca drains has been constructed in the Paurashava Headquarters, especially adjacent of Bazar area. Jhikargachha Paurashava suffers from the shortfall of funding to provide sufficient drainage

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system as well as its proper operation and maintenance. Only 21 staff including 20 contractual are engaged in its conservancy division for street sweeping, solid waste collection, cleaning and maintenance of drainage system. But due to the lack of equipments they are unable to do cleaning and maintenance. Negligence of duties/responsibilities of staff is another major problem for the drainage system.

Waste Management

Jhikargachha Paurashava has conservancy department to manage the solid waste like other Paurashavas. The Paurashava has only 5 dustbins though these are broken and not usable. Production of solid waste is low due to low volume of population. It was reported and proved that, the authority did not maintain formal dumping system. A portion of the waste is dumped on the canal beside the road. This practice has created blockage of the canals at several points. The authority only collects wastes from road sides and dustbins. Door to door collection system has not yet been introduced in this Paurashava.

Water Sources and Pollution

- Number of ponds/ditches : 267 Area: 89.30 Acres

The number of ponds is approximately 267 with area of 89.30 acres, which serve as important sources of water supply for the local inhabitants. There is one canal namely, Kata Khal, a significant portion of which have illegally been encroached by the influential persons. At many points the canal has been blocked by the unauthorized and unplanned waste dumping. Ground water level in Jhikargachha Paurashava is found between 40 ft to 50 ft during dry season and between 30 ft to 35 ft during wet season. Ground water contains Iron and Arsenic (Source: DPHE, Jhikargachha, 2009). One of Paurashava sources reported that, nearly 60% of the tube wells are arsenic contaminated and the provision of deep tube well is not possible because of the presence of salinity in the ground water. The sources of surface water (ponds and ditches only) are polluted by domestic waste, unhealthy sanitation and extensive use of fertilizer in the agriculture production. Soon, water supply is going to be very critical in the Paurashava. To restore water supply blockages and encroachment of canals must be removed and the canals must be allowed to accommodate water. Water supply problem can be substantially resolved by properly using the existing khals.

Air Pollution

Air pollution is the introduction of chemicals, particulate matter, or biological materials that cause harm or discomfort to human or other living organisms, or damages the natural environment, into the atmosphere.

Operations of shallow engine driven vehicles (Alam Sadhu/ Nochiman/ Kariman) that are unfriendly to the environment are responsible for air pollution due to, these vehicles uses 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, nose and throat. Long-term exposures can lead to chronic, more serious health problems such as cardiovascular disease, cardiopulmonary disease, and lung cancer.

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There are 13 rice/flour husking mills and a sugar mill located within the Paurashava area. Rice mills releases dust as effluent into the air and polluting the surroundings.

The rice husking mills used to boil rice 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. These mills have not installed any effluent treatment plant. The Paurashava authority has been not yet taken any initiatives to install treatment plant in the industry.

Land Pollution

Noise pollution basically consists of unpleasant human, animal or machines creating sound that disrupt the activity or balance of human or animal life. A common form of noise pollution is from vehicles, 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 Nochiman/ Kariman are plying on roads as a mean of local transport. They are making more than 200 trips per day throughout the Paurashava. Engine generated sounds during their operational time on roads is both a matter of nuisance as well as a source of sound pollution. The Paurashava authority has been already served notice to restrict their movements. Generated sounds from Saw mills at their operational time are also a source of sound pollution existing in Jhikargachha Paurashava. In this respect there is no measures have been taken either by Paurashava or by any Public or Private agency.

Noise Pollution

Land 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.

In the Paurashava, land pollution is occurring from extensive use of fertilizer in the 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. In 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.

The entire Paurashava is affected. There is no attempt to curb this pollution from either by Paurashava or from other agency.

Diseases

The common diseases of the inhabitants in this Paurashava are usually the seasonal diseases. From the over all survey findings it has been revealed that the inhabitants of the Paurashava do not face any severe environmental problem.

Map no. 3.2: Location of water bodies including drainage network

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Chapter 4

Projection of Future Growth by 2031

4.1 Introduction

Perhaps no single factor is more important for planning than the size and composition of population and the way it will change in the future. Estimating future population for a specific period for a particular area is one of the most difficult tasks in the planning process. For Bangladesh population projection is a very difficult task as the required data are not available for particular area and it is same in case of Jhikargachha.

The population figures collected from secondary sources, especially for Paurashava were very much ambiguous. So, for the final projection, several discussions were made with experts and BBS officials. Following the annual growth rate for the study area available from the 2001 Population Census, the projection up to the year 2031, with five years interval has been made.

The data gathered from the several sources were arranged in different formats according to their requirement and analysis. So, comparison of data between different sources is very difficult when it is calculated for the projection the output show different results.

Migration information is not available in population census by BBS. It only considers the natural growth rate. But actual population projection requires both natural growth rate and migration rate. For unavailability of migration rate, population projection becomes very difficult. To avoid this problem, an alternative population projection method has been used as stated below.

4.2 Projection of Population

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

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

Where,

r = annual rate of growth

P_n = population in the target year

P_o = population in the base year

n = number of intermediary years

During the period 2001 to 2011, the population growth rate of Jessore District was 1.11 in the urban area as against 0.89 in the entire district irrespective of urban and rural area. In the urban area of Jhikargachha Upazila, the growth rate was 1.65 as against 0.97 for the entire Upazila during the same period. However, a comparative growth rate at the regional and local level is presented in Table-4.1.

Part A: Structure Plan**Table- 4.1: Comparative regional and local growth rates**

Administrative Unit		Growth Rate
Jessore District	District	0.89
	Urban	1.11
Jhikargachha Upazila	Upazila	0.97
	Paurashava	1.65 (Calculated from population data of 2001 & 2011)

Source: BBS, 2011

The growth rate of Jhikargachha Paurashava (0.89 as urban growth rate) found from BBS, 2001 & 2011 has been used for population projection. This growth rate has been adopted to estimate the projected population at 5 years interval up to 2031 and presented in Table-4.2.

Table-4.2: Projected Population of Jhikargachha Paurashava

Year	Population
2001	27,834
2011	32,774
2016	35569
2021	38591
2026	41893
2031	45438

The calculation of projected population for the year 2031 is given below:

$$\text{Population (Year 2031)} = 32774(1+1.65/100)^{20} = 45438$$

The population of each ward at Jhikargachha Paurashava is estimated assuming 1.65 as annual growth rate. Details are provided in following Table-4.3.

Table 4.3: Population Projection with Density for Jhikargachha Paurashava Up to 2031

Ward No.	Area (In Acre)	Census population		Projected population			
		2001	2011	2016	2021	2026	2031
1	491.69	4234	5105	5540	6011	6525	7078
2	19.84	1713	2096	2275	2468	2679	2906
3	89.49	4123	4400	4775	5181	5624	6100
4	83.75	3077	3968	4306	4672	5072	5501
5	455.64	2953	3277	3556	3859	4189	4543
6	290.78	3726	4600	4992	5416	5880	6378
7	343.90	4537	2669	2897	3143	3412	3700
8	281.99	2176	2850	3093	3356	3643	3951
9	680.32	1295	3809	4134	4485	4869	5281
Total	2737.41	27834	32774	35569	38591	41893	45438

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4.3 Identification of Future Economic Opportunities

Many local entrepreneurs expressed their desire of implementing future development plan. A major portion mentioned that their desire is the expansion of their enterprises (80%) and others intend to increase their production (20%). Expansion of existing industries and establishment of new industries will create more jobs and thus will have multiplier effect in the overall economy of the town leading to more consumption and investment in diversified economic fields and thus push the economy upward.

Good quality furniture is built here that are marketed all over the country. There is good investment prospect in this field that will bring prosperity of the Paurashava. Other economic prospects are summarized 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.
- The Paurashava has been developed as a growth centre. Some cluster development is found around this growth centre. Planned development through the master plan will initiate to arrange the growth in a systematic manner. At the same time, economic development parallel to the physical and social development will be encouraged.
- The town has good prospects to local economic uplift provided appropriate government policies and initiatives are taken. People have money but they will have to be converted into capital. The following suggestions may be considered.

First, training on entrepreneurship development may be arranged for prospective young and educated entrepreneurs to encourage them to invest in manufacturing, in particular.

Second, there is tendency of the affluent to invest on land. Organized real estate can be developed with local initiatives. Banks may come up with credit in this sector. This will create new local employment in real estate and construction sector.

Third, local entrepreneurs may go for consumers' goods production targeting local market. Ambitious investors may go further and invest in exportable or export substitutes taking advantage of the proximity of the Chittagong Port and excellent road transport facilities available. The town has gas connection, which is a cheap fuel in the country. Industries using gas as fuel can be set up here. Government and local banks may provide capital support.

Fourth, prospective investors may also explore possibilities of investment in agriculture sector for local as well as export market, particularly, in fisheries, poultry and horticulture.

4.4 Projection of Land use

4.4.1 Estimation of Residential Land Requirement

The present population of the planning area has been estimated as 32774 (2011) as per growth rate of 1.65%. This gives a gross density 12 persons/acre. The future housing area need to be

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based on a recommended planning standard of 100 persons per acre. With this standard, the estimation shows, the land required to accommodate total projected population (45438) in the year 2031 will be 853.58 acres. But survey of existing land use has identified 737.82 acres of land currently under housing use with a low density of population (12 persons/ acre). The consultant, therefore, retracts the existing housing land (737.82 acres) for the population of the Paurashava for 2031.

Table 4.4: Estimation of Housing Land Requirement

Use/Facility	Recommended standard	Projected Population 2031	Estimated Land Requirement	Existing Land	Additional Land Requirement (2031)
General Housing	100 persons/acre	45438	454.40 acre	737.82 acre	-
Real Estate (Public/Private)	200 person/acre		227.2 acre		-
Total		45438	681.6 acre	737.82 acre	-

4.4.2 Estimation of Land for General Industry

According to approved planning standard the total land for industries comes to 113.60 acres with 68.16 acres for small scale industries and 45.44 acres for cottage and agro based industries. Currently total land for industrial uses stands for 14.46 acres. Rice mills, Saw mills, Ice factories, Seed processing industries, bakery factories are the main element of industrial base in Jhikargachha Paurashava. Presently no heavy or general industrial base has been grown in Jhikargachha Paurashava. So the consultants have currently proposed 55.75 acres of lands for industrial uses though as per planning standard, 113.60 acres of lands is needed.

Table 4.5: Estimation of Land Requirement for General Industries

Use/Facility	Recommended standard	Estimated Land Requirement (acre)	Existing Land (acre)	Additional Land Requirement by 2031 (acre)
Small scale	1.50 acres /1000 population	68.16	14.45	99.15
Cottage/ agro-based	1.00 acres /1000 population	45.44		
Total		113.60	14.45	99.15

4.4.3 Estimation of Land for Commercial Use

There is no reason to expect any sharp rise in business activities in next 20 years in the Jhikargachha Paurashava. The current land under business/trading use is only 31 acres including business areas beyond Paurashava that cover shopping and bazar areas. Up to the year 2031 (20 years) the demand will be 60.48 acres by the year 2031.

Part A: Structure Plan**Table 4.6: Estimation of Land Requirement for Commerce and Shopping**

Use/Facility	Recommended standard	Estimated Land Requirement (acre)	Existing Land (acre)	Additional Land Requirement by 2031 (acre)
Wholesale market	1.0 acres/ 10000 population	4.54	0	4.54
Retail sale market	1.0 acres/ 1000 population	45.44	30.50	14.94
neighborhood market	1.00 acre/per neighborhood market	9.00	0	9.00
Super Market	1.50 – 2.50 acres/per super market	1.50	0	1.50
Total:		60.48	30.50	29.98

For the sake of current planning the land may earmark as per standard for commercial land use and put them at appropriate locations where mixed use facilities may be developed privately or publicly. The total required commercial land will stand at 60.48 acres. The extra land requirement will stand at 29.98 acres.

4.4.4 Education & Research

Estimation of land according to standard indicates there will be a land requirement of 75.89 acres to accommodate educational facilities by the year 2031. If we deduct the already available 20.091 acres of existing land uses under various education facilities there will be a need of additional 57.54 acres of land for education facilities.

Table 4.7: Estimation of Land Requirement for Education Facilities

Use/Facility	Recommended Standard	Estimated Land Requirement (acre)	Existing Land (acre)	Additional Land Requirement by 2031 (acre)
Nursery	0.5 acre/10,000 population	2.27	-	2.27
Primary School/ kindergarten	2.00 acres/5000 population	18.18	5.93	12.25
Secondary/High School	5.00 acres /20,000 population	11.36	5.98	6.17
College	10.00 acres/20,000 population	22.72	8.97	13.75
Vocational Training Centre	5 - 10 acres / Upazilla	10.00	-	10.00
Other	5.00 acres / 20,000 population	11.36	-	11.36
Total		75.89	20.88	55.01

4.4.5 Health Services

There already exists an Upazila health complex on an area of 5.52 acres. Estimate shows 10 acres of land for the health complex according to recommended standard. The consultant feels that no additional land is required for the Upazila health complex for a Paurashava like Jhikargachha. So no additional land is proposed for the facility. In future, as the population and density increases, demand for local health facilities will increase. So according to standard, 9.09 acres have been allotted for Health centre/Maternity clinic. It is expected that a large part of the health services will be provided by the private sector.

Part A: Structure Plan**Table 4.8: Estimation of Land Requirement for Health Services**

Use/Facility	Recommended standard	Estimated Land Requirement (acre)	Existing Land (acre)	Additional Land Requirement by 2031 (acre)
Upazila health complex/ hospital	10 -20 acres/ Upazila HQ	10	5.52	4.48
Health centre/ Maternity clinic	1.00 acre/ 5,000 population	9.09	0.19	8.90
Total		19.09	5.71	13.38

4.4.6 Open Space

Field survey shows no public park or play field in the town for use by general public except play grounds in the premises of educational institutions. Total recommended land required for various open space recreation facilities stands at 104.97 acres. The facilities include, play field/ground, parks of various categories and stadium/sport complex.

Table 4.9: Estimation of Land Requirement for Open Space

Use/Facility	Recommended standard	Estimated Land Requirement (acre)	Existing Land (acre)	Additional Land Requirement by 2031 (acre)
Play field/ playground	3.00 acres/20,000 population	6.82	0.77	6.05
Park	1.0 acre /1000 population	45.44	0	45.44
Neighborhood park	1.00 acre /1000 population	45.44	0	45.44
Stadium/ Sports complex	5 – 10 acres/ Upazila HQ	5	0	5
Cinema/ Theatre	1.0 acre /20,000 population	2.27	0.14	2.13
Total		104.97	0.91	104.06

4.4.7 Transportation Facilities

In the field of transport establishment the consultant proposes such facilities as, bus terminal, truck terminal, rickshaw stands at selected places, baby taxi/tempo stand and passenger shed for local bus users. These categories of land uses required 21.26 acres of lands where there is one existing railway station with 0.58 acres of land. However, many of the proposals may seem pre matured, but will be necessary in future. If land acquisition for these facilities is delayed, land may not be available in future for providing such facilities.

Part A: Structure Plan**Table 4.10: Estimation of Land Requirement for Transportation Facilities**

Use/Facility	Recommended standard	Estimated Land Requirement (acre)	Existing Land (acre)	Additional Land Requirement by 2031 (acre)
Bus terminal	1 acre /20,000 population	2.27	0	2.27
Truck terminal	0.50 acre /20,000 population	1.14	0	1.14
Baby taxi/ tempo stand	0.25 acre /one baby taxi/tempo stand	1	0.2	1
Rickshaw/van stand	0.25 acre /one baby taxi/tempo stand	1	0.17	1
Railway station	4.00 acre / per Station	4.00	0.58	3.42
Total		9.41	0.95	8.83

4.4.8 Government Offices

Land for administration is meant for public sector and other office activities. The required land for Upazila complex is 15.00 acres of land and there is 2.74 acres of land available. The land required for Jail/sub-jail is 10.00 acres and there is no such existing land.

The existing land of Jhikargachha Paurashava Office premise is situated in an area of 0.21 acres, while the prescribed standard requires a range of 3.00 – 5.00 acres of land for this purpose. Consultant considers that this is not enough for Jhikargachha paurashava. There is land nearby that can be proposed for extension.

Other Government Offices (Police Station, Police Box/Outpost, Fire Station, Post Office) Requires 8.14 acres of land as per standard where there is already exists 2.77 acres of Police station and 0.53 acres of Post Office.

Table 4.11: Estimation of Land Requirement for Administration

Use/Facility	Recommended standard	Estimated Land Requirement (acre)	Existing Land (acre)	Additional Land Requirement by 2031 (acre)
Upazila Complex	15.00 acres	15	2.74	12.26
Paurashava Office	3 – 5 acres	4	0.21	3.79
Jail/Sub-Jail	10 acres/Upazila HQ	10	0	10
Police Station	3 – 5 acres/Upazila HQ	3	0	3
Police Box/outpost	0.5 acre/ per box	0.5	0	0.5
Fire Station	1.00 acre/ 20,000 population	1.14	0.97	3.7
Total		33.64	3.92	33.25

4.4.9 Community Facilities

For various community facilities, the land requirement has been fixed at 7.95 acres. 1.14 acres have been earmarked for Mosque and Temple, 2.27 acres for Eidgah and 2.27 acre for Graveyard. The existing coverage area of Mosque/Church/Temple is exceeds the standard requirement.

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There is 2.67 acres of graveyard in Jhikargachha Paurashava but all these lands are under mosque or family based and not centrally or publicly provided.

Table 4.12: Estimation of Land Requirement for Community Facilities

Use/Facility	Recommended standard	Estimated Land Requirement (acre)	Existing Land (acre)	Additional Land Requirement by 2031 (acre)
Mosque/Church/Temple	0.5 acre / 20,000 population	1.14	4.19	-3.05
Eidgah	2.0 acre/ 20,000 population	2.27	1.02	1.25
Graveyard	1.00 acre /20,000 population	2.27	2.67	-0.4
Community centre	1.00 acre / 20,000 population	2.27	0	2.27
Total		7.95	5.71	

N.B. * the coverage area of Mosque/Church/Temple has been exceeded Paurashava requirement already.

4.4.10 Utility Services

A number of utility establishments are required in a town to run services properly. The consultant, according to approved standard, has earmarked 2.27 acres for water supply installations, like, pump stations and other establishments related to water supply; there will be 9 waste transfer stations for collection of solid waste located at suitable locations. Each ward will have one station. So there will be need for 2.93 acres for 9 transfer stations. A dumping site will be developed over an area of 4.9 acres for final disposal of the solid waste. For electric power sub-station the estimated land is 0.76 acres. For telephone exchange office, estimated land is 1.14 acres where the existing land is 0.88 acres. It has been assumed that mobile phone plays a vital role in communicating than land phones. That is why no proposal was made in this connection. The total land requirement under this category is 18.59 acres.

Table 4.13: Estimation of Land Requirement for Utilities

Use/Facility	Recommended standard	Estimated Land Requirement (acre)	Existing Land (acre)	Additional Land Requirement by 2031 (acre)
Drainage	1.00 acre /20,000 population	2.27	0	2.27
Water supply	1.00 acre /20,000 population	2.27	0	2.27
Gas	1.00 acre /20,000 population	2.27	0	2.27
Solid waste disposal site	4 – 10 acres / Upazilla HQ	7	0	7
Waste transfer station	0.25 acres/per waste transfer station	2.5	0	2.5
Electric sub-station	1.00 acre/20,000 population	2.27	0.76	1.51
Telephone exchange	0.5 acre/20,000 population	1.14	0	1.14
Fuel Station	0.5 acre/20,000 population	1.14	0	1.14
Total		20.86	0.76	20.1

Chapter 5

Review of Policy, Law and Regulation

5.1 Introduction

The urban planning and land use regulations *per se* are neither good nor bad. They impact on land and housing markets favorably or unfavorably and result in social benefits and costs depending on their nature and the specific contexts in which they are applied. When regulatory costs outweigh benefits, regulations should be amended or repealed. Careful reforms of these regulations can result in a lower cost for urban development and for housing. An additional benefit could be in terms of a more functional spatial organization of the city or town. If the objective of orderly town development is to be achieved, regulations need to be amended from time to time to make them function effectively. Regulations and processes that facilitate land availability and uses for planned development at affordable costs need to be continued. Those that lead to contrary results need to be eliminated or modified.

The preparation of Structure Plan, Urban Area Plan and Ward Action Plan for the Jhikargachha Paurashava will be supported by the policies and relevant contemporary rules and regulations of the state. In the following paragraphs a review of the prevailing relevant policies, laws and regulation have been carried out.

5.2 Review of Relevant National Policies

5.2.1 National Land Use Policy 2001

To safeguard use of its land resources, particularly, valuable agricultural land of the country, government in 2001 declared the National Land Use Policy. The policy proposed for preparation of national land use plan which very much relevant to the current plan.

Key Issues of the National Land Use Plan

Preparation and implementation of national land use plan in order to ensure best use of land is a major objective of land use policy. The plan is to be based on the criteria of land productivity and land capability and land suitability, use and requirement of land by agriculture, forestry, industrialization, urbanization and housing. Following are the key issues of the national land use plan.

1. Execution of coordinated land conservation projects aimed at prevention of desertification in the northern region.
2. Take up effective programmes aimed at preventing weathering of land, conservation of land fertility, development and conservation of land in coastal areas.
3. Prevention of destroying the hilly landscape by earth cutting, excavation and removal of land. Appropriate measures to be taken against indiscriminate collection of earth and stone from hilly areas and disturbance ecological balance. Emphasis on watershed management.
4. Formulation and effective execution of land use plan act and in order to ensure planned use of land.
5. Payment of compensation to those who will be affected by land weathering and land acquisition by the government.

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6. Regular monitoring, survey and research on desertification in the northern region, land reclamation, prevention of weathering of land, multi-use of land, conservation and development of coastal area land and condition of watershed areas.

The policy stressed on most intensive and best use of scarce land resources of the country. In one of its objectives (objective 'Khas') the policy aims to introduce 'land use zoning', based on particular characteristics of land, to make best use of land, prevent unplanned expansion of residential areas and control indiscriminate growth of industrial and commercial activities. The policy called for planned and best use of land.

Observation

There have not been effective steps taken to execute any of the policies mentioned in the land use policy. In absence of execution the situation in land use and land management is severely being deteriorated in the country.

About 59% land of the Jhikargachha Paurashava is under the agricultural practices. According to the Landuse Policy, those lands should be preserved as agriculture land. For this purpose the first step will be to exclude agricultural from the Paurashava area. For such preservation, policy prescription such as', in case of rehabilitation of the landless people, Khas land will be emphasized for distribution by the government.' should be adhered.

5.2.2 National Housing Policy, 1993

The Government of Bangladesh formulated the first ever housing policy of the country in 1993. In describing the housing problems of the country, the policy, in its Article-2.3, expressed concern over concentration of population in some big cities, where housing is becoming a severe crisis without any effective role played by the government to create affordable housing. Concern was also expressed about the unplanned and haphazard housing area development. In objectives of the policy, it stressed (Article-3.3) on useful and effective strategy to tackle growth of unplanned and unhealthy habitations. The policy, in Article-5.1.4, committed to encourage private developers in land development, infrastructure development and house construction. The policy also made commitment to provide government assistance on participatory housing infrastructure development involving the community, NGOs, CBOs, private developers and social welfare organizations (Article-5.2.7). It also committed to assist in introducing new infrastructure development method based on leasing. In Article-5.2.8, the policy declared to provide necessary assistance to local governments in recovering investments in infrastructure and services and provide necessary training to their staff and employees to increase their efficiency. About the roles and responsibilities of the government (Article-5.7), the policy said that in housing activities the government will continue to remain as a facilitator. The government will provide housing only to the poor and the rootless classes of the society (Article-5.7.1). The policy also made commitments to encourage private organizations, NGOs and CBOs in housing infrastructure development, income generation and environmental improvement under its policy and local level planning (Article-5.7.3).

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.

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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 shelter less 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 Housing

Clause 5.9 of the Housing Policy describes about the rural housing. The Jhikargachha Paurashava is semi-urban 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,

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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.

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- 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 centers will be encouraged to conduct research on housing issues.

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- The National Housing Policy will be co-ordinate with other development policies e.g. land, environment, population, employment, social welfare, fiscal and monetary policies at national and local levels.

Observation

But despite formulation of housing policies, so far no effective programme and project have been undertaken. National Housing Authority has been formed but it is yet to draw up any workable programme to realize national housing policies. National Housing Authority has not been able to address the housing problem of the country particularly, in urban areas. The private sector housing has flourished in country, particularly, in big cities where land value is sky rocketing. But such housing is not benefiting the low and medium income group, who constitute majority of the housing need. Nothing has, so far, been done for participatory housing promotion. The conventional site and services approach to housing is still continuing that does not help solving housing problem of the mass people.

5.2.3 Population Policy 2004

Prepared in 2004, the Population Policy of Bangladesh responds to the critical need to deal with the complex national population problem in a holistic way. It also aims to build national consensus and synergy among institutions: public, private, civil society and NGOs about the problem.

Objectives

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

The Population Policy proposals can broadly be divided into four sectors, human resources development, decentralization of population activities, participation of NGOs and private sector in population planning, building of planned family.

Human Resources Development

The population policy aims to create a large skilled workforce, emphasizing on education and training strategies. It calls for introduction of population, public health and health science in all levels of education. Undertake initiative to incorporate population, family planning, maternal and child health and reproductive health issues in different curriculums of medical education. Design and implement appropriate training and learning programs for managers and service providers from different disciplines, covering the necessary mix of skills required for family planning, maternal and child health and reproductive health services. To this end, the policy aims to strengthen training activities including existing human resources development (HRD) institutions.

Decentralization of Population Activities

Decentralization of population activities is another area of recommendation of the population policy. It calls for decentralization of population activities and ensure people's participation in population control, nutrition and health activities; decentralization of services through devolution of power to the Upazila level and further below. The policy aims to prepare action plan through participation of local elites, opinion makers, women's representatives of poorer section of the

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society along with the local level Government official; empowerment of local level (Upazila and Union level) committees to generate fund for their use in improving quality; access to RH services is another aim of the policy; it also aims to ensure strong local Government presence for transparent administration. Mothers are to be oriented about family planning, maternal and child health and reproductive health through commissioning mother's centers at Union level and below.

Participation of NGOs and Private Sector

With a view to give a holistic approach, the population policy calls for making the NGOs and private sector as important partners. Hence, to ensure their active involvement in population activities at various levels the policy recommends the following strategies:

- a) Provide support to the registered NGOs in Health, Nutrition and Population sectors to work in the underserved areas;
- b) Encourage them to undertake motivational works and services particularly for the poor and other vulnerable groups;
- c) Engage them in awareness creation activities regarding the benefits of delayed marriage and delayed birth, health and nutrition issues as well as of STIs, RTIs, HIV/AIDS;
- d) Utilize NGOs and private sector effectively in community mobilization in population, family planning, maternal and child health and reproductive health activities; and
- e) Ensure coordination and intimate linkages of the NGOs and private sector with the Ministry of Health and Family Welfare and other relevant ministries and institutions and avoid duality.

Building of Planned Family

To keep the size of population contained in view of country's limited resources, the policy stresses, on all out efforts to popularize and ingrain the slogan "not more than two, one child is better". (a) The policy stresses on the effective role of the doctors in implementing the population policy. It calls for ensuring participation of government and non-government doctors in implementation of population program.(b) It also proposes to engage government and non-government doctors in reducing the incidences of RTI/STI and preventing the spread of HIV/AIDS towards ensuring better reproductive health services; (c) Encourage the doctors in providing family planning services along with information, education and motivation activities according to the need of their patients; (d) Provide family planning services regularly along with maternal and child health services in all government and non-government health facilities.

Legal and social Measures

A set of legal and social measures have been proposed by the policy to achieving the goal and objectives of the national population policy as well as for implementing the relevant program strategies.

Observation

1. The population policy has not been able to address the population issues adequately. There has not been any effort for 'all out efforts to popularize and ingrain the slogan "not more than two, one child is better"'.
2. The policy aimed at decentralization of population activities and ensure people's participation in population control, nutrition and health activities; decentralization of services through devolution of

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power to the Upazila level and further below. But there have not been any effective steps in this regard.

As a result the population of the country is increasing steadily giving warning about a grim future ahead.

5.2.4 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.

The Transport Policy had prepared in 2004, following are the policy objectives of Transport Policy.

1. To provide a safe and dependable transport service.
2. Removal of unnecessary control and formulation of laws and regulations conducive to providing service.
3. Fare control.
4. Determining the roles of the Government sector and the private sector.
5. To maintain an economic and environmental balance.
6. To ensure maximum good utilization of Government funds.
7. Expansion of the role of transport in the ever increasing economic activities.
8. Reduction of transport cost of goods for export.
9. Growth of traffic commensurate with economic development.
10. Formulation of transport system for Dhaka city (Greater Dhaka).
11. Introduction of an integrated transport system.
12. Provision of alternate transport systems.
13. Creating of awareness regarding better standard of life and safety.
14. Poverty alleviation.

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.

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- 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 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	Bullock Cart	4.0
Motor Cycle	0.3		
Tempo	1.0		
Auto Rickshaw	0.5		

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

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

Table-5.2: Design applications

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

* Special type to be used under special circumstances.

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

Part A: Structure Plan**Table-5.3: Existing and Recommended design lives**

Road Class	Existing Design		New Class	Recommended Design		
	Cumulative Million ESA's	Typical Expected Design Life (Years)		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 type-B / Upazila Road	1.0	10	Upazila	6	1.0	10
				5	1.6	10
Feeder Road type-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 use under special circumstances.

The policy makes discussion and recommendation such issues as road, road transport and traffic, non-motorized traffic, railway and integrated issues.

Strategic policy issues of the transport policy cover the following:

Greater private sector participation

Encourage greater private sector participation with national ownership of road and rail infrastructure; lease of infrastructure may be allowed on long term basis; encourage private sector in infrastructure development.

Effective co-ordination in transport

Better coordination to be established between the Ministries and Departments under its control; policy/rules & regulations will be formulated to achieve the goal of creating better working links between the Government and the public and private sectors. Creation of discussion and consultation forums will be created for policy implementation; Government to promote clearer objectives and responsibilities for each sector in order to create more integrated working relationships.

Promoting the role of the transport users

The Government will examine how best the interests of users can be represented within the existing national government and local authority system. The Government will establish a user role within its transport planning process.

Transport users should pay for the costs of services

The Government to introduce makes arrangements to realize cost of transport operation and road maintenance from road users through new fiscal policies; to protect public interest, the Government will regulate tariffs for passenger and goods both in road and rail transport.

Subsidies for transport services

The government should allow subsidy to the transport sector only on consideration of public interest.

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Create public awareness for the policy

Make people aware of the national transport policy.

Observation

1. Fare control policy could not be achieved.
2. Road safety is at stake.
3. Quality of roads has substantially deteriorated due to lack of regular maintenance.
4. Private sector is playing effective role in the transport sector.
5. Failure to take timely steps deteriorates transport situation in the capital city.
6. Development in the railway sector has been miserably poor.
7. No steps are visible about public participation in the transport sector.

5.2.5 National Environment Policy 1992

Government declared an environmental policy in 1992 with a view to safeguard the national environment. The main objectives of the policy are:

1. To promote natural balance and overall development by means of Conservation and development of environment.
2. To save the country from natural disaster.
3. To identify and control all sources of pollution and degradation.
4. To ensure environment friendly development in all sectors.
5. To ensure sustainable, long term and environment friendly use of all national resources.
6. To get involved with all international initiatives on environmental issues.

The comprehensive environmental policy covers as many as 15 sectors of development namely, agriculture, industry, health and health promotion, energy, water resources, flood control and irrigation, land, forest, wild life and biodiversity, fish and animal resources, food, coastal and maritime environment, transport and communication, housing and urbanization, population, education and public awareness, science, technology and research, legal framework, institutional structure. The consultant only highlights only those sectors that have relevance to urban development and planning.

Industrial Sector

The environmental policy on industrial sector call for taking up following environmental measures:

1. Take up pollution control measures for selected polluting industries
2. Potential polluting industries must incorporate control measures in its set up.
3. All industries must conduct EIA and take pollution control measures.
4. All industries in residential areas to be gradually shifted and new locations to be identified for planned industrial development.
5. The industries harmful for environment and producing non-biodegradable products must be gradually banned.
6. Any industries using harmful and toxic waste as raw materials must be banned.
7. Use heavy metals, like, mercury, chromium, lead should be discouraged in industries.
8. The industries producing pollutants should have their own system of pollution monitoring.
9. Introduce 'waste permit/consent order' to improve waste treatment and disposal system.
10. Recycling of waste in order to reduce the volume of waste.
11. Safeguard health of industrial workers..

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The policy document also indicated the concerned agencies to take care of implementing the above issues.

Health and Health Sector

This sector emphasized on the following environmental issues:

1. Supply of safe drinking water in urban and rural areas and introduction of low cost healthy sanitation system.
2. Control of pollution in all kinds of water bodies by municipal, industrial and industrial waste and toxic materials.
3. Ban on carrying waste during day time and in open garbage trucks.
4. All steps to be taken to protect public health and environment from kinds of radiations including x-ray, nuclear waste, all equipment producing radiation, atomic reactor and research, and all activities harmful for human health.
5. Include environment in the academic syllabi.

Energy Sector

The energy sector recommended the following policies.

1. Take up large scale for introduction of improved cooker and wide dissemination of the technology to conserve energy and save environment.
2. Popularize use of coal, kerosene and petroleum in rural areas in order to save fire wood, agricultural waste and cow dung and use them in agriculture as compost.
3. Promotion of biogas, solar energy, mini hydro electric unit and wind mill in rural areas as sources of energy.
4. Take up measures to reduce the amount of harmful elements in fuel including, sulfur in diesel and lead in petrol.
5. Increase research activities to invent alternative sources of energy.
6. Care has to be taken so that use and transformation of primary and commercial energy does not create any adverse impact on the environmental balance.
7. Appropriate measures have to be taken during extraction and distribution of different natural resources like, oil, gas coal, peat so that they do not create any adverse impact on air, water, land, hydrological balance and the eco-system.
8. Study the possibility of use environment friendly petroleum (free of lead).
9. Care has to be taken during giving fitness certificate to vehicles that emit black smoke. Mobile courts will have to be arranged to enforce the relevant legal provisions.

Transport and Communication Sector

1. Care to be taken to make the road infrastructure development congenial to environment and the development of roads does not impede drainage of water.
2. Appropriate measure to be taken so that the passengers and the transport do not endanger public health by indiscriminate throwing of solid waste and defecation.
3. The rail, road and water transport must adopt measures to control emission of excessive black smoke.
4. Creation of public awareness and take care about pollution of river water.
5. Control on water pollution to be ensured in inland river ports and dockyards.
6. Airports to be developed avoiding environmental degradation.
7. Care to be taken to reduce air and sound pollution by aircrafts.
8. Encourage railway rolling stocks that generate less pollution.

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9. Forestation on both sides of railways and roads.

Population Sector

1. Conduct study on impact of population growth on environment and take appropriate measures to mitigate the problems of population growth.
2. Prepare manpower utilization plan to make planned and effective use of human resources congenial to environment.
3. Emphasize participation of women in environment conservation.
4. Mark population as No.1 problem of the country and take appropriate measures to curb population growth.
5. As the poor are mostly affected by environment degradation, appropriate measures are needed to safeguard their health and save them from the adverse effects of environment degradation.

Observation

1. The pollution control measures against polluting industries has not been effective or inadequate.
2. No measure has been taken to shift industries from residential areas.
3. No measure has been taken to introduce 'waste permit/consent order' method.
4. There has not been an effective step to control of pollution in all kinds of water bodies by municipal, industrial and industrial waste and toxic materials. The situation is grave in industrialized cities like, Dhaka.
5. Ban on carrying waste during day time and in open garbage trucks has not been effective.
6. No wide spread programme has been worked out for popularizing improved cooker and wide dissemination of the technology to conserve energy and save environment.
7. No steps have been taken about control of pollution of river water.
8. No programme undertaken for forestation on both sides of railways and roads has been taken.

5.2.6 Industrial Policy 2005

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. The key objective of the Industrial Policy 2005 is to,

- set up planned industries considering the real domestic demand, prospect of exporting goods abroad, and discouraging unplanned industries in the light of past experience,
- accept private initiatives as the main driving force of economic development and uphold the government's facilitating role in creating a favorable atmosphere in order to augment private investments,
- arrange for state-owned industrial enterprises to be sold/transferred/leased or administered in any other way by the Privatization Commission or concerned ministries in order to accelerate the privatization process,
- take necessary initiatives to establish industries on state initiative in those sectors that are considered very important and essential because of national interest, where private entrepreneurs are not forthcoming,
- catering the needs for local and foreign market and also for consumer satisfaction of the local products; measures to be undertaken (a) produce world class quality products, (b)

Part A: Structure Plan

diversification of goods, (c) introduce cost-effective management in the production system, (d) more value addition in the industrial sector, and (e) provide support for enhancing productivity by using continuous, appropriate and advanced technology,

- provide inspiration for the speedy expansion of cottage industries and SMEs and for further investment in these sectors so that new employment opportunities are generated, unemployment reduced and poverty alleviation program made in the country.
- prioritize the expansion and development of agro-based and agricultural processing industries, and assist in the expansion of poultry, dairy and goat-sheep industry as agricultural industries.
- provide women entrepreneurs with all necessary assistance in establishing industries in various sectors. Increase productivity at enterprise level; produce high-value added products step by step through development and application of appropriate technology and increase of export through export diversification.
- provide all necessary assistance for producing environment-friendly product with the objective for creating a pollution-free environment in the industrial sector.
- expand the local market and establish more backward linkage industries in order to accelerate the export of high value-added garments produced in the export-oriented garment industries and other relevant industrial subsectors.
- Further enrich the industrial sector with the proper utilization of the country's various natural and mineral resources.

Strategy

All regulatory barriers will be removed within the quickest possible time 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 labor laws will be put in place to ensure congenial industrial relations.

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- 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.

Observation

1. The policy does not say anything about setting up of industrial estate or special economic zones to reduce environment pollution and make service provision easier.
2. Should have given more incentive on local-foreign joint investment. This policy will help technology transfer and help grow local entrepreneurship.
3. Diversified policy needed to encourage export diversification in order to reduce dependency on a few export items.

The Jhikargachha Paurashava is agro-based semi-urban area. To reduce poverty and generate employment opportunities, more efforts are needed to establish agro and cottage 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 labor will be needed. If these types of industries setup in a planned way, unemployment rate will decline and poverty alleviation will be accelerated.

5.2.7 National Tourism Policy

Promotion of tourism in Bangladesh under the aegis of the government started in 1972, following independence of the country. The main attractions of the tourism industry of Bangladesh are varied cultural heritages, ancient archaeological sites, Buddhist heritages and many eco-tourism sites, world's longest natural sea beach, etc. Recognizing the contribution of tourism to the socio-economic development of the country, the government framed the National Tourism Policy in 1992. In the Tourism Policy, status of tourism industry in Bangladesh was described, aims and objectives were defined and implementation strategies were suggested. The National Tourism Policy of Bangladesh was declared in 1992. Its main objectives are:

- To create interest in tourism among the people
- To preserve, protect, develop and maintain tourism resources
- To take steps for poverty-alleviation through creating employment
- To build a positive image of the country abroad
- To open up a recognized sector for private capital investment
- To arrange entertainment and recreation
- To strengthen national solidarity and integrity

In line with the policy, the Bangladeshi Government provides incentives to attract private sector partners. The incentives include tax-holiday, loans, concession rates for taxes and duties and in specific cases, allotment of land etc.

Observation

As per the recommendation of the National Tourism Policy, a 'National Tourism Council' headed by the Prime Minister and an 'Inter-ministerial Coordination Committee' headed by the Minister of

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Civil Aviation and Tourism were formed. Unfortunately, both the committees virtually remained dysfunctional. Until now, only two meetings of the National Tourism Council were held. The National Tourism Policy undertook some initiatives for a vigorous promotion of tourism within and outside the country. However, most of those remained unimplemented. Against this backdrop and emergence of private sector tourism industry, it is urgently felt that the 1992 policy needs updating.

5.2.8 Agriculture Policy

Agriculture Policy of Bangladesh was framed in 1999. A new policy under the present government is under preparation. The following review is on the 1999 Agriculture Policy.

The major issues dealt with in the policy are, seed, fertilizer, irrigation, pest management, agricultural research, extension services, marketing of agro-products, land use, education and training, environment and agriculture, women and agriculture, coordination of various agencies engaged in agricultural development. Most of these issues are not relevant to the current Master Plan. The only relevant issue is the land use. So, review has been carried out on land use only.

Land Use

The Policy stresses on all possible steps to ensure optimum use of land. Although land is a privately owned property in general, its use has to be compatible with the overall social goals and utility. Moreover, it is important to consider that the interests of small arid marginal farmers and the sharecroppers are protected, as they constitute the majority of farmers.

The policy targeted to take the following steps to ensure planned utilization of land for crop production:

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

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Observation

1. About one percent of agricultural lands is being converted into non-agricultural use every year. In a country of constantly growing population withdrawal of land from agriculture will affect food production. So it is necessary to safeguard farm land from conversion. But this vital issue has been partially addressed in the policy. It states only about fertile land and not agricultural in general.
2. Government has not framed any effective mechanism to discourage acquisition of land in excess of requirement for non-agricultural purpose.
3. To protect agricultural land immediate steps are necessary to delineate agricultural lands. This issue has not been covered in the policy. It has been found that large areas of agricultural lands are unnecessarily being included within Paurashava. Sometimes it is about 70% of the total Paurashava area.

5.2.9 Urban Forest Policy

Representing an amendment of the forest policy of 1979, current national forest policy was enacted in 1994 and officially announced on 31st May 1995 (Bangladesh Gazette, July 6, 1995, pp 241-244). The policy was formulated to initiate a 20-year Forestry Master Plan (FMP). The Government of Bangladesh, assisted by the Asian Development Bank and the United Nations Development Program, prepared the FMP to preserve and develop the nation's forest resources. The plan provides a framework for optimizing the forestry sector's ability to stabilize environmental conditions and assist economic and social development. As such, three imperatives were identified: sustainability, efficiency and people's participation (FMP 1994).

Objectives of the 1994 National Forestry Policy:

- To afforest about 20% of the total area of the country by initiating various afforestation programmes in forest lands, fallow lands, lands not useful for agriculture, hinter lands and other possible areas to meet the basic needs of the present and future generations and to ensure greater contribution of the forestry sector to economic development ;
- To enrich biodiversity in the existing degraded forests by conserving the remaining natural habitats of birds and animals.
- To strengthen agriculture by extending assistance to those sectors related with forest development, especially by conserving land and water resources
- To fulfill national responsibilities and commitments by implementing various efforts and government ratified agreements relating to global warming, desertification and the control of trade and commerce of wild birds and animals ;
- To prevent illegal occupation of forest lands, illegal tree felling and hunting of wild animals through the promotion of participation of local people;
- To encourage effective use and utilization of forest products at various stages of processing;
- To provide for and implement afforestation programmes on both public and private lands.

Statements of the 1994 National Forestry Policy:

The policy statements which are most relevant to participatory forestry are as follows:

- Community forestry and socially oriented leasehold forestry will be promoted by giving priority to poorer communities and poorer members of the community in the allocation of leasehold contracts;

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- Women and poor people who do not have a land-based source of livelihood will be employed on a priority basis in nurseries, plantations, forest management, harvesting and industrial work ;
- tree growing by communities, local groups or individual families on roadsides, windbreaks, canal/river banks and other public or marginal lands will be promoted through NGOs and relevant state agencies;
- Plantations on farms and private lands will be managed according to the priorities set by their owners or duly authorized tree growers
- Buffer zones attached to protected areas may be allocated for tree farming and agro-forestry on a long term lease basis;
- The State will provide technical assistance and financial support to promote all forms of homestead forestry;
- Industries located in rural areas, particularly those cottage and small scale labor intensive industries which contribute to the local economy and process wood and other forest based raw materials, will be promoted by the State ;
- The funds to be made available through international development assistance will be increasingly directed to support involvement of tree farmers and other producers in reforestation and forest and tree-based rural development;
- The FD is responsible for protection and management of the national forests but in areas under high demand the needs of local people will be accommodated through participatory management;
- The traditional rights of people living within and adjacent to designated forest areas will be maintained and their forest-related cultural values and religious beliefs will be respected;
- The State shall modify land-use, agricultural, industrial, trade, fiscal and other policies and related legislation in order to discourage deforestation and promote farm forestry;
- The FD will be re-structured and strengthened to support social forestry.

5.2.10 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.

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- 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.

Strategy

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.

5.2.11 Health Policy

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

- To develop a system to ensure easy and availability of health services for the people living in urban and rural areas.
- To ensure optimum quality, acceptance and availability of primary health care including government medical services at the Upazila and Union level.
- To adopt satisfactory measures for ensuring improved maternal and child health at the Union level and install facilities for safe child delivery in each village.

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- 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 Centers.
- 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.

Strategy

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.

5.2.12 National Urbanization 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.

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- Involve all sectors of the community, in participatory decision-making and implementation processes.
- Ensure social justice and inclusion by measures designed to increase the security of poor people through their access to varied livelihood opportunities, secure tenure and basic affordable services.
- Take in to account, particular needs of women, men, children, youth, elderly and the disabled in developing policy responses and implementation.
- Assure health, safety and security of all citizens through multifaceted initiatives to reduce crime and violence.
- Protect, preserve and enhance the historical and cultural heritage of cities and enhance their aesthetic beauty.
- Develop and implement urban management strategies and governance arrangements for enhancing complementary roles of urban and rural areas in sustainable development.
- Ensure good governance by enhancing transparency and establishing accountability.

5.2.13 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 (কাজের বিনিময়ে খাদ্য কর্মসূচি)
- 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 (একটি বাড়ী একটি খামার প্রকল্প)
- Back to home Program (ঘরে ফেরা কর্মসূচি)
- Food for Education Program (কাজের বিনিময়ে শিক্ষা)
- Rural Occupational Project
- Poverty Reduction Project (দারিদ্র্য দূরীকরণ কর্মসূচি)
- Self-employment Program for Women (নারীর জন্য আত্মকর্মসংস্থান)
- Women Empowerment Program
- Coordinated Women Development Program
- Peace Home Program
- Shelter Support Program (আশ্রয়ণ সহায়তা কর্মসূচি)
- Educational Allowance Program (শিক্ষা ভাতা কর্মসূচি)
- Aged-allowance Program (বয়স্ক ভাতা কর্মসূচি)
- Micro-credit Program (ক্ষুদ্র ঋণ কর্মসূচি)
- Allowances for Widowed, Poor and Husband-renouncement Women Program

Aim and Objective

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.

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- To emphasize for the development of rural wealth according to the equal distribution of economy and national development as prescribed in the Constitution of Bangladesh.
- To give confirmation to the rural people about infrastructural development, equal distribution of wealth and marketing of the agricultural production.
- To produce technologically efficient people about education, technical education and trainings in rural areas.
- Identification of demand and their fulfillment for socio-economic development of rural poor, persons involved with the production, especially small farmers and landless people.
- To reduce distances between towns and villages about services prevail through collective efforts and develop gradually.

5.2.14 Strength and Weaknesses of the Existing Policies

The Consultant has identified following weaknesses in the existing policies. These are –

Accommodation of future thrust, 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 Sundalpur gas field (Shahjadpur village in Sirajpur Union) 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 same time, 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.

5.3 Plan and Program

5.3.1 National Plan for Disaster Management

National Plan for Disaster Management 2008-2015 is an outcome of the national and international commitments of the Government of Bangladesh (GoB) and the Ministry of Food and Disaster Management (MoFDM) for addressing the disaster risks comprehensively. The plan has been developed on the basis of the GoB Vision and MoFDM mission to reduce the vulnerability of the poor to the effects of natural, environmental and human induced hazards to a manageable and acceptable humanitarian level by a) bringing a paradigm shift in disaster management from conventional response and relief practice to a more comprehensive risk reduction culture and b) strengthening the capacity of the Bangladesh disaster management system in improving the response and recovery management at all levels.

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Objectives of the Plan

The objectives of this Plan are to:

1. Align the strategic direction of disaster management programs with national priorities and international commitments.
2. Articulate the vision and goals for disaster management
3. Outline the strategic direction and priorities to guide the design and implementation of disaster management policies and programs.
4. Create a cohesive and well-coordinated programming framework incorporating government, non-government and private sector.
5. Ensure that disaster management has a comprehensive and all-hazards focus comprising disaster risk reduction and emergency response.
6. Illustrate to other ministries, NGOs, civil society and the private sector how their work can contribute to the achievements of the strategic goals and government vision on disaster management.

Observation

Bangladesh has taken a holistic approach for disaster management where emphasis has been given to work together with all the stakeholders and build strategic, scientific and implementation partnerships with all the relevant government departments and agencies, other key non-government players including NGOs, academic and technical institutions, the private sector and the donors. The role of Government is mainly to ensure that risk reduction and comprehensive disaster management is a focus of national policy and programmes.

5.3.2 National Plan of Action for Person's With Disabilities (PWDs) as well as Autism

In line with the Government policy the Department of Social Services under the Ministry of Social Welfare has an enthusiastic vision & mission to address the social issues relating to Person's With Disabilities (PWDs) as well as Autism. Bangladesh has formulated a good number of policies especially National policy for the persons with disability, 1995 for social protection and ensured the rights of the vulnerable groups. Accordingly concerned Ministry has formulated National Plan of Action to implement the provisions of the said convention.

In the recent time dynamic and sustainable steps have been taken for the PWDs. The steps are:

- I. To establish separate ticket counters in railway station, bus terminals, river ports, steamer terminal, airport and airways office to facilitate easy availability of tickets for the PWDs.
- II. To maintain reserve seats in the bus, train and water transports for PWDs.
- III. To fill up the 10 percent reserved quota for employment in the government jobs by the orphans and PWDs.
- IV. To construct a ramp in all the government offices to facilitate easy movement of the PWDs.
- V. To withdraw the existing restrictions regarding appointment of PWDs in the Govt. class I & class II jobs.
- VI. To arrange micro-credit for PWDs by all the Nationalized Commercial Banks (NCBs).

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Observation

Bangladesh, Ministry of Social Welfare is the lead Ministry and acts as the coordinating agency for Government and Non-government interventions towards addressing disability issues. Autism has received serious policy attention in Bangladesh. Over the years the country has made important gains in autism development through different measures. Indeed, Bangladesh has a robust portfolio of social protection programme which addresses various forms of risks and vulnerability of autistic children.

5.4 Act and Ordinance

5.4.1 Local Government (Paurashava) Act 2009

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

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

Functions of Paurashava in the Light of Paurashava Act 2009

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

The Master Plan should include the following:

- Survey of history, detail statistical information, public service activities and other mentioned subjects of the Paurashava;
- Development, extension and up gradation of any area within the Paurashava;

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- Control and regulation of development of any land, any building construction and renovation within the Paurashava.

Paurashava Development Management

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

Table-5.4: Functions in brief prescribed in the Local Govt. (Paurashava) Ordinance, 2009

Major activity	Specific functions	Functions in brief
Town planning	Master plan	The Paurashava shall draw up a master plan for the city which shall provide for a survey of the Paurashava including its history, statistics, public services and other prescribed particulars. Development, expansion and improvement of any area within the city; and restrictions; regulation and prohibitions to be imposed with regard to the development of sites, and the erection and re-erection of buildings within the Paurashava.
	Site development schemes	Where a master plan has been drawn up and approved by the government, no owner of lands exceeding such area as may be specified in this behalf in the master plan shall develop the site or erect a building or any plot of land covered by the provisions of a site development scheme sectioned to area in the prescribed manner. Among other matters, a site development scheme may provide for- (a) the division of the site into plots; (b) the street, drains and open spaces to be provided; (c) the land to be reserved for public purposes and to be transferred to the 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.
	Building control	If any building or anything fixed thereon, be deemed by the Paurashava to be in a ruinous state or likely to fall or in any way dangerous to any inhabitant of such building or any neighboring building or to any occupier

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

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

5.4.2 Act for Preservation of Natural Water Reservoir, Open Space, 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

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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.

5.4.3 Acquisition and Requisition of Immovable Property Ordinance, 1982

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

5.4.4 Brick Burning (Control) Ordinance, 1989

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

5.4.5 Rural Electrification Board Ordinance, 1977

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

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

5.4.6 Public Health (Emergency Provisions) Ordinance, 1944

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

5.4.7 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

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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.

5.4.8 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 Ordinance, 2009 under which the Master Plan (Structure Plan, Urban Area Plan and Ward Action Plan) is being prepared.

5.5 Review of Relevant Laws and Regulations

5.5.1 The Act (36 of 2000) for Conservation of Play field, Open space, Park and Natural Water Reservoir in Mega City, Divisional Town, District Town and Paurashavas of Bangladesh

Following is a review and observation on the relevant parts of the above mentioned act.

Restriction on Change the Land Use of Play field, Open space, Park and Natural Water Reservoir (Section 5)

According to the section 5 of the act, any land having such use as play field, park and natural reservoir can not be changed or can not be used for any other purpose.

Appeal (Section 6)

However, any land owner having any land with above mentioned use may apply to the appropriate authority to have permission to change the use. The authority shall convey the results of appeal within 60 days of the appeal.

Punitive Action (Section 8)

Any person violating the act may be liable to punishment up to 5 years of imprisonment or Tk. 50,000 fine or both.

Observation

1. The failed to give appropriate definition of water body. As a result the act creates legal complicity.
2. Enforcement of the act has not been effective. Despite prevalence of the act, rampant violation goes unabated.
3. Most urban centers do not have land use or master plan, as result there is no land use zoning. So the act can not be applied.

5.5.2 Bangladesh National Building Code (BNBC) 1993

The purpose of Bangladesh National Building Code (BNBC) is to establish minimum standards for design, construction, quality of materials, use and occupancy, location and maintenance of all buildings in order to safeguard within achievable limits, life, limb, health, property and public welfare. It aims to insure public safety, health, and general welfare insofar as they are affected by

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the construction ,alteration, repair, removal, demolish, use or occupancy or buildings, structures or premises, through structural strength, stability, means of egress, safety, from fire and other hazards, sanitation, light and ventilation.

The BNBC deals with such key issues as general building requirements, fire protection, building materials used, structural design of buildings, construction practices and safety and Building services. Besides, the code also deals with historic buildings with respect to their conservation and restoration. The code was formulated in 1993 but given legal status in 2008.

5.5.3 The Building Construction Act 1952

This act was prepared in 1952 to prevent haphazard construction of building and excavation of tanks that are likely to interfere with the planning of certain areas in Bangladesh. The act is usually exercised in areas under the urban local governments. The act sets some conditions regarding construction of buildings in urban areas where the act will be in execution.

Preparation of Master Plan

The act calls for preparation of a master plan of the area concerned before approval of building plan. The master plan shall show the future land use of the area through land use zoning. The buildings will be approved according to the land use provisions of the zoning plan.

Building Construction Rules

The act in its Section 18 keeps provision for preparation of Building Construction (BC) rules to ensure healthy and environment friendly building development. The last BC Rules were prepared in 1996. However, due to special characteristics of building development in Dhaka city a separate set of BC Rules was prepared for Dhaka City in 2008 under same act.

Power to Removal of Construction (Section 3B)

The act gives special power to plan approval authority to remove any building that did not follow the specified rules of the act or take action against any building owner who constructs building violating the rules after approval of the building plan.

Restriction on Cutting of Hills (Section 3C)

The act forbids cutting of any hill without prior permission of appropriate authority.

Removal of Unauthorized Building (Section 7)

The act empowers the authority to remove any building that has been built violating the BC rules. On failure to do so, the authority itself shall dismantle it and the entire cost shall be recovered from the owner as public demand.

Appeal

The act, however, keeps provision for appeal, if the owner finds himself aggrieved due to any action by the authority.

Observation

1. Master Plan zoning form the basis of building plan approval. But in most urban centers, there is no master plan. This hampers application and enforcement of the building construction rules.
2. There is serious lack of monitoring of disobedience of rules by the builders.
3. At Paurashava level the approving authorities do not follow the rules properly.

Chapter 6

Critical Planning Issue

6.1 Introduction

Chapter 6 of the planning report introduces the critical planning issues of Jhikargachha Paurashava. The discussion has been carried out on sectoral basis.

6.2 Transport

As a small town the Paurashava is yet to encounter critical transport and traffic problems as faced by large cities with huge traffic population. Sources of Jhikargachha transport problems are associated with admixture of contrasting traffic modes, faulty road network and disobedience of traffic rules.

6.2.1 Traffic Conflict

Traffic conflict is common and frequent phenomena in towns where there is admixture of transport vehicles-slow and fast-in the streets. Areas of conflict occur at point where there intensity of traffic movement is high. The consultant studied the traffic movement in all over the town and has identified two main points where the traffic conflict is the highest. These are Upazila More Intersection and Thana More Intersection. At these points the slow moving vehicles, like, rickshaw and vans come in conflict with motor vehicles, creating traffic congestion. Besides, bus and CNGs remain standing on these points for long time for boarding and descending of passengers. Upcoming other vehicles do not get required road space to cross the standing vehicles smoothly. For this reason, a sudden but short time jam has occurred. As the number of slow moving vehicles is higher the conflict is usually frequent.

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

6.2.2 Unplanned and Narrow Roads

Road network in the town is not planned nor standardized. As there was no town plans earlier covering road network, roads were developed in an unplanned manner. No standards have been followed in determining road width, network design. Road widths are of rural type. More than 84% roads of entire project area is less than or equals to 10 feet. Besides, more than 49% roads in Paurashava is less than or equals to 8 feet width. These roads are not capable to serve an Upazila town like Jhikargachha. Therefore, narrow widths of roads and poor maintenance have been marked everywhere. These also have been expressed in opinion survey of the households.

Narrow widths of roads have marked by most respondents as major road problems in the town. About 11% of the respondents have pointed to 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 town grows and density of population increases in future. As field survey shows, 30.87% of the households of the town reported that the road widths in front of their houses are 8 ft. or less. This is alarming, as there will be increase in population leading to higher density. In future traffic will rise and will create serious traffic congestion on the narrow streets.

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There is little chance that the authority will be able to increase the road width in highly built up areas- especially in the crossing point of main bazaar area, as there will be high cost involvement and social-pressure on any attempt to demolition.

6.3 Environment

6.3.1 Drainage Problem

The condition of drainage service in the Paurashava is in critical shape. There is no hierarchy of drains and they are not properly connected. Therefore, water logging occurs at various points. Only in Paurashava Office area there are a few pucca drains. In rest of the town, either there is no drains or where exist, they are all katcha or semi-pucca. As a result during the concentrated heavy rainfall the water stagnation is frequent. Major natural drainage channels have been encroached (mainly in the Bazar area as well as the adjacent khals) causing their width to become narrow reducing the flow of water. Reoccupying the drainage encroachments and opening up of the system is highly lacking. Powerful encroachers often hinder such attempts. As a result problems of the primary drains remain unresolved.

6.3.2 Waste Management

The Paurashava has only 7-8 mobile and fixed dustbins at different locations. It was reported and proved that, the authority did not maintain formal dumping system so that there is no formal dumping ground. A portion of the wastes were dumped on the canal beside the road. The Paura authority could not ensure the prohibition of waste dumping along the entire length of the canal, which has blocked the canals at several points. The authority only collects waste from road side points and dustbins. Door to door collection system is yet to start in the Paurashava. Negligence of duties/responsibilities of staff is another main problem for inadequate operation and maintain of the drainage system.

Jhikargachha Paurashava suffers from the shortfall of funding to provide sufficient drainage system as well as its proper operation and maintenance. Only 4 staff including 3 contractual are engaged in its conservancy division for street sweeping, solid waste collection, cleaning and maintenance of drainage system. But due to the lack of equipments they are unable to do cleaning and maintenance. Negligence of duties/responsibilities of staff is another major problem for the drainage system.

6.3.3 Water Supply

Due to salinity of the ground water, drinking water is a critical problem in the town. Most people use surface water from ponds. But with the advent of urbanization these ponds are likely to get filled up as land prices go up. Besides, in the face of increasing population the existing ponds are unlikely to serve as the only sources of water supply for the constantly growing population. This will create problem regarding water supply in the town in future.

6.4 Land Use Control

Misuse of land as well as failure of land use control in Bangladesh is a common scenario. It is problem for the Development Authorities (RAJUK, KDA, CDA etc.) where master plans have existed. The major reasons for this failure are ignorance of existing laws, lacks of proper control mechanism, and absence of land use plan as well as Master Plan. However, Master Plan approach did not satisfactory work in Bangladesh mainly because cities and towns have grown

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much faster than the Master Plan could even foresee. Lack of regular revision of Master Plan is another reason.

6.5 Disaster

Bangladesh is a land of abundant and regular rainfall and the annual inundation of the rivers. The whole district is practically free from drought. Water, however, subsides rapidly and the damage caused is not mostly very serious. The southern part is exposed to cyclones which sweep across the Bay of Bengal, driving the waters before them in great waves which sometimes overflow vast tracts of country, drowning men and cattle, destroying crops and often leaving behind them a residue of salt which interferes with cultivation for some time. In the year 1797 there was such a cyclone, described as the most destructive in the memory of men. Severe cyclones occurred in 1822, 1825, 1848, 1867, 1876, 1893, 1895, 1941, 1958, 1960, 1961, 1963, 1965, 1966, 1968, 1970, 1988, 1991, 1997 and 2008. These years are not only memorable years curse for the people of Noakhali including Jhikargachha. These years are synonymous with the death and cataclysm. Besides, earthquake of 1762 and 1897 came to the people as a scene of great shock wave but a little injury as the district lies outside the main earthquake zone of the country.

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Chapter 7

Land use Zoning Policies and Development Strategies

7.1 Background Study

Bangladesh is a small land mass with a large population, increasing at a rate of over 1% per annum. About 116 million population of the country is sheltered and feeded from its 1,44,000 sq.km land, where the density is 10015 per sq. km. the highest in world. Over 60% employment comes from agriculture and all urban development take place on land. Thus land is the most valuable resource of the country. But with rapid urbanization agricultural land is reducing every year at an alarming rate. As there is hardly any fallow land all settlements take place by devouring valuable farm land. Once gone out of farming this land never come back to agriculture again. Thus country is losing net food and cash crop. Losing food crop means throwing the entire nation into a vulnerable position of food insecurity. Under such a circumstance, it is the utmost responsibility of the government and the professionals to make the most judicious use of land for non-productive purposes. Make the best use of scarce land and economize land use. Any strategy for land use development should thrive on this basic theme.

7.2 Structure Plan Zone

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 (2012-2021) period. Within this area, there are differences in levels of provision, particularly between the formally developed and planned areas and the majority of unplanned areas. Levels of provision should be maintained in the planned areas.

Fringe Area

This zone is developing areas which will take further decades to reach the population densities of the urban core area. Low initial densities in these areas do not justify supply of a full range of services as they will initially be underused. However, it is essential that planning and reservation of rights of way, at least for primary networks, be undertaken soon to enable provision when justified by increased density levels and allowed by resources. It will be very difficult to find difference between Fringe Area and Peripheral Area in most of the Upazila level Paurashavas. But a very few Paurashavas this difference will be very clear. Fringe Area will be used for these categories of Paurashavas.

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.

New Urban Area

This zone will be the required additional area for future planned urban development as per population projection. Existing physical trend of growth and potential areas shall have to be

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considered in demarking for new urban land development. New facilities and services like road, drains, footpath, waste transfer station and other civic services will be provided. This area is proposed to grow within 2031.

Agricultural Area

Agricultural land (also **agricultural area**) denotes the land suitable for agricultural production, both crops and livestock. It is one of the main resources in agriculture. The land under annual crops, such as cereals, other technical crops, potatoes, vegetables, and melons; also includes land left temporarily fallow; land under permanent crops (e.g., fruit plantations); areas for natural grasses and grazing of livestock.

Water body

Water body containing an area equals to or more than 0.20 acres excluding those of khal, irrigation canal and river (sometimes parcel of land may separated from the main flow due to the GIS database management and the existing condition) will be treated as this category.

The total area of Jhikargachha Structure Plan area is 2737.41 acres (11.08 sq. km.). The policy zone wise detail area of Jhikargachha will be as following table.

Table- 7.1: Structure Plan zone wise area distribution

Policy Zoning	Area in Acre	Area in Sq. Km.	%
Agricultural Area	726.10	2.94	26.52
Circulation Network	389.80	1.58	14.22
Core Area	255.58	1.03	9.34
Fringe Area	709.27	2.87	25.91
New Urban Area	497.34	2.01	18.17
Peripheral Area	15.30	0.06	0.56
Water Body	144.42	0.58	5.28
Total	2737.41	11.08	100.00

7.3 Strategy to achieve the targets of Optimum and Organized Use and Creation of Congenial Urban Habitable Environment

Currently there is hardly any control over private development all over the country. Situation in Paurashava is more precarious. Land owners are not aware of the disadvantages of spontaneous development. To save valuable land and create livable environment the following strategies may be adopted:

a. Prepare land use and development plan for the Paurashava

This is necessary to streamline use of land and impose control on indiscriminate use and abuse of private land.

b. Implement plans with strong hand

Establish good governance in enforcement of plan provisions without any compromise or favour. This is necessary to create a culture of abiding by the rules and plans.

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c. Enforce building construction rules to their maximum

To achieve the target of organized development and create an urban livable environment the building construction rules have to be adhered. It is responsibility of the Paurashava to ensure strict execution of the rules.

d. Involve land owners in planning and development

In the wake of public sectors inability to achieve comprehensive development it has become necessary to evolve innovative ideas in participatory land development. Effective participatory development will help achieve the targets of planned development with basic urban services at almost no government cost. Customized land readjustment, land pooling and guided land development methods may be tried as pilot projects.

e. Make land owners aware of the ills of spontaneous development

The land owners must be made aware of the demerits of free for all development and the benefits of planned development, wider road, and open space. This may be achieved through seminar, workshop, local level meeting and group discussions.

f. Avoid lavish land acquisition based development

To save scarce land resource it is necessary avoid development proposals that involve huge land. This is necessary to save valuable land.

g. Set 24 ft, as the minimum road width for local roads

Narrow roads are sources of traffic congestion that create uncomfortable living environment and reduce property value. To avoid future congestion on narrow roads it is necessary to encourage and promote wider road at local level.

h. Involve planning department of the Paurashava in local development

Initial roads at local level are designed by the local community. Within Paurashava boundary planning department of the Paurashava should be involved in such initiatives. The advice and negotiation the local community leaders should will be convinced in favour of wider standard road.

i. Prepare standard design for local roads

Paurashava planning department should prepare standard design for local road and compel land owners to follow the standard while developing local roads on community initiatives.

j. Develop major road on comparatively vacant land instead of widening existing roads

Widening existing road is often more cumbersome and costly. Develop new major roads on vacant land is less costly. It will be free of negotiation and litigation.

k. Land contribution for road widening

In case widening is necessary it will be best to liaise with land owners for land contribution through negotiation. This will keep the cost of road development minimum.

l. Emphasis on compact town

In a country of scarce land supply emphasis should be more on compact development instead of horizontal expansion of the town. Horizontal expansion of settlement will increase the Paurashava cost of providing urban basic services. Infilling of vacant land should be stressed. To compel

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infilling restore to taxation on vacant land. This will increase supply of urban land and reduce unnecessary horizontal expansion of urban centers and thus will ensure compact development.

m. Involve local land owners while planning and implementing ward action plans.

Care should be taken to involve local land owners in planning and implementing ward action plans. This will create belongingness of the beneficiaries to development and help achieve development targets.

n. Choose areas for priority development

Select most potential areas under ward action plan for development and avoid indiscriminate development. Mobilize all resources to develop the selected area. Stress on public participation to avoid lengthy and complex process of land acquisition.

o. Create places of industrial agglomeration

Create selected places of industrial agglomeration providing all necessary services and facilities to encourage the entrepreneurs to set their industries in those places.

p. Encourage and promote alternative sources of water

To create sustainable supply of water restore to new water sources, like, surface water from river, khal and rain water harvesting. Gradually reduce absolute dependency on ground water.

q. Get the habit of hygienic disposal of solid waste

Paurashava citizens should be taught on the benefits of livable environment and health by hygienic disposal of solid waste. This should be promoted through participatory methods involving beneficiaries.

r. Encourage and promote hygienic sanitation

Discourage people disposal of human excreta into surface drains and use sanitary latrine.

s. Take all legal and preventive measures to stop encroachment of drainage path.

Take measures to recover illegally occupied drainage channels and prevent further encroachment of canals and state owned water bodies.

t. Discourage infrastructure development in uninhabited areas

No infrastructure should be provided in areas unlikely to develop in near future. The money saved can be used for improvement of services in existing habitat areas.

u. Undertake commercial land development to increase land supply

Paurashava can provide housing land in a planned environment to increase land supply. It can also encourage private developers to land development so that they can supply housing land under certain rules and standards. Ensure that lands are supplied in a planned environment provided with all necessary basic services. Take measures to secure public interest.

v. Strengthen Paurashava manpower capacity and skill

To execute the above strategies the existing Paurashava manpower capacity should be enhanced. More over to equip them with new ideas and efficient discharge of duties they should be trained for skill development.

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w. Raise Paurashava income

Paurashava must adequate resources to execute development project. For this reason its resources base has to be increased. Existing sources should be strengthened to procure greater income, while new sources have to be explored to enhance income. Attention should be paid to secure highest possible revenue from holding tax, the leading source of Paurashava income.

x. Make best use of khas land

Paurashava should take over all khas land and develop facilities to benefit the people. These lands can be used for play field and park development; for community centre development. It is advised not to make commercial use of khas land.

y. Areas for conservation and protection

The heritages of the Paurashava should be safe guarded and preserved to protect the identity of the Paurashava. It should conserve and safeguard structure and places, like,

- historical building, monument, sculpture or any other related articles.
- park, important play field or any other active recreational areas.
- River front areas and the places of natural beauty where go for recreation.

z. Identify and protect areas of ecological significance

It is important to protect ecologically sensitive areas before they are inadvertently destroyed. This will include areas of forest / bushes and areas of un-spoilt river line, water body. Once the initial priority of protection is successfully achieved, measures can be taken to enhance the quality of these areas.

7.4 Policies for Socio-economic Sector

7.4.1 Population

Controlling population growth should be given utmost importance nationally, as because of the uninterrupted population growth, the country's economic problems are being accentuated, pressing on its limited resources. It makes poverty reduction difficult which is the key to overall national development. So it is necessary to enhance population control drive. An efficient, well trained and well paid grass root level work force can help profoundly in achieving the targets of population control policy of the government. Side by side promotion of education can be very effective tool in creation of awareness about small family size.

Strategy:

- Raise the level of education among mass people.
- Create grass root level population control program emphasizing more on grass root level family planning workers services with effective delivery of birth control services.

Policy:

Item	Executing Agency
<u>Population Policy/1:</u> Declare population as one of the most critical sectors of national development	<ul style="list-style-type: none"> ✓ Ministry of Planning, ✓ Ministry of Health and Family Planning

Part A: Structure Plan

Item	Executing Agency
Justification: Per capital national growth is being eaten up by constantly growing population. By controlling population national benefits earned from economic growth can be shared in a better way, raising the level of living of the people.	
Population Policy/2: Put more efforts and resources in raising the level of education.	✓ Ministry of Planning, ✓ Ministry of Health and Family Planning, ✓ Ministry of Education.
Justification: Education would not only create awareness among the masses about the benefits of small family size, it will also help secure better job with higher pay that would reduce poverty.	
Population Policy/3: Create well paid and well train grass root level family planning workers for motivational work.	✓ Ministry of Planning, ✓ Ministry of Health and Family Planning,
Justification: Grass root level workers can give door to door motivational services and distribute birth control materials in a better way. To get good services they must be well paid and efficient.	

7.4.2 Economic Development and Employment Generation

About 60% of total population belong to age group 16 to 55 years; form the national work force in Jhikargachha. Remaining about 40% lies under nonworking group. Being 22.39% working group people are female and non income group (housewives). The actual percentage of working people is about only 38.26% of the total existing population. This means that, there is a very low level of working force in Jhikargachha.

Population projection at a growth rate of 1.65% shows that the size of population, who will come to the working force, will be 45438 including the students and housewives by 2031 (for detail calculation, please see the annexure- 9.6 of Interim report). Economic development of any place is associated with generation of employment. But there initiative to generate employment opportunities in Jhikargachha is not adequate to cope with growing labor force. There is need to invest in basic industries to boost non-basic sector that will generate employment on a large scale.

Generation of employment depends on the rate of investment in various sectors of an economy. An urban economy of any town starts building up with investment in the basic sector that leads to the building up of the non-basic sector. Investment in basic sector is not very bright in Jhikargachha as it is a very small town with a very low level of population. Besides, it has to compete with other adjoining urban centers like, Kabirhat, and larger towns, like, Feni and Noakhali. These urban centers serve as counter magnets of investment.

Strategy:

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

Part A: Structure Plan**Policy:**

Item	Executing Agency
<u>Economic Policy/1:</u> Provide bank loans on easy terms to attract prospective investors in the SME sector.	✓ Ministry of Industries. ✓ Ministry of Commerce.
Justification: Easy loans would encourage and attract prospective investors for investment in small scale industries.	
<u>Economic Policy/2:</u> Take measures to channelize remittance to value adding productive sectors.	✓ Ministry of Industries. ✓ Ministry of Commerce.
Justification: Larger amount of remittance is being diverted to land purchase, which is considered as the safest investment. This huge capital may be channelized to productive sectors to help create more employment through proper policies.	
<u>Economic Policy/3:</u> Arrange entrepreneurship training programmes for prospective investors.	✓ Ministry of Industries. ✓ Ministry of Commerce.
Justification: There are many potential investors who are ignorant of the ways and means of investment and operating an enterprise, The training can help them get educated in these lines.	

Bangladesh Bank has started a project to use remittance as capital investment rather than idle money through motivating people, making formalities easy to reduce hassle and initiate enterprises locally. A good number of inhabitants of Jhikargachha region live abroad. They could use this opportunity to utilize their huge amount of idle remittance to channelize in the productive sector. The Paura. authority may take initiative together with public line agencies to facilitate channelizing remittance towards productive sector.

7.4.3 Housing and Slum Improvement

As the town has low level of population and not industrialized, housing is yet to become a problem here. Spontaneous house building is common in Jhikargachha. There is still shortage of dwelling unit in Jhikargachha. Considering the annual growth rates of household and dwelling unit mentioned in BBS 2001, the demand for housing unit will be 5379 in 2031 (for detail calculation, please see sub-section 5.8.5.2 of chapter 5 of Jhikargachha Interim Report).

National Housing Authority executes housing policy and programmes on behalf of the national government. There is no local office of the National Housing Authority to execute housing programmes at Upazila level. As a local government, Paurashava can facilitate housing area development by means of providing road infrastructure, drainage, water supply, etc in designated housing zones. The consultant supports the prevailing national housing policy and advocates its execution at all levels, which is highly lacking.

In context of residential area of Jhikargachha, existing residential land cover the requirement of land for 20 years population demand, but in reality, most of the residential land is ancestral land that has minimum scope to accommodate a large number of migrated populations coming to Jhikargachha due to its future growth if the plan will be executed as assumed. In that case, vertical expansion is the ultimate prescription considering land scarcity and population growth.

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

Strategy:

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

Policy:

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

7.4.4 Social Amenities and Community Facilities

Social amenities and community facilities include education facilities, health facilities, open space recreation facilities, like, park and play ground, amusement park, community centre. For comfortable and healthy urban living these facilities are the fundamentals. Since these are social services, they must be provided by the public sector agencies as public goods. For education and health facilities national government has policies and there are separate ministries and their agencies to execute the policies through programmes and projects. These agencies also have Upazila level offices to take care of the national education and health policies and programmes execution. For providing amenities like, park and play ground, community centre the responsibility lies with the Paurashava.

For park and playground the Paurashava may secure local khas land. The open space recreation is difficult to provide as population expands and land price goes higher. Once time is lost vacant lands are also lost. Amid soaring land price and absence of vacant land, it becomes extremely difficult to provide open space recreation. So, it is better to secure vacant lands for open space before density of population increases and land becomes scarce. For community centre intensive use of land should be made by making multiple use of same space. For example, providing community centre, ward commissioner's office, clinic or any other uses in the same building.

Strategy:

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

Part A: Structure Plan**Policy:**

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

7.5 Physical Infrastructure Sector**7.5.1 Transport**

By far, transport is the most important means to revitalize an urban centre. Intra and inter transportation facilities create economies of scale for prospective investors and enables easy and comfortable mobility of people and goods. Easy and cheaper transportation of raw materials and finished goods create good investment climate for manufacturing enterprises that lead to development of the service sector firms. New employment generates and the non-basic sector expands leading to development of thriving urban centre. To create transportation facilities, quality inter-district road network will have to be created that makes movement faster and easier. With good infrastructure transport there will be induced growth of road transport. Besides, quality of local roads will have to be upgraded to encourage people live in the town. Once population starts increasing it will expand local consumer market and will attract new investments in consumer goods production.

Strategy:

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

Policy:

Item	Executing Authority
<u>Policy-Transport/1:</u> Development of efficient inter-city road network with standard roads.	- Roads and Highways Department (RHD)
Justification: Increased inter-city mobility will increase business transactions and generate investment and employment.	
<u>Policy-Transport/2:</u> Promotion of efficient road transport facilities between urban centers.	- Bangladesh Road Transport Authority (BRTA). - Deputy Commissioner, Noakhali.
Justification: Not only that communication is needed between urban centers, but to attract transport movement emphasis must be laid on quality of roads built.	
<u>Policy-Transport/3:</u>	- Jhikargachha Paurashava.

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Item	Executing Authority
Development of local road network through participatory approach.	- Local Government Engineering Department (LGED).
Justification: Development of roads will involve huge cost. Participatory development will enable cost sharing, which will reduce cost of road construction substantially.	

7.5.2 Utility Services

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

Strategy:

- Attainment of self reliance in revenue collection and adoption of participatory approach to service provision to ensure better services and facilities to the people.
- Address national policies regarding social services effectively.

Policy:

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

Part A: Structure Plan**7.6 Environmental Issues**

From environmental point of view Jhikargachha Paurashava is yet to reach a vulnerable position. There are some issues that must be taken care of before they turn precarious. The issue of sanitation has already been dealt with in utility services section. Except cyclone there is no natural hazard. There is no air, water or soil pollution in the Paurashava from any source.

7.6.1 Natural Resources

The Paurashava is not endowed with many natural resources that can be conserved. Among the meager natural resources available it has are, 1138 number of ponds, and 8.38 km of natural drainage canals. These need conservation to ensure sustainability in drainage and water supply of the Paurashava.

Strategy:

- All khas land and canals should be crested with Paurashava for use in community interest.

Policy:

Item	Executing Agency
<u>Policy-Nature /1:</u> All khas land within Paurashava must be assessed and handed over to the Paurashava for use in community interest.	- Ministry of Land - Jhikargachha Paurashava
Justification: This will prevent misuse of khas land by political and the powerful persons.	
<u>Policy-Nature/2:</u> All canals within Paurashava must be vested with the Paurashava for maintenance and proper use as drainage channel.	- Ministry of Land - NGO and CBO
Justification: This will help prevent unauthorized occupation and filling of natural drainage.	

Chapter 8

Implementation Issue

8.1 Introduction

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

8.2 Institutional Capacity Building of the Paurashava

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

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

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

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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 Maheshpur 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.

8.2.1 Staffing and Training

As a traditional system of the Paurashava, engineer and secretary are appointed directly by the Ministry of Local Government, Rural Development and Cooperative and other staffs are appointed locally through the approval of the Ministry after the advertisement on the newspapers. In Maheshpur Paurashava, the revenue income is too low. That is why it is not capable to pay the salary of all the officials and staffs. This is the main reason for under staffing of the Paurashava. There is no proper arrangement for staff training. As a result, the staffs are mostly unskilled. They cannot deliver proper service to the citizens. Besides, most of them are not qualified enough to render proper services.

8.2.2 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.

8.2.3 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.

8.2.3.1 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

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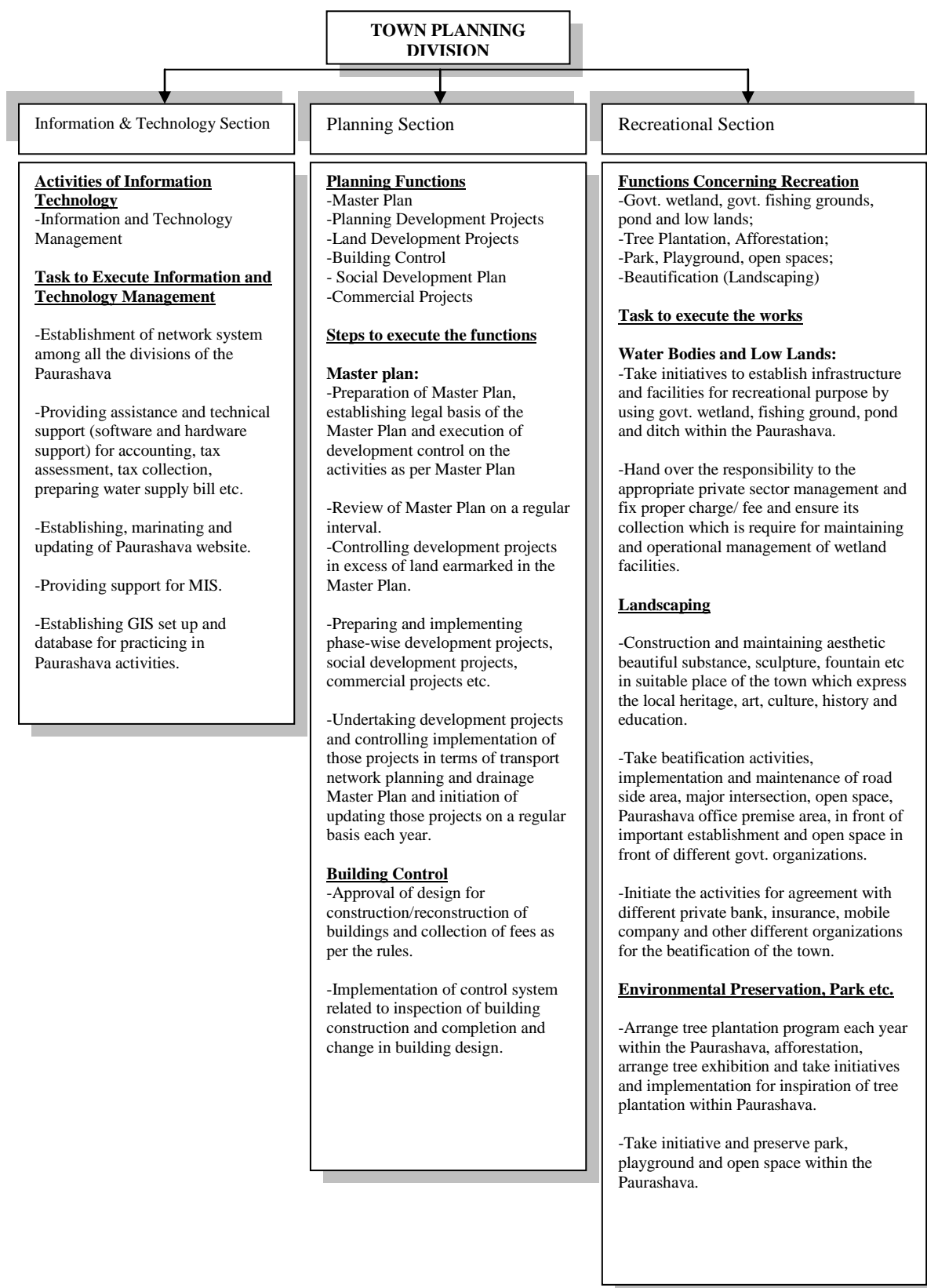
development and control' well and serve the inhabitants presently as well as in the future. The planning unit/division may have some sections that are as follows:

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

According to the division and it's 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 below.

Part A: Structure Plan

Figure 8.1: Scope of Work for Planning Division



Part A: Structure Plan

8.2.3.2 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.

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

Support 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'.

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

Urban Planning and Environmental Improvement

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

Urban Poverty Reduction

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

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

Income Generating Activities

The income generating activities include:

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

Transparency and Accountability

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

- Administrative Reformation of Paurashava.
- Set Vision, Mission and functions for each department/ section of the Paurashava.
- Functions to be decentralized, transfer and coordination with other authorities.
- Establishment of Capacity Development Committee in Paurashava-level.
- Establishment of Urban Information Services Centre at Paurashava premises.
- Meet the Mass people of Paura-Parishad.

8.2.4 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

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mostly prepared during the colonial rule to serve its own interests. Even after independence from the British, the issue of good governance was not infused into the new Acts formulated.

8.2.5 Good Governance in Legal Provisions

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

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

8.2.6 Financial Issues

Governance in Maheshpur Paurashava

Financial governance refers to transparency and accountability of financial matters. All financial matters must be transparent to all. People must know about the policies and programs of the Paurashava, how much revenue is collected each year and the amount of expenditure made on annual development. They must also be answerable to the people on how the public money is being spent and accounts being maintained.

The Ministry of Local Government, Rural Development and Cooperative has undertaken a number of projects in respect of establishing governance in upgrading Paurashava accounts system, like, UGIIP, STIFPP. Computer and accessories are supplied under these projects for automation of the accounts system. Besides, trainings are also offered to the Paurashava accounts staff for enabling introduction of automation in accounts system. But all these services have not yet reached Maheshpur Paurashava.

Revenue Management

The Paurashava still follows a traditional management system in tax collection and revenue management though a scheme of computerized automotive financial system has already been introduced in this Paurashava. Assessment section is responsible to assess the tax of the Paurashava and tax collection, and license and bazar section are responsible to collect the tax of the Paurashava. The public is mainly informed about tax collection during the presentation of

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annual budget. They may, however, get information from the councilor or Paurashava accounts office.

Paurashava's Financial Capacity and Plan Execution

The main focus of Paurashava financial governance is to establish automation in entire financial management. This includes computerization of accounts system, holding tax management, and billing of different service charges. Software for above functions have been supplied and installed in the Paurashavas covered by financial automotive projects. The projects also provided training to the relevant staffs for functioning of the systems. With the implementation of these projects people can now instantly know about the status of their tax payment, bill payment, and licensing. This has not only made the functions of the Paurashava easy, but also has freed the citizens for paying bribe, and experiencing hassle. The size of annual budgets of the Paurashavas indicates the poor financial status of the Paurashavas. With low income, Maheshpur 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.

8.2.7 Monitoring, Evaluation and Updating

Monitoring and evaluation is a very important part of plan implementation. Monitoring helps check if the plan is being implemented properly. It also measures the level of implementation of the plan. If the plan implementation is not on track, corrective measures can be taken to put execution on the track. After expiry of any plan, evaluation is made about the errors and omissions. Such evaluation helps take corrective measures in the next plan. Such monitoring and evaluation must be carried out from within the Paurashava. But Maheshpur Paurashava is not equipped with qualified manpower to make such evaluation. Monitoring and evaluation of a plan is essentially, the responsibility of qualified and experienced planners. However, plan evaluation can be accomplished by means of out sourcing as and when it is required.

8.2.8 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 Maheshpur Paurashava. There is no town planner in the Paurashava, review and updating of the Master Plan will require service of senior level planners that Paurashava might be able to provide. But more planners are needed for this Paurashava. This service will have to be procured by out sourcing and the Paurashava is not even capable to accomplish this financially either. This will create problem when the plans or its components gets obsolete or need to be changed. Another problem would arise when the duration of plans ends. It is necessary that the entire plan document (*including all planning and land use proposals*) should be reviewed every 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,

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infrastructure development, and the trend of public and private physical development including growth direction.

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

8.3 Resource Mobilization

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

8.4 Concluding Remarks

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

Chapter 9

Urban Area Plan

9.1 Introduction

This is the first chapter of **Part- B** that starts with Urban Area Plan. Urban Area Plan is the mid level plan that covers fairly, the existing urban part and the immediate surroundings of the Paurashava. It lays down the land use zoning plan and infrastructure development proposals at the town level.

9.1.1 Goal and Objectives

The Urban Area Plan is the second Part of the Jhikargachha Paurashava Master Plan and Land Use Plan is one of the four components of Urban Area Plan. The Urban Area Plan (UAP) has been prepared for managing and promoting development over medium term on the basis of the strategies set by the longer-term Structure Plan. Basically the UAP is an interpretation of the Structure Plan over the medium term (10 years). The coverage of the UAP 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 20 years. Delineation of the UAP is based on the urban growth area identified in the Structure Plan. It contains more details about specific programs and policies that require to be implemented over the medium term.

9.1.2 Methodology and Approach to Planning

The Land Use Plan preparation is based on the land use survey which 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 also representing their use. At the same time, uses of lands without structures were coded on mouza plots. Later on land use features were identified and classified using the recorded code and separated in different layers during data processing stage, from where the category-wise land use maps were prepared using the identification layers of each land use feature. The land use map has prepared indicating the broad categories of land use described in the ToR. The land use map has been prepared on CS mouza map at a scale 1"=165' (RF 1:1980) suggested by the LGED.

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

Land use maps have been prepared applying the appropriate systematic command through GIS. Landuse is transferred on CS mouza map in a scale of RF 1:1980. Land use is divided into different categories and sub-categories approved by the LGED. Land use colour and legend were also fixed by the PMO (Project Management Office) of the UTIDP, LGED. Legend contains, necessary themes, features using different symbolize schemes. As per suggestion of the LGED for fixed legend and approved format for land use, Consultants have prepared existing land use map.

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Based on the existing land use map, the land use plan has been prepared using the guidelines in by the ToR. The planning starts from formulation of strategies to issues like functional quality (meeting of space requirements for different functions, relation between functions etc., aesthetic quality, flexibility, deviation, public agency support etc.) for plan implementation. The planning in detail also covers the delineation of existing urban area and the new urban area. The Plan comprises a set of policies including a broad framework for development promotion, control and coordination.

At the **beginning** of the planning process, relevant higher-level plans were studied. The **Second step** of the plan process includes several consultations with local communities / beneficiaries and other agencies / interest groups (stakeholders). Information resulting from the consultations has summarized and included in this report as a part of explanatory report as well as a fourth overlay on the base map. **Third step** comprises formulation of planning principles and standards addressing the land use, infrastructures and utility services. This is an important stage in design process, crucial to the final functional quality of the result and its efficiency and cost effectiveness. These planning principles and standards address two distinct situations: existing urban area and new urban areas. **Fourth step** of the planning is integrated plan. The integrated plan has been formulated through the consolidation of inputs from different sectors, local leaders, interest groups, etc. At the same time assessment has been made on future economic, social and environmental impact of the integrated plan and its financial viability. The plan will be adjusted based on the significance of these impacts. The **next step** of the plan was the incorporation of development proposals with actual design. Response to the community desire, planning strategies has to be set and integrated planning maps have been prepared considering the functional quality, aesthetic quality, flexibility and environmental sustainability. **Finally**, the development proposals of the plan have prioritized and phasing out.

9.1.3 Area Delineation of Urban Area Plan

For delineation of Master Plan area, it is necessary to identify the possible future urban growth locations. The objective of project area demarcation is to determine the boundary of the area and mark it on the map as well as in the field. Logic behind the delineation of the Planning area of Jhikargachha Paurashava for the year 2031 has been done on the basis of the gazette notification of the Paurashava and after the reconnaissance survey and, Landuse and Physical Feature survey of the area, discussions with groups of stakeholders, analyzing the present trend of developmental of the town. The Paurashava authority was involved closely although the process of urban plans area delineation.

The Urban Area Plan area covers 13.18 sq km. This is the Paurashava Area where urban development is going to take place in future. Paurashava operates in this area that provides the basic urban services and facilities as preconditions for urban proliferation.

Table 9.1: Urban Area Plan Coverage

Jhikargachha Paurashava Urban Area Plan	Area	
	Sq. km	Acre
Urban Area Plan Coverage	11.08	2737.41
Percent of Structure Plan Area	100%	

The Urban Area Plan constitutes 100% of the Structure Plan area. The details have been presented in **Table-9.1** and **Map-9.1**.

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Map no. 9.1: Urban Area Map with Major Circulation and Services of Jhikargachha Paurashava

Part B: Urban Area Plan**Table 9.2: Ward wise Mouza Scheduling for Urban Area Plan**

Ward No.	Mouza Name
1	Jhikargachha 34_00
2	Kissnonagar 68_01 (part), Kissnonagar 68_02 (part)
3	Kissnonagar 68_01 (part), Kissnonagar 68_02 (part)
4	Kissnonagar 68_01 (part)
5	Kirtipur 67_01, Kirtipur 67_02 (part), Kissnonagar 68_01 (part), Mobarakpur 66_00 (part)
6	Kirtipur 67_02 (part), Mobarakpur 66_00 (part), Payradanga 65_00
7	Purandarpur 69_01 (part), Purandarpur 69_02
8	Purandarpur 69_01 (part), Barbakpur 33_03, Barbakpur 33_02 (part)
9	Barbakpur 33_02 (part), Hajirali 70_00, Kawria 72_01

9.1.4 Content and Form of Urban Area Plan

Urban area plan is broadly divided into three forms, plan map, explanatory report and GIS database. The plan map depicts the future land use zoning, infrastructure development and other development proposals. Report elaborates all the proposals made in the plan, including, rules, regulations and recommendations for implementation of the plan and GIS database supports the both plan map and reports which have originated from that database. 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.

Part- B: the Urban Area Plan is 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.

Chapter- 10 of the report covers the Land Use Plan. The Land Use Plan identifies approaches of planning, existing and projected land use and proposed land use. Requirement of land for different purposes, land use zoning and plan implementation strategies are also included here.

The Transportation and Traffic Management Plan is the **Chapter- 11** which explains 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 **Chapter- 12** of the Urban Area Plan. The chapter again is, subdivided into two parts – drainage part and environment part. Existing drainage network, land level and topography /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.

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Chapter- 13 of this report is Plan for urban services. Existing condition and demand of the services, projection of proposed urban services, proposals for urban services and implementation, monitoring are the key issues of this part.

Chapter 10

Land Use Plan

10.1 Introduction

Land use Plan is the main part of the Urban Area Plan and is planned for the period of first 10 years. The proposals in the Land use Plan will be implemented through the 1st and 2nd phase development programs of the Master Plan. The 1st phase development projects are identified as priority projects and are listed in the Ward Action Plan for implementation within the first five years of the Master Plan.

10.2 Existing and Estimated Future Land Use

10.2.1 Existing Land Use Types and Patterns

The land existing uses of the urban area that is, Paurashava area land has been grouped into 16 categories (**Table-10.1**). The land uses have been classified for Paurashava area. It is clearly evident from the table that residential land use that includes all types of dwelling houses, dominate the built up part of the Paurashava, while above half of the total Paurashava land is still under agriculture. **Map- 10.1** shows the urban area map with existing land use pattern of Jhikargachha Paurashava.

Table 10.1: Existing Land Use of Jhikargachha Paurashava

Sl. No.	Existing Land Use	Area in Acre	%
1	Agriculture	1570.78	57.38
2	Circulation Network	93.30	3.41
3	Commercial Activity	30.50	1.11
4	Community Services	5.71	0.21
5	Education & Research	20.88	0.76
6	Governmental Services	15.01	0.55
7	Manufacturing and Processing Activity	14.45	0.53
8	Mixed Use	11.69	0.43
9	Non Government Services	0.79	0.03
10	Recreational Facilities	0.16	0.01
11	Residential	737.82	26.95
12	Service Activity	10.58	0.39
13	Transport & Communication	8.93	0.33
14	Urban Green Space	21.39	0.78
15	Vacant Land	39.18	1.43
16	Water Body	156.24	5.71
Total:		2737.41	100.00

Source: Physical Feature Survey, 2009-2010

The land use of the project area has been analyzed ward wise as well as for the entire project area. Within the built up part of the town, residential land use features, that include all types of

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dwelling houses, dominate the total planning area. In respect of entire Paurashava area, the highest land use goes to agriculture (57.38%). The second major land use is residential use, and it occupies about 26.95% (737.82 acres) of the Paurashava area. Besides, there is about 5.71% water body, about 3.41% circulation network, about 1.11% commercial activities and otherwise about 0.76% of lands are being used for education, 0.55% land is used for governmental services, 0.53% land is used for industrial purposes, 0.21% of land is used for community services and 1.43% land is vacant to till.

10.2.2 Estimated Future Land Use

The Paurashava is not an ideal township in respect of land use distribution. It is dominated by agricultural land use, which is unusual. 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 town. This can be controlled through the Compact Township Development concept with the encouragement of vertical development. In case of government services, specific building may accommodate different type of offices.

Future land use has been calculated according to the development control for the masses and the standard supplied by the LGED. In case of public land, existing use and khas land have been emphasized. Willingness and participation of the people in development activities considers as a key factor for future land use demarcation. Slow change of land use emphasizes rather than rapid change. Let the people do whatever he likes on own land – such concept should not be considered for future projection of land uses. Three parts of the projection are, land use change, land use control and land use restriction is included in the Master Plan. In any case, areas of khal (canal) edge should be restricted for human habitation. As a result, khals will not be polluted and silted and these existing canals will act as uninterrupted natural drainage system and drainage outfall.

a. Basis of Estimation

The important basis of estimating the amount of land under each land use type is the size of population in different periods of the Master Plan. The distribution of existing land uses have been estimated considering the total requirement of land in future. Land for different uses have been determined on the basis of estimated future demand for each category of land use.

b. Estimation of Urban Residential Land Requirement

The present population of the planning area has been estimated as 32774 (2011) as per growth rate of 1.65%. This gives a gross density 11.97 persons/acre. The future housing area need to be based on a recommended planning standard of 100 persons per acre. With this standard, the estimation shows, the land required to accommodate total projected population (45438) in the year 2031 will be 454.38 acres. But survey of existing land use has identified 737.82 acres of land currently under residential use with a low density of population (10 persons/acre). The consultant, therefore, retracts the existing housing land for the population of the Paurashava in 2031. Moreover in Jhikargachha Paurashava, the consultants have proposed old people rehabilitation centre, planned residential areas which would not be possible to implement in existing residential zone. That is why, new or vacant or agricultural zone was used for this purpose and so the proposed residential use occupied 830.51 acres of land in total.

Jhikargachha Paurashava Master Plan must have an area delineated for housing the poor, disadvantages and refugee of climate change and other disasters to fulfil National Housing Policy, Disaster Policy and other policy prescriptions of the Government.

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Map no. 10.1: Urban Area with Existing Landuse Pattern of Jhikargachha Paurashava

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Estimation of Land for Commercial Use

There is no reason to expect any sharp rise in business activities in next 20 years in Jhikargachha Paurashava. The current land under business/trading use is only 30.50 acres including business areas beyond Paurashava that cover shopping and bazar areas. Market facilities are usually provided privately on commercial basis depending on trend of sale of goods. So it is not possible to fix a standard or project actual area for these services. Field observations shows that most commercial areas are actually mixed areas combined with residence and small scale industry. So, instead of marking commercial areas exclusively for commerce use (that would never develop in this small town), it is better to term the area as mixed use area and allow it to develop as mixed use areas. Five categories under the title of Commerce and Shopping are considered in the Planning Standard; Wholesale, Retail, Corner shop, Neighborhood and Super Shop. Last three categories are actually homogeneous on the basis of retail commerce. As a result, demanding land for corner shop, neighborhood market and Super shop will allocate from the land accounted for retail market.

Every wholesale market requires space for at least three major activities along with utilities and services. The activities are: stockyard, loading-unloading yard and parking. Usually single wholesale market is enough for most of the small towns like Jhikargachha having population not more than 20000 to 30000.

Shops, loading-unloading yard, parking and dropping zone are the major space requirements along with utilities and other services for an independent retail market. A modern retail market should, compact, vertically developed and functional. One acre land is likely to be reasonable to develop a planned retail market that can serve easily 3 to 5 thousand populations.

For the sake of current planning the consultant can earmark land as per standard for commercial land use and put them at appropriate locations where mixed use facilities may be developed privately or publicly. The required commercial lands for wholesale market is 4.54 acres, 45.44 acres for retail sell market. So the consultants have kept in total 60.48 acres of lands for wholesale market, retail sell market, corner shops, neighborhood markets and super markets.

e. Estimation of Land for General Industrial Zone

According to approved planning standard the total land for industries comes to 113.60 acres with 68.16 acres for small scale industries and 45.44 acres for cottage and agro based industries. Currently total land for industrial uses stands for 14.45 acres. Rice mills, Saw mills, Ice factories, Seed processing industries, bakery factories are the main element of industrial base in Jhikargachha Paurashava. Presently no heavy or general industrial base has been grown in Jhikargachha Paurashava. So the consultants have currently proposed 70.88 acres of lands for industrial uses though as per planning standard, 113.60 acres of lands are needed.

f. Education & Research Zone

Estimation of land for education and research, according to standard, indicates there will be a land requirement of 75.89 acres to accommodate educational and related facilities by the year 2031. Currently Jhikargachha Paurashava occupies only 20.88 acres of lands in this category. So the consultants have proposed 69.80 acres of lands though as per planning standard, 75.89 acres of lands are needed.

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g. Health Services

There already exists an Upazila health complex on an area of 5.52 acres. Estimate shows 10 acres of land for the health complex according to recommended standard. The consultant feels that no additional land is required for the Upazila health complex for a Paurashava like Jhikargachha. So no additional land is proposed for the facility. In future, as the population and density increases, demand for local health facilities will increase. So according to standard, 4.014 acres of additional lands have been allotted for Health centre/Maternity clinic. It is expected that a large part of the health services will be provided by the private sector.

h. Open Space

Field survey shows no public park or play field in the town for use by general public except play grounds in the premises of educational institutions. Total recommended land required for various open space recreation facilities stands at 104.97 acres. The facilities include, play field/ground, parks of various categories and stadium/sport complex. The consultants proposed overall 181.38 acres of lands for open space. Besides required lands as per planning standard, the proposed lands for open space have been much higher due to the reason that the lands between Kopotakkho river and proposed embankment along both side of that river have been kept as open space.

i. Circulation Network

In the Paurashava, 93.30 acres (3.41%) of land is under regional and local roads within the Paurashava. In total 387.65 acres of land will be needed for proposed roads as per demand by the Paura Porishad (including widening, link and new roads) up to the year 2031. This area will constitute a total of 14.16% land under circulation network within the Paurashava by 2031.

j. Transportation Facilities

In the field of transport establishment the consultant proposes such facilities as, bus terminal, truck terminal, rickshaw stands at selected places, baby taxi/tempo stand and passenger shed for local bus users. These categories of land uses required 21.26 acres of lands where there is only 0.95 acres of land under this category with one existing railway station (0.58 acres). So for this purpose additional 16.43 acres of land will be required up to the year 2031. Please see **sub-section 4.4.7 of Chapter- 4**. However, many of the proposals may seem pre matured, but will be necessary in future. If land acquisition for these facilities is delayed, land may not be available in future for providing such facilities.

k. Government Office

Land for administration is meant for public sector and other office activities. The required land for Upazila complex is 15.00 acres of land and there is 2.74 acres of land available. The land required for Jail/sub-jail is 10.00 acres and there is no such existing land.

The existing land of Jhikargachha Paurashava Office premise is situated in an area of 0.21 acres, while the prescribed standard requires a range of 3.00 – 5.00 acres of land for this purpose. Consultant considers that this is not enough for Jhikargachha Paurashava. There is land nearby that can be proposed for extension. If necessary, additional space can be created by constructing a high rise building. So no additional land has been proposed.

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Other Government Offices (Police Station, Police Box/Outpost, Fire Station, Post Office) Requires 8.14 acres of land as per standard where there is already exists 2.77 acres of Police station and 0.53 acres of Post Office.

I. Community Facility

For various community facilities, the land requirement has been fixed at 7.95 acres. 1.14 acres have been earmarked for Mosque and Temple, 2.27 acres for Eidgah and 2.27 acre for Graveyard. The existing coverage area of Mosque/Church/Temple is exceeds the standard requirement. There is 2.67 acres of graveyard in Jhikargachha Paurashava but all these lands are under mosque or family based and not centrally or publicly provided. For details, please see **sub-section 4.4.9** of Chapter- 4.

m. Utility Service

A number of utility establishments are required in a town to run services properly. The consultant, according to approved standard, has earmarked 2.27 acres for water supply installations, like, pump stations and other establishments related to water supply; there will be 9 waste transfer stations for collection of solid waste located at suitable locations. Each ward will have one station. So there will be need for 2.93 acres for 9 transfer stations. A dumping site will be developed over an area of 4.9 acres for final disposal of the solid waste. For electric power sub-station the estimated land is 0.76 acres. For telephone exchange office, estimated land is 1.14 acres where the existing land is 0.88 acres. It has been assumed that mobile phone plays a vital role in communicating than land phones. That is why no proposal was made in this connection. The total land requirement under this category is 18.62 acres.

n. Recreational Facility

There is no indoor recreation facility in Jhikargachha. There is a cinema hall with 0.14 acres.

o. Agriculture

Existing total area under agricultural use is 1570.80 acres and it is the 57.38% of the total Paurashava area. After implementation of the Urban Area Plan up to the year 2031, it will be reduced to 776.72 acres and it will become 28.38% of the Paurashava area during the end of the plan period.

p. Rural Settlement

Most of the Upazila level towns in Bangladesh, including Jhikargachha, are rural based. It is unlikely that all the lands under agriculture will be converted to urban during the project period. This residential area will remain as rural settlement area with low density and limited urban services. This area will have a density of maximum 20 – 30 persons per acre. For the project period, a total of 12.49 acres of land or 0.46% of the total Paurashava area has been earmarked as rural settlement area.

q. Urban Deferred

The Urban Deferred refers to lands lying outside of the urban growth boundary and identified as Urban Deferred and encompassed by the Urban Deferred Boundary. According to planning standard provided by LGED seeks about 10 percent of the total build up area. The total area under this use has been proposed as 81.2 acres that include existing and proposed land uses. Livestock and vegetation based agriculture and existing facilities up to the date of gazette notification of the master plan are permitted uses within the Urban Deferred Zone.

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144.42 acres of land within the Paurashava area are proposed as water body and retention area and it is the 5.28% of the total Paurashava area.

Other 7 categories of land use, (Heavy industrial zone, historical and heritage site, restricted area, overlay zone, forest, beach and miscellaneous) are not existed as well as proposed in Jhikargachha Paurashava.

Table 10.2: Proposed Land use within Jhikargachha Paurashava

Proposed Land Use		
Land Use Category	Area in Acre	Area (%)
Agricultural Zone	776.70	28.37
Circulation Network	387.69	14.16
Commercial Zone	69.71	2.55
Community Facilities	28.06	1.03
Education & Research Zone	69.8	2.55
Government Services	23.96	0.88
General Industrial Zone	57.61	2.10
Heavy Industrial Zone	13.28	0.48
Health Services	9.72	0.36
Mixed Use Zone	10.41	0.38
Recreational Facilities	0.14	0.01
Open Space	181.34	6.63
Urban Residential Zone	830.51	30.34
Rural Settlement	12.49	0.46
Transportation Facilities	21.26	0.78
Urban Deferred	81.2	2.97
Utility Services	18.62	0.68
Water Body	144.42	5.28
Miscellaneous	0.5	0.02
Total	2737.41	100

10.3 Land Use Zoning and Development Control

Development control is an essential part of urban planning. For development control certain rules have to be followed for approval of designs of various categories of structures, establishments and land uses. The first condition is to secure land use permit according to approved zoning plan followed by approval of the design of proposed building/structure.

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10.3.1 Land Use Zoning

In land use zoning, the entire area of a town is divided into suitable land use zones to create congenial activity and livable environment and thereby enhance land use functions and value. In Bangladesh such land use zoning is incorporated as a part of the master plan / land use plan/urban area plan. Before submitting building plans for approval an applicant must secure land use permit from the Paurashava. For land use permit, an applicant's prospective use of structure must be compatible with the approved land use zone of the site. Land use zoning limits activities that can or cannot function on a land parcel by establishing a range of development options. Land use zoning is a legal instrument by application of which a Paurashava can control,

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

Zoning can be of three types, area zoning, density zoning and height zoning.

Area Zoning

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

Density Zoning

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

Height Zoning

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

Considering the existing level of development and development prospects and the location of the project area, consultant recommends following the area zoning only.

Zoning is only a part of development control regulations. A prospective developer in a Paurashava has to comply with other rules and regulations, like, Building Construction Rules, 1996 under East Bengal Building Construction Act 1952, Bangladesh National Building Code 1993 and other conditions of construction method, building safety and associated issues.

10.3.2 Land Use Zone Classification

After a detailed consultation between the PMO and the consultants of the project, the land use classification for the Paurashava Master Plan has finalized. The followings are the finalized land use zone classification recommended by the PMO.

- 1) Urban Residential Zone
- 2) Rural Settlement
- 3) Commercial Zone
- 4) Mixed Use Zone

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- 5) General Industrial Zone
- 6) Government Office
- 7) Education & Research Zone
- 8) Agricultural Zone
- 9) Water body
- 10) Open Space
- 11) Circulation Network
- 12) Transportation Facilities
- 13) Utility Services
- 14) Health Services
- 15) Community Facilities
- 16) Urban Deferred
- 17) Recreational Facilities
- 18) Forest
- 19) Beach
- 20) Miscellaneous
- 21) Heavy Industrial Zone
- 22) Historical and Heritage Site
- 23) Restricted Area
- 24) Overlay Zone

First 17 land uses zoning of the above list are available and proposed for Jhikargachha Paurashava Master Plan and the above 18-20, 22-24 will not be applicable for Jhikargachha. In the sections below, the general definition of the use and description of associated permitted and conditionally permitted uses under each land use zone have been provided. The uses that are not listed here in any of the categories shall be treated as **Restricted 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 recommended land use zones.

1) Urban Residential Zone

Urban residential zone refers to all categories of urban residential areas, including existing ones and the residential land use proposed under the present master plan. This includes single family housing or multi-family residential. Zoning for residential use will permit some services. It will permit high density land use. In total this zone covers 830.51 acres (30.34% of the existing Paurashava area) of land delineated up to the year 2031, considering standard provided by LGED. This zone will allow commercial uses as listed in **Table-A.1, Annexure B**, and conditional uses as listed in **Table-A.2, Annexure B**.

Table 10.3: New Development proposal for Urban Residential

Type of Facilities	Ward No.	Mouza Name	Plot No.	Area (acre)
Low Cost Housing	01	Jhikargachha	885, 926, 927, 928, 932-944, 948, 949, 950, 955-967, 979, 989, 990, 991, 1183, 1184	10.71
Low Income Housing	06	Mobarakpur	115, 116, 117, 118, 119, 120, 121, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 186, 187, 188,	13.50

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Type of Facilities	Ward No.	Mouza Name	Plot No.	Area (acre)
			189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 252, 253, 254, 255, 256, 259, 260, 261, 262, 263, 268, 269, 270, 272, 273, 274, 275, 276, 277, 278, 465, 480	
Resettlement Area	06	Mobarakpur	1, 4, 84, 85, 86, 87, 88, 89, 146, 147, 148, 149, 150, 157	2.36
	08	Barbakpur (33/02)	1615, 1616, 1617, 1652	2.44
		Barbakpur (33/03)	1714, 1715, 1716, 1723, 1724, 1725, 1726, 1734, 1735, 1736, 1737, 1738, 1739, 1746	
Resettlement Area for Old People	06	Mobarakpur	82, 83, 84, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 121, 122, 123, 124, 125, 140, 144, 146, 480	6.69
Total:				35.70

2) Rural Settlement

Rural settlement includes the low dense residential area which is scattered within Paurashava boundary and rural in nature. This use will have only low density uses and only up to double story building will be permitted aiming to control the growth in this zone. Less service and facilities will be provided. The zone of rural settlement is intended to provide locations, where rural settlement including agriculture can be set up and function. Without creating hazards and changes to surrounding land uses. This zone has an area of 15.76 acres (0.48% of the existing Paurashava area) designated up to 2031. This zone will allow rural residential uses as listed in **Table-A.7, APPENDIX-5**, and conditional uses as listed in **Table-A.8, APPENDIX-5**.

3) Commercial Zone

The land used for commercial activities is considered as commercial land use. These activities include the buying and selling of goods and services in retail businesses, wholesale buying and selling, financial establishments, and wide variety of services that are broadly classified as "Business". Commercial land includes established markets and areas earmarked for markets. The commercial zone is intended to provide locations which can function without creating hazards to surrounding land uses. This zone has an area of 69.71 acres (2.55% of the existing Paurashava area) designated up to 2031. This zone will allow commercial uses as listed in **Table-A.5, Annexure B**, and conditional uses as listed in **Table-A.6, Annexure B**. Following table shows the ward wise plot schedule for commercial activities.

Table 10.4: New Development proposal for Commercial Activities

Type of Facilities	Ward No.	Mouza Name	Plot No.	Area (acre)
Neighborhood Market	01	Jhikargachha	191, 466, 467, 468, 469, 471, 472, 474, 475, 476, 477, 479, 483, 484, 485	1.96
	04	Krishno Nagar	388, 389, 390, 474, 475, 476, 477, 483, 500	1.30
	05	Kirtipur	546, 547, 548, 549, 550, 551, 555, 556, 557, 565, 566, 567, 568, 992	6.14
	06	Pairadanga	31, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47,	5.78

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Type of Facilities	Ward No.	Mouza Name	Plot No.	Area (acre)
			48, 49, 50, 51, 52, 53, 59, 60, 61, 62, 67, 69, 109, 110, 111, 112	
	07	Purandarpur	279, 297, 298, 299, 300, 301, 302, 303, 320, 321, 325, 326, 327, 329, 330	1.34
	08	Barbakpur	2162, 2163	1.88
		Purandarpur	120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 142, 278, 279, 299, 300, 301, 380	
	09	Hajirali	401, 403, 404, 405, 406, 416, 417, 418, 420, 422, 423, 424, 425, 427, 428, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 612, 613	5.93
		Purandarpur	19, 20, 22, 23, 24, 172, 173, 180, 181, 182, 183, 192, 194, 195, 196, 197, 199, 200, 201, 202, 203, 215, 380	
Super Market	07	Purandarpur	318, 319, 320, 330	0.951
Whole Sale Market	08	Purandarpur	42, 52, 53, 54, 55, 56, 57, 58, 60, 71, 72, 73, 74, 75, 167	2.49
	09	Purandarpur	26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 43, 44, 45,	7.74
Cattle Hat & Slaughter House	08, 09	Purandarpur	5, 42-53	4.47
Total:				40.01

4) Mixed Use Zone

Mixed use zones have been recommended to allow some flexibility in development. In a small town like Jhikargachha, as the trend shows, an exclusive commercial land use is unlikely to function. Admixture of land uses will allow flexibility of development, instead of restricting development to any particular use. Total area earmarked for mixed uses stands at 10.41 acres (0.38% of the existing Paurashava area). This zone will allow residential structures together with commercial uses as listed in **Table-A.11, Annexure B**, and conditional uses as listed in **Table-A.12, Annexure B**.

5) Industrial Zone

General industries are the Green and Orange A categories of industries as per The Environment Conservation Rules, 1997. The general industrial zone is intended to provide locations, where general industrial establishments can be set up and function without creating hazards to surrounding land uses. As a small urban centre it is unlikely that any major industrial concern will find its place here in the immediate future. This zone has an area of 56.43 acres excluding existing 14.45 acres of small scale and agro-based industries (poultry saw mills and rice mills mainly), designated up to 2031. So, total industrial land use will stand at 70.88 acres (2.58% of the existing Paurashava area). Since there is no industrial agglomeration in the town, the industrial zone will be meant for new industries. In this zone a complex line of industrial and supporting non-industrial land uses will be permitted as per **Table-A.3, Annexure B** and conditional permission will be given to a number of other land uses as specified in **Table-A.4, Annexure B**. Following table shows the ward wise plot schedule for general industrial use.

Part B: Urban Area Plan**Table 10.5: New Development proposal for Industry**

Type of Facilities	Ward No.	Mouza Name	Plot No.	Area (acre)
General Industrial Area	1	Jhikargacca (34_00)	671, 718, 720, 724, 725, 726, 755, 756	57.61
	9	Barbakpur (33_02)	1402, 1427-1454, 1457, 1458, 1459, 1460, 1554-1559	
Heavy Industry	1	Jhikargacca (34_00)	884-929	13.28
	5	Kirtipur	313	
Total:				70.89

6) Government Office

Government Office zone covers all kinds of government offices including existing and proposed (e.g. proposed neighbourhood centre) in the town. The existing government offices are Upazila Tahsil Office, Upazila Agriculture Office, Upazila Livestock Hospital, PDB Office, Police Station, Post Office, Paurashava Office, Sub-registry Office, T & T Office, and Upazila Parishad Office. The proposed Government Offices are nine neighbourhood centres for eight wards except ward number 03 and 7 police box/outpost. The permitted uses in this zone is presented in **Table-A.15, Annexure B** and conditional uses as listed in **Table-A.16, Annexure B**. The total area under this use has been proposed at 23.96 acres (0.88% of the existing Paurashava area) that include existing and proposed land uses. Following table shows the wardwise plot schedule for government office use.

Table 10.6: New Development proposal for Government Office

Type of Facilities	Ward No.	Mouza Name	Plot No.	Area (acre)
Police Box	01	Jhikargachha	993, 995, 996	0.26
	05	Kirtipur	573, 575, 991	0.076
Ward Councilor's Office	01	Jhikargachha	468, 469	0.38
	02	Barbakpur	1729	0.046
		Krishno Nagar	812, 820, 956	
	03	Krishno Nagar	232, 233, 249	0.26
	04	Krishno Nagar	391	0.206
	05	Kirtipur	575, 991	0.28
	06	Mobarakpur	5, 406, 407	0.30
	07	Purandarpur	320, 321	0.14
	08	Barbakpur	1729	0.93
		Krishno Nagar	820	
		Purandarpur	99, 100, 101, 159, 160, 186, 187	
	09	Purandarpur	24-27, 169, 170, 172	0.93
Paurashava Office	05	Kirtipur	547, 572, 632-642	3.17
Total:				6.978

Part B: Urban Area Plan**7) Education & Research Zone**

Educational & Research zone refers to mainly education & research and other social service facilities as listed in **Table-A.13, Annexure B**, and conditional uses as listed in **Table-A.14, Annexure B**. The total area under this use has been determined as 69.80 acres (2.55% of the existing Paurashava area) that includes existing, newly proposed land uses and expanding land for existing educational institutions. 3 new primary schools (ward no. 06, 07, 09), two new High schools (ward no. 07, 09), 1 vocational institute (ward no. 01) and two new colleges (ward no. 05, 09) are proposed and other existing institutes are recommended to strengthen their status through vertical expansion and conversion of non-government institutions to MPO. Following table shows the ward wise plot schedule for education & research use zone.

Table 10.7: New Development proposal for Education & Research

Type of Facilities	Ward No.	Mouza Name	Plot No. (Part)	Area (acre)
College	05	Kirtipur	479, 480, 481, 483, 484, 488, 489, 490, 491, 492, 493, 494, 495, 496	3.50
High School	09	Hajirali	187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 203, 204, 207, 208, 612	6.1
	07	Purandarpur	626, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 658, 659, 660, 661, 662, 680, 698, 699	6.76
Girl's College	09	Hajirali	227-230, 320-323, 337-343, 345-351, 608	2.92
Nursery School	07	Purandarpur	609, 612-619	2.73
Primary School	09	Barbakpur	1597, 1598, 1607, 1622, 1623, 1624, 1625, 1629, 1630, 1631, 1632, 1641, 1658	1.7
	06	Pairadanga	110-114, 117-122, 124, 125, 138, 140, 141, 142, 143, 144, 145, 180	4.55
	07	Purandarpur	605, 607-609, 617, 619, 621-628, 636, 698, 699, 700, 701	4.72
Vocational Training Institute	01	Jhikargachha	216-224, 226, 228, 312, 363, 366-382, 425-437, 442, 448-457, 463-466, 1209	14.5
Total:				47.48

8) Agricultural Zone

Agricultural land denotes the land suitable for agricultural production, both crops and livestock. It is one of the main resources in agriculture. It includes productive land (single, double and triple cropped), seed bed, fisheries, poultry farm, dairy farm, nursery, horticulture etc. The Paurashava has a vast area of agricultural land that demands formation of a separate zone like, agriculture zone. Agriculture zone is primarily meant for agriculture; land uses related to it and land uses that support it. Details of land uses is presented in **Table-A.17, Annexure B** and conditional uses as listed in **Table-A.18, Annexure B**. The total area will stand at 776.72 acres (28.37% of the existing Paurashava area) after the urban area plan is implemented within 2031.

9) Water body

144.42 acres or 5.28% of the existing Paurashava area is indicated as water body. These will act as water retention areas which include ponds, water tanks, natural khals and irrigation canals. The plan suggests preserving most of these water bodies for two purposes, first, to serve as source of water, second to serve as water retention area during monsoon. The ponds with an area equal to or more than 0.20 acres will be preserved as the water retention ponds. There will be permitted

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uses in this zone as stated in **Table-A.23, Annexure B** and allow some other uses conditionally as stated in **Table-A.24, Annexure B**.

Water courses are the water flow paths or the existing natural water courses that carry storm water and waste water. These are the existing khals. These facilities should not be allowed to such that endanger their existence and use. In order to preserve them and keep them functional only the uses as suggested in **Table-A.21, Annexure B** will be permitted. Some other uses will be permitted on conditions as suggested in the list put in **Table-A.22, Annexure B**.

10) Open Space

Recreational and sport facilities without or with minimum building structure i.e. Playground, Botanical Garden, Stadium, Zoo etc. will be listed and proposed under Open Space zone. This zone has been provided to meet the active and passive recreational needs of the people and at the same time, conserve the natural resources. The total area earmarked for this zone stands at 181.38 acres (6.63% of the existing Paurashava area). The details of permitted and conditional permits have been presented in **Table-A.19, Annexure B** and conditional uses as listed in **Table-A.20, Annexure B**. Following table shows the ward wise plot schedule for Open Space zone.

Table 10.8: New Development proposal for Open Space

Type of Facilities	Ward No.	Mouza Name	Plot No.	Area (acre)
Central Park	7	Purandarpur (Sheet 01)	334-340, 355	34.23
		Purandarpur (Sheet 02)	451, 874, 875, 876, 878, 879, 880, 881, 882, 883, 884, 886, 893, 895, 896, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 936, 937, 938, 939, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951	
Park	1	Barbakpur (Sheet 02)	1654	40.74
		Barbakpur (Sheet 03)	1729	
		Jhikorgacha	191, 333-339, 346-362, 383-396, 401-421, 470, 917, 929-931, 968-978, 981, 984, 1005, 1006, 1008, 1009, 1010, 1011, 1020, 1021, 1022, 1023, 1024, 1028, 1152, 1154, 1157-1165, 1190, 1206, 1208, 1211, 1219	
		Kirtipur	1, 308, 309, 313	
		Krishno Nagar	1, 2, 3, 4, 5, 48, , 49, 50, 54, 55, 56, 74, 181, 182, 183, 184, 567, 568, 569	
Neighborhood Park	1	Jhikorgacha	456, 463	0.948
Neighborhood Park	2	Barbakpur (Sheet 03)	1729	1.94
		Krishno Nagar (Sheet 01)	211, 215, 217, 218, 276, 278, 287, 288, 290, 293, 296, 545, 555, 569	
		Krishno Nagar (Sheet 02)	795, 796, 797, 798, 799, 800, 808, 820, 821, 952, 954, 955	
Neighborhood Park	3	Krishno Nagar (Sheet 01)	181, 376, 379, 380, 381, 383, 396, 397	0.72

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Type of Facilities	Ward No.	Mouza Name	Plot No.	Area (acre)
Neighborhood Park	5	Kirtipur (Sheet 01)	1, 2, 3, 10, 11, 12, 13, 65, 66, 67, 68, 69, 75, 80, 81, 84, 85, 299, 308, 309, 311, 312, 313	16.50
		Kirtipur (Sheet 02)	575, 576, 577, 578, 588, 590, 591, 592, 593, 594, 595, 598, 599, 629, 630	
		Krishno Nagar (Sheet 01)	1, 2, 3	
Neighborhood Park	6	Krishno Nagar (Sheet 02)	924, 934, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947	13.16
		Mobarakpur	12, 293, 296, 297, 298, 299, 300, 379, 380, 381, 382, 426, 427, 428, 429, 430, 431, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 450, 451, 452, 460, 461, 462, 463, 464, 468, 469	
		Pairadanga	676, 679, 680, 681, 682, 683, 687, 688, 689, 690, 691, 701-717, 732-745, 787-799, 802, 803, 804, 806, 807, 808, 809, 810, 811, 812, 813, 816	
		Purandarpur (Sheet 02)	2043	
Neighborhood Park	7	Mobarakpur	12, 427, 429, 430, 433, 436, 437, 438, 439, 440, 452, 461, 462, 463, 469	0.22
		Pairadanga	679, 680, 689, 703, 704, 707, 737, 738, 739, 790, 792, 793, 794, 795, 803, 804, 809, 810, 811, 812, 816	
		Purandarpur (Sheet 02)	2042, 2043	
Neighborhood Park	8	Barbakpur (Sheet 02)	1654	8.00
		Barbakpur (Sheet 03)	1729, 1940, 1941, 1945-1960, 2070-2074, 2076, 2079, 2080, 2081, 2082, 2088, 2089, 2132, 2133, 2134, 2135, 2140, 2141, 2142, 2143, 2147, 2148, 2149, 2150, 2160, 2161, 2162, 2174	
		Jhikorgacha	333, 338, 356, 357, 385, 387, 389, 390, 402, 404, 408, 409, 412, 413, 1152, 1163	
			211, 215, 217, 218, 276, 278, 287, 288, 290, 293	
		Krishno Nagar (Sheet 02)	798, 799, 800, 820, 952, 954, 955	
Neighborhood Park	9	Purandarpur	16, 19 (p)	0.67
Playground	1	Jhikorgacha	820, 821, 825, 953, 994	1.04
	3	Krishno Nagar (Sheet 01)	234, 240, 242, 249	0.77
	5	Kirtipur (Sheet 02)	470, 471, 472, 473, 474, 475, 476, 482, 585, 586, 587, 589, 590, 600	2.73
	6	Mobarakpur	145-148, 167, 168, 170, 171, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 277, 279, 280, 281, 282, 283, 284, 285, 286, 287, 304, 306, 307	5.73
	7	Purandarpur (Sheet 02)	619, 620, 661, 662, 678, 679, 680, 681, 682, 683, 684, 685, 688, 689, 690, 691, 692, 693,	9.77

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Type of Facilities	Ward No.	Mouza Name	Plot No.	Area (acre)
			694, 695, 696, 697, 698, 699, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 732, 773, 1502	
	8	Purandarpur (Sheet 01)	65, 66, 67, 68, 69, 78, 79, 80, 83, 91, 92, 93, 94, 95, 96, 98, 160, 161, 162, 163, 164, 165, 166	6.59
	9	Hajirali	215, 216, 218-239, 241, 242, 245, 252-255, 319-325, 337-343, 345, 346, 347, 348, 349, 350, 351, 606, 608	8.63
Stadium	1	Jhikorgacha	223, 225, 226, 235, 236, 237, 238, 275, 294, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450	12.43
Total				164.818

11) Circulation Network

In total 387.65 acres or 14.16% of the existing Paurashava area (including 93.30 acres of existing circulation network) has been proposed for circulation network for 2031. Road network including primary, secondary, tertiary and local access road falls under this category. Following table shows the ward wise plot schedule for circulation network zone.

12) Transportation Facilities

Under transportation facilities, both transport and communication services are considered. This category includes, bus terminal/ stand, filling station, garage, passenger shed, ticket counter, transport office, etc. The plan proposed one bus terminal and one truck terminal at ward no 05. Besides, 3 bus stands have been earmarked at different locations, 1 point is indicated for parking, 3 Auto-rickshaw/tempo stands and 1 bus terminal is proposed here for Jhikargachha Paurashava. Following table shows the ward wise plot schedule for Transportation Facilities zone.

Part B: Urban Area Plan**Table 10.9: New Development proposal for Transportation Facilities**

Type of Facilities	Ward No.	Mouza Name	Plot No.	Area (acre)
Bus Stand	01	Jhikargachha	216, 1055, 1063	0.38
	05	Kirtipur	547, 642, 654, 655, 656, 657, 984	0.86
	09	Hajirali	85	0.64
		Purandarpur	1, 2	
Bus Terminal	05	Kirtipur (Sheet 01)	121, 124, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 195, 196, 197, 198, 199, 200, 201	5.36
		Kirtipur (Sheet 02)	445-448, 820	
Parking Area	01	Jhikargachha	1164, 1165, 1166, 1167, 1168, 1169, 1170, 1171, 1172, 1173	1.61
	05	Kirtipur	547, 570, 571, 572	1.64
Tempo Stand	01	Jhikargachha	1063, 1064	0.11
	05	Kirtipur (Sheet 02)	544, 545, 546, 982, 992	0.40
	09	Purandarpur (Sheet 01)	1, 2, 3	0.51
Truck Terminal	05	Kirtipur (Sheet 01)	48, 57, 102, 103, 116, 117, 118, 119, 120, 121, 122, 124, 142, 143, 144, 145	6.36
		Kirtipur (Sheet 02)	547, 565, 567	
Rail Station	06	Mobarokpur	4,5,294	3.23
		Krishnonogor (Sheet 02)	753	
Total:				21.10

13) Utility Services

A number of utility establishments are required in a town to serve the people. Utility services include Overhead Tank, Power Office/Control Room, Public Toilet, Sewerage Office, Waste Disposal, Water Pump House, Water Reservoir, Water Treatment Plant, Waste transfer station etc. The consultant has earmarked area for water supply installations, like, pump stations and other establishments related to water supply. There will be 9 waste transfer stations for collection of solid waste located at suitable locations in each of the wards. A dumping site will be developed over an area of 4.90 acres for final disposal of the solid waste proposed at the east part of ward no 01 (Jhikargachha Mouza).

Table 10.10: New Development proposal for Utility Services

Type of Facilities	Ward No.	Mouza Name	Plot No.	Area (acre)
Electric Sub Station	3	Krishno Nagar (Sheet 02)	667, 668, 677, 679	0.76
Solid Waste Dumping Site	1	Jhikargachha	274-293	4.90
Waste Transfer Station	1	Jhikargachha	191, 997, 998	0.61
	2	Krishno Nagar (Sheet 01)	280	0.06

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Type of Facilities	Ward No.	Mouza Name	Plot No.	Area (acre)
	3	Krishno Nagar (Sheet 02)	663, 664	0.18
	4	Krishno Nagar (Sheet 01)	477, 479, 480, 481, 482	0.11
	5	Kirtipur (Sheet 02)	545, 546, 547, 982, 992	0.41
		Krishno Nagar (Sheet 01)	479, 480, 481, 482	
	6	Pairadanga	9, 12, 13, 29, 30	0.55
	7	Purandarpur (Sheet 01)	332	0.11
	8	Barbakpur (Sheet 03)	2127, 2128	0.27
	9	Purandarpur (Sheet 01)	12, 14, 15, 16	0.59
Water Treatment Plant	8, 9	Barbakpur (Sheet 03)	1965, 1969-1986, 1990-2024, 2177, 2178, 2179	9.98
Total				18.53

14) Health Services

The zone of health care facilities is intended to provide locations, where health facilities including Upazila health complex and other maternity clinic can be set up and function. Without creating hazards to surrounding land uses. This zone has an area of 9.72 acres designated up to 2031. Maternity and Child health facility will be available at each Ward Councillor's Office along with other facilities hence, neighbourhood centres will be developed vertically. This zone will allow rural residential uses as listed in Table-A.9, APPENDIX-5, and conditional uses as listed in Table-A.10, APPENDIX-5. Following table shows the wardwise plot schedule for health services zone.

Table 10.11: New Development proposal for Health Services

Type of Facilities	Ward No.	Mouza Name	Plot No.	Area (acre)
Health/Maternity Centre	01	Jhikargachha	463, 465, 466, 467, 468	0.56
	02	Barbakpur (Sheet 03)	1729 (p)	0.04
		Krishno Nagar (Sheet 02)	820 (p)	
	03	Krishno Nagar (Sheet 01)	233, 235, 236	0.25
	06	Mobarakpur	414, 415, 416, 422, 423, 424, 425, 426 (p)	0.6

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Type of Facilities	Ward No.	Mouza Name	Plot No.	Area (acre)
	07	Mobarakpur	426 (p)	0.16
		Purandarpur (Sheet 01)	315, 319, 330, 331	
	08	Barbakpur (Sheet 03)	1729 (p)	1.21
		Krishno Nagar (Sheet 02)	820 (p)	
		Purandarpur (Sheet 01)	91, 93, 94, 96, 97, 98	
	09	Purandarpur (Sheet 01)	6, 19 (p), 20, 21, 22, 25, 26, 380	1.18
Total:				4.0

15) Community Facilities

All community facilities, including funeral places (i.e. graveyards) and other religious uses denoted as community facilities. This is zone earmarked with an area of 28.06 acres (including existing and proposed) designated up to 2031 and it covers about 1.03% of the existing Paurashava area. Following table shows the ward wise plot schedule for Community Facilities zone.

Table 10.12: New Development proposal for Community Facilities

Type of Facilities	Ward No.	Mouza Name	Plot No.	Area (acre)
Central Eidgah	4	Krishno Nagar (Sheet 01)	415-418, 426, 429-436, 459, 460, 461, 462, 463	4.53
Central Graveyard	7,8	Purandarpur (Sheet 01)	246-251, 258, 260, 262, 263, 265, 266, 267, 268-298, 332, 374, 379	8.95
		Purandarpur (Sheet 02)	446	
Community Centre	1	Jhikargachha	463, 468, 469	0.44
	2	Barbakpur (Sheet 03)	1729 (p)	0.046
		Krishno Nagar (Sheet 02)	820 (p)	
	3	Krishno Nagar (Sheet 01)	235, 236, 237, 240, 241	0.28
	4	Krishno Nagar (Sheet 01)	390, 474	0.22
	6	Mobarakpur	407, 412 (p), 413 (p), 414 (p)	0.31
	7	Mobarakpur	412 (p), 413 (p), 414 (p)	0.16
		Purandarpur	311, 318, 320, 321	
	8	Barbakpur (Sheet 03)	1729 (p)	0.51
		Krishno Nagar (Sheet 02)	820 (p)	
		Purandarpur (Sheet 01)	91, 97, 98, 99, 100, 101, 108, 109	

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Type of Facilities	Ward No.	Mouza Name	Plot No.	Area (acre)
Crematorium	8	Barbakpur (Sheet 03)	1729, 1732, 1740, 1741, 1742, 1743	0.81
Eidgah	1	Jhikargachha	953, 954, 992, 994	1.53
Total				17.79

16) Urban Deferred

According to planning standard provided by LGED seeks about 10 percent of the total build up area. The total area under this use has been proposed as 114.2 acres or 3.51% of the existing Paurashava area that include existing and proposed land uses. A portion of this zone may use for housing of the poor, disadvantages and refugee for climate change and other disasters to fulfil National Housing Policy, Disaster Policy and other policy prescriptions of the Government. The following are permitted Uses within the Urban Deferred (UD) Zone:

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

17) Overlay Zone

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

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

- **Environmental Protection Area**

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

- **Graveyard Sites**

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

- **Sports and Recreation Sites**

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

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○ Special Use Sites

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

Following **Map- 10.2** shows the urban area map with proposed land use pattern of Jhikargachha Paurashava.

10.4 Plan Implementation Strategy

10.4.1 Land Development Regulations to Implement the Land Use Plan

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

Implementation of the Land use Plan depends on successful pursuit of the policies specified in the Structure Plan. Those policies represent a significant challenge faced 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) Ordinance, 2009 for controlling physical development. This poses a serious constraint to the implementation of the Land use Plan and in fact any other form of development plans.

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

Prior to introduction of the regulations to implement the land use plan, following legislative measures are recommended.

1. Impose control on all types of buildings in the Paurashava according to the setback rule prescribed in the Building Construction (Amendment) Rules, 1996 (Notification No. S. R. O. No. 112-L/96). Building permission for extended areas shall be according to the land use provision prescribed in the plan. Any permission for building construction, front road width shall not be less than 24 ft. and the construction must follow the Building Construction (Amendment) Rules, 1996.
2. To control the air, water, noise and soil pollution, Conservation of Environment and Pollution Control Act, 1995 (Act No. I of 1995) was enacted. In the Paurashava, there is no authority for enforcing the provisions prescribed in the said Act. The pollution related with the implementation of land use component may be controlled with this Act.
3. Haphazard development of commercial activities is the general scenario of the Paurashava. It is necessary to impose control on commercial activities provisioned in the Shops and Establishments Act, 1965 (Act No. VII of 1965).
4. In case of man-made canal, regulations prescribed in the Canal and Drainage Act, 1873 (Act No. VIII of 1873) is the best weapon. For the linking of canal with others and river considering drainage facilities the Act may be enforced.

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Map no. 10.2: Urban Area with Propose Landuse Pattern of Jhikargachha Paurashava

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5. For the conservation of archeological monuments or structures or historical development the Ancient Monuments Preservation Act, 1904 (Act No. VII of 1904) and National Building Code 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 for brick burning and establishment of brick field, Brick Burning Control Ordinance, 1989 (Ordinance No. VIII of 1989) is the appropriate regulation. The Paurashava authority may enforce this Ordinance with the securing government authorization.

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

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

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

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utilized under the guidance of Culturable Waste Land (Utilization) Ordinance, 1959 (Ordinance No. E.P. XIII of 1959).

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

10.4.2 Implementation, Monitoring and Evaluation of the Land Use Plan

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

Objective of a Multi-Sectoral Investment Programs (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: Land Use 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

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legal and operational framework, coupled with suitable incentives, to facilitate land consolidation, plot boundary readjustment, efficient lay out of plots and provision of local infrastructure by the private sector. The benefits of this approach would be:

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

Plan Monitoring

The Landuse Plan would simply be tools for guiding and encouraging the growth and development of the 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 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.

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- 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.

10.5 Land Use Permit

One of the major purposes of land use zoning is to restrict an area for a particular use meant for the zone. This is intended to maintain a disciplined land use distribution and development. But there are many uses other than the use meant for the zone that are considered for permit in the zone. Sometimes such applications are required to be accommodated to support or assist the area, sometimes conditions are imposed in giving land use permit, sometimes strict restrictions are maintained by refusal of applications. A detailed list of permitted and conditionally permitted uses have been provided in **Annexure B** according to land use categories. The list has been developed with ideas borrowed from the recommendations made by the consultants under the recently completed DAP Project of RAJUK. It is required that all permit procedures mentioned in **Annexure B** are officially adopted through incorporation in the Building Construction Rules under Section 18 of the East Bengal Building Construction Act 1952.

Chapter 11

Transportation and Traffic Management Plan

11.1 Introduction

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

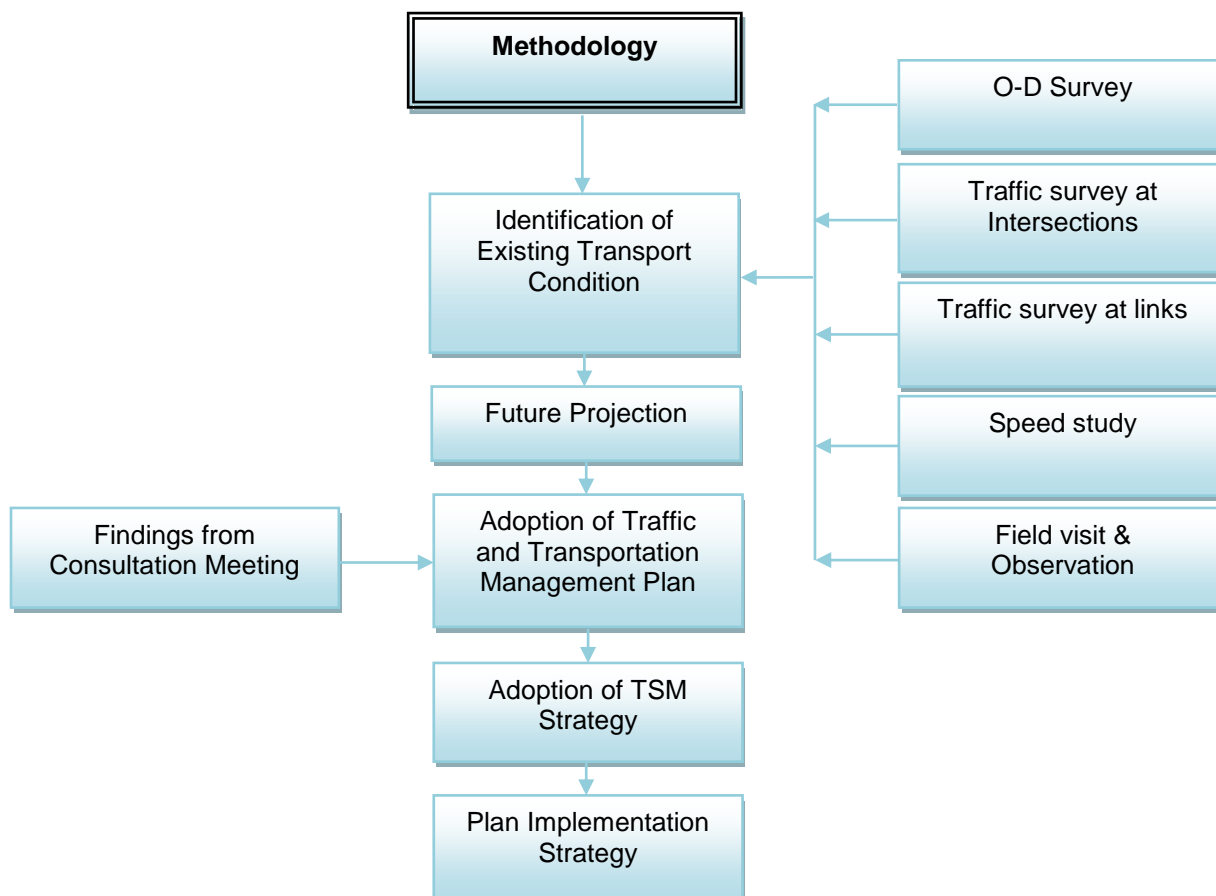
The current chapter of the report is about Transportation and Traffic Management Plan covering its development plan proposals and traffic management up to the year 2031. Transportation and Traffic Management Plan is a part of the second stage of the current plan package. This planning component is based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

11.2 Approach and Methodology

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

Standard methodology was followed for traffic study in the project area as per the Terms of Reference. A nine hour traffic counting was conducted to assess the traffic volume at the most important traffic point, the zero point of the town near 'Baro Pool'. An origin-destination (O-D) survey was also conducted at the same point where origin and destination of the traffic passing through this point was recorded. Speed and Delay survey was done at 3 points on major local roads.

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

Part B: Urban Area Plan**Figure- 11.1: Flow Chart of the Methodology**

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

11.3 Existing Conditions of Transportation Facilities

11.3.1 Roadway Characteristics and Functional Classification

The road hierarchy of Jhikargachha Paurashava is limited to Feeder Road Type-A (District Roads), Feeder Road Type-B and Rural Roads (Category R1, R2 & R3) only. There is one National Highways passes through middle of this Paurashava. According to the Rural Infrastructure Strategy Study '96 of World Bank & Planning Commission the Road hierarchy of Bangladesh is categorized as illustrated in Table 11.1:

Part B: Urban Area Plan**Table 11.1: Road hierarchy in Bangladesh**

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

Source: Rural Infrastructure Strategy Study, 1996

There are as many as three types of roads are existed in Jhikargachha Paurashava which is Pucca, Semi-Pucca and Kutcha. The Pucca roads are usually the paved bituminous roads, Semi-Pucca roads are mostly the Herring Bone Bond (HBB) type, and the Kutcha roads are usually earthen roads. A list of some major roads of functional importance in the regional transport network has been given in Table-11.2 below:

Table 11.2: Inventory of Some Major Roads at Jhikargachha Paurashava

Sl. No.	Name of Major Roads	Road Hierarchy	Width (m)	Total Length (km)	Road Type
01.	Jessore Benapol Highway	National Highway	6.15	4.25	Pucca
02.	Kirtipur Road	Rural Road	2.76	1.68	Pucca
03.	Hospital Road	Feeder Road Type-B	3.60	0.42	Pucca
04.	Chougachha Road	Feeder Road Type-B	3.05	1.25	Pucca
05.	Upazila Road	Feeder Road Type-B	4.28	0.67	Pucca
06.	Sreerampur Road	Rural Road	3.66	1.53	Pucca

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

11.3.2 Traffic Pattern

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

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

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It was revealed from traffic volume survey that non-motorized traffic comprises 81.38% of the total volume and the remaining 18.62% is composed of motorized traffic. Thus Non-motorized traffic (NMT) should be considered as a major issue in formulating traffic and transportation management plan.

11.3.3 Intensity of Traffic Volume

There are two major intersections prevail in Jhikargachha Paurashava namely Upazila More and Thana More. In those important intersections, traffic surveys had been conducted. Considering office time from 9:00 AM to 5:00 PM, intersection traffic flow had been presented during morning peak hour 9:00-10:00 AM and evening peak hour 4:00-5:00 PM. The off-peak hour had been considered at 6:00-7:00 AM and 11:00-12:00 PM for lowest volume of traffic in the observed intersection.

Upazila More intersection: Peak hourly traffic volume in links are ranges from approx. 1189 to 1569 PCU during hat days and hourly traffic volume ranges from 1076 to 1420 PCU during the non-hat days through this direction. In contrast, the traffic volume in off-peak period is not high enough to consider as the peak hour data is low.

Thana More intersection: Peak hourly traffic volume in links are ranges from approx. 1130 to 1467 PCU during hat days and hourly traffic volume ranges from 804 to 1243 PCU during the non-hat days through this direction. In contrast, the traffic volume of data in off-peak period is not high enough to consider as the peak hour data is low.

The diagram of these two intersections is illustrated in Figure-11.2A and 11.2B.

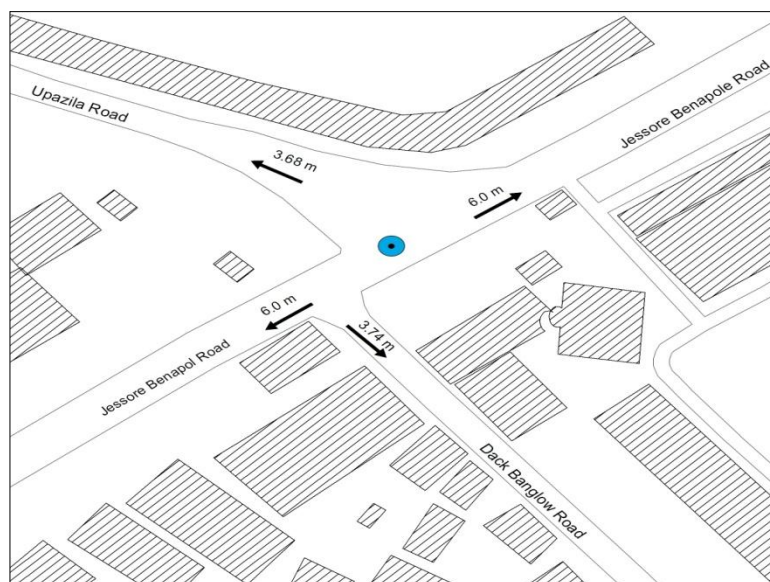


Figure 11.2A: Flow Diagram of Upazila More

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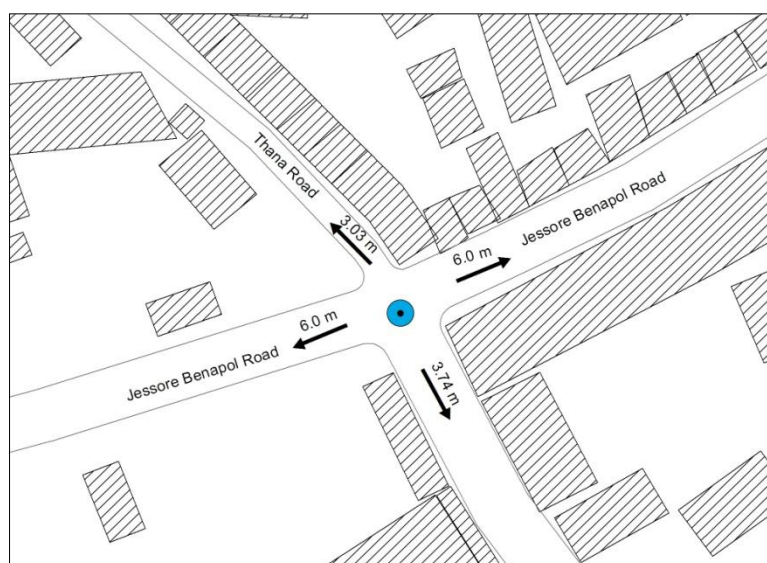


Figure 11.2B: Flow Diagram of Thana More

11.3.4 Level of Service: Degree of Traffic Congestion and Delay

Speed is one of the most important characteristics of traffic and its measurement is a frequent necessity in traffic engineering studies. Speed is the rate of movement of traffic or of specified components of traffic and is expressed in metric units in kilometers per hour (K.P.H.).

Like any other Upazila towns, Jhikargachha Paurashava is also dominated by non-motorized (Mostly Rickshaw) traffic (NMT). It is observed that, NMT imposed on the road nearly double than the motorized transport by both volume and PCU. So, the speed and delay of the transport sector has been studied considering Non Motorized Transport.

It is observed that, the running speed (average speed maintained by a vehicle over a given course while the vehicle is in motion) of peak period is almost 78% from that of off-peak period. The main cause for this low speed is the congestion in the Bazar intersection which is mainly for narrow road and improper design of cross section as well poor traffic management. The maximum and minimum speeds are 25 KPH and 6 KPH. It is significant to note the clause 'while the vehicle is in motion', because the running speed is obtained by dividing the length of the course by the time the vehicle is in motion, *i.e.* by the running time, which excludes that part of the journey time when the vehicle suffers delay.

The delays occurring due to stopping is conveniently recorded by separate stop-watch. Special watches which can accumulate the delay time as the observer operates buttons find convenient for this purpose. The delays have been measured at the intersection of Upazila more.

In addition to stoppage delays, the delays in Jhikargachha town is caused by the intervention of various factors such as congestion, inadequacy of carriageway width, mixed traffic conditions, parked vehicle and heavy pedestrian flow and such delays are called congestion delays or operational delays. These are rather difficult to measure precisely.

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It is observed that, peak period takes on average 30% excess time than off-peak period in Jhikargachha Paurashava due to the congestion, narrow road width and improper design of the intersection.

11.3.5 Facilities for Pedestrians

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

11.3.6 Analysis of Existing Deficiencies

As in any other small town in Bangladesh, Jhikargachha has also its own road and transportation deficiencies. These deficiencies have been identified from two different sources-first, by reconnaissance survey of the town, field observation and physical surveys, passenger and operator interviews and the second by means of household sample survey.

11.3.6.1 Roadway Capacity Deficiencies

Narrow Road Width

Narrow width of roads and poor maintenance has been marked by most respondents (of the household survey conducted) as major road problems in the town. Narrow width of roads is likely to become a major problem of traffic movement when the town grows and density of population increases in future with consequent increase road traffic. A very significant of the households (63.09%) of the town reported that the road widths in front of their houses are very narrow. This is alarming, as there will become a source of traffic problem when road traffic increases. When traffic on the street will rise it will create serious traffic congestion on the narrow streets. There is little chance that the authority will be able increase the road width in highly built up areas- especially in the crossing point of main bazaar area. Because this will involve high cost as compensation and also there will social-pressure on any attempt to demolition of structures.

About 50% of the households reported of having pucca roads in front of their houses, which is not an example of good works by the Jhikargachha Paurashava. When asked about the problem of roads, maximum respondents answered affirmative. Indicating to major road problems, they pointed to narrow width of roads, flooding of roads during monsoon, poor condition of roads due to lack of maintenance, traffic congestion at particular points of the town.

Part B: Urban Area Plan**Table-11.3: List of Narrow Roads**

Sl. No.	Road Name	Road Hierarchy	Avg. Width (m)	Length (km)	Type
1	Jikorgacha to Sagorpur Road	Rural Road Class 3	3.15	1.01	Katcha
2	Graveyard Road	Rural Road Class 2	3.23	1.89	Katcha
3	kitripur Road	Rural Road Class 3	3.29	1.31	Pucca
4	Laksmipur Road	Rural Road Class 1	3.17	0.53	Pucca
5	Shrerampur Road	Rural Road Class 2	3.50	0.53	Pucca
6	Krishna Nagar Math Para Road	Rural Road Class 1	3.08	0.61	Pucca
7	Chuugacha Road	Rural Road Class 1	3.30	1.25	Pucca
8	Jhikorgasa-Benapole	Rural Road Class 2	3.56	2.17	Pucca

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

Household survey shows, about 50% of the respondents responded that widening of the road is possible and they agreed to contribute land towards road widening. The authority should take this opportunity and draw up plans to widen the narrow roads. The execution of road widening can be done in phases, if there is lack of funding.

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 alignment along the edges of the tortuous plot boundaries. Another problem of community initiated roads is that they are not in a well Link Road network. Sometimes links to nearby roads are missing. This causes people travel comparatively longer distances to reach a nearby destination.

Traffic Conflict and Congestion

Traffic jam and conflict point is common and frequent in towns where there is mixture of transport vehicles and fast in the streets. Areas of jam occur at point where there is intensity of traffic is high. The consultant studied the traffic movement in all over the town and has identified two main points where traffic jam or conflict is high. These two points are Upazila Mor and Thana Mor. At these point slow moving vehicles like rickshaw and vans come with motor vehicles and creating traffic congestion.

The identified reasons for traffic conflict are,

- too large number of non-motorized traffic,
- disobedience of rules and regulations by operator,
- improper intersection design,
- on street parking of vehicles,
- vehicle operators waiting on the streets looking for passengers, and
- absence of traffic signal, etc.

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11.3.6.2 Operational Safety, Signal and other Deficiencies

Like any other Upazila town, Jhikargachha Paurashava lacks traffic management system. There is no traffic point and traffic island including road dividers, no signal posts. There is no traffic police. So the traffic operation and road safety are yet to become important traffic issues.

11.3.7 Condition of Rail/Water/Air Transport

Railway Network

4.27 km Rail way network exists in Jhikargachha Paurashava.

Existing Waterway Network

There are two khals and a river named Kapatakkha in Jhikargachha Paurashava. The river is used as regular water way transportation.

Air Transport

There is no air transport facility in Jhikargachha.

11.4 Future Projections

11.4.1 Travel Demand Forecasting for Next 20 Years

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

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

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

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

Three factors affect the demand for urban travel:

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

Land use characteristics are a primary determinant of travel demand. The amount of traffic generated by a parcel of land depends on how the land is used, for example, shopping centers, residential complexes, and office buildings produce different traffic generation patterns. Socioeconomic characteristics of the people also influence the demand for transportation. Lifestyles and values affect how people use their resources for transportation, for example, a

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residential area consisting of high-income workers will generate more trips by automobile per person than a residential area populated primarily by low-income workers.

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

Furthermore, the traffic survey for the UTIDP was conducted to get the overall picture of traffic pattern in the study area and this survey is not detail enough to allow extrapolation of traffic. That is why; the consultants have some limitations to adopt any traffic model to forecast future traffic demand. The complexities of traffic in the study area, as per common observation are assumed to be insignificant. However, prior to maintaining proper planning standard, the Paurashava is yet capable of regulating the traffic. Nevertheless, the recommended planning standards of road are the followings (Table- 11.4):

Table-11.4: Recommended Planning Standard

Types of Road	Recommended width
Paurashava Primary Roads	30.48-45.73 meter (100'-150')
Paurashava Secondary Roads	18.29-30.48 meter (60'-100')
Local Roads	6.10-12.20 meter (20'-40')

Source: UTIDP Planning Standard, LGED

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

11.4.2 Transportation Network Considered

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

11.4.3 Future Traffic Volume and Level of Service

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

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

The two intersections are Thana moor and College moor Intersections are the most important intersections of the Jhikargachha Paurashava. The intensity of traffic movement observed in Thana Mor and Bus Stand intersection is high and traffic conflict is prevalent at these points.

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

- The individual characteristics of the community, its goals, objectives and needs;
- The ability to provide the facilities that are determined necessary to maintain the policy level of service for current and future traffic volumes;
- The ability to fund the facilities that are determined necessary to maintain the policy level of service for current and future traffic volumes.

11.5 Transportation Development plan

11.5.1 Plan for Road Network Development

Road Network of the town has been developed without considering external and internal linkage of the Paurashava. As a result lack of an integrated road network has been observed among the localities. Since road transport is the only mode of transport prevailing in the Paurashava, road network development is the key component of the Transportation Development Plan. The Road Network should be developed through the provision of new roads and connecting roads along with improvement of existing road network.

11.5.1.1 Road Network Plan

The Banapole Jessore Highway comes from north-east direction, Upazila Road comes from north; Chougacha Road comes from north-south. All the roads meet together at Thana more and Upazila More of the town. Apart from major roads, large number of local roads having width varying from 10 ft. to 20 ft. width, give access to individual houses and establishments and connect them to major roads. Jessore Banapole road is the heart of the road plan. So in the plan this road is proposed to be widened up to 120 ft. in future. To avoid through traffic within the Paurashava a bypass road is required. So Sreerampur road was identified to be used as bypass road of the town and it was proposed to widen this road up to 150 ft. Details of proposed major new roads and widening of roads is presented in following table while a detailed road inventory (proposed) has been enclosed in **ANNEXURE- D. Map-11.1** shows the proposed and existing road network of Jhikargachha Paurashava.

Table 11.5: Major Primary and Secondary Road Proposal for Jhikargachha Paurashava

Road ID	Road Name	Road Type	Existing width (ft.)	Proposed Type	Proposed ROW (ft.)	Length (m)	Phasing
PR-1	Chuugacha Road	Primary	9.18	Widening	80.00	1245.53	01
PR-2	Jhikorgasa-Benapole	Primary	9.16	Widening	150.00	2168.59	01
PR-3	Benapole Jessore	Primary	20.00	widening	120.00	5728.60	01

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Road ID	Road Name	Road Type	Existing width (ft.)	Proposed Type	Proposed ROW (ft.)	Length (m)	Phasing
	Hihgway						
PR-5	Jikorgachha to Monirumpur Road	Primary	12.06	Widening	80.00	1132.73	01
PR-6		Primary	0.00	New	120.00	1121.80	01
PR-8	Sreerampur Road	Primary	21.84	Widening	150.00	3761.27	01
SR-1	Jikorgacha to Sagorpur Road	Secondary	8.99	Widening	60.00	1005.50	01
SR-2		Secondary	0.00	New	60.00	1292.80	01
SR-5		Secondary	12.05	Widening	60.00	2066.29	01
SR-6		Secondary	12.01	Widening	60.00	2118.39	01
SR-8	Graveyard Road	Secondary	9.09	Widening	60.00	1893.92	01
SR-9	kitripur Road	Secondary	8.65	Widening	60.00	1307.17	01
SR-14		Secondary	9.16	Widening	60.00	1041.52	01
SR-17		Secondary	0.00	New	60.00	1359.51	01
SR-23		Secondary	10.00	Widening	60.00	1947.85	01
SR-27		Secondary	10.00	Widening	60.00	2130.34	01

11.5.1.2 Proposal for improvement of the existing road networks

Traffic management measures may be adopted to increase traffic capacity and safety. The improvement could be done by removing the deficiencies in the existing core road network by widening and/or strengthening of selected stretches/ corridors in a phased manner and improvement of road geometrics and safety provisions. The proposals for widening of existing roads are listed in tabular form (Table: 11.6) below:

Table 11.6: Tertiary and Access Road Improvement Proposal for Jhikargachha Paurashava

Road ID	Type of Improvement	Road Type	Proposed ROW (ft)	Length (Km)
AR-101	Widening	Access Road	20	0.303
AR-111	Widening	Access Road	20	0.377
AR-112	Widening	Access Road	20	0.226
AR-118	Widening	Access Road	20	0.202
AR-123	Widening	Access Road	20	0.416
AR-190	Widening	Access Road	20	0.634
AR-202	Widening	Access Road	20	0.343
AR-203	Widening	Access Road	20	0.327
AR-218	Widening	Access Road	20	0.423
AR-61	Widening	Access Road	20	0.365

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Road ID	Type of Improvement	Road Type	Proposed ROW (ft)	Length (Km)
AR-67	Widening	Access Road	20	0.903
AR-9	Widening	Access Road	20	0.062
TR-1	Widening	Tertiary	40	0.351
TR-101	Widening	Tertiary	40	0.596
TR-16	Widening	Tertiary	40	0.452
TR-18	Widening	Tertiary	40	0.334
TR-19	Widening	Tertiary	40	0.313
TR-21	Widening	Tertiary	40	0.349
TR-36	Widening	Tertiary	40	0.348
TR-54	Widening	Tertiary	40	0.773
TR-55	Widening	Tertiary	40	0.551
TR-57	Widening	Tertiary	40	0.404
TR-87	Widening	Tertiary	40	0.648
TR-92	Widening	Tertiary	40	0.987

11.5.1.3 List of newly Proposed Tertiary and Access roads

The Urban Area Plan provides brief description of any proposed transport improvements. The transport content of this plan has been developed around the framework of the Structure Plan. The specific transport proposals set out in the Urban Area Plan for public consideration include new road schemes and improvements, traffic management measures, the co-ordination of public transport services, the control of car and lorry parking and the improvement of cyclist and pedestrian safety. The proposals put forward for discussion to the mass people of the Paurashava. The Paurashava authority also advises about road development should not be duplicated in the public examination of Urban Area Plan and Ward Action Plans. Local Authority roads, which are not strategic, are not included in the Ward Action Plan and both the need for the road and the line of the route are matters for the Urban Area Plan to consider. A list proposed of new roads have been made after studying the existing road network, travel demand pattern, potential for future urban growth and conducting public consultation meeting with Paurashava officials, councillors, local people and other stakeholders which is presented in Table-11.7.

Table-11.7: List of newly Proposed Tertiary and Access Roads in the Project Area

Road ID	Type of Improvement	Road Type	Proposed ROW (ft)	Length (Km)
AR-114	New	Access Road	20	0.351
AR-117	New	Access Road	20	0.364
AR-129	New	Access Road	20	0.248
AR-13	New	Access Road	20	0.416
AR-132	New	Access Road	20	0.256
AR-136	New	Access Road	20	0.238

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Road ID	Type of Improvement	Road Type	Proposed ROW (ft)	Length (Km)
AR-137	New	Access Road	20	0.299
AR-138	New	Access Road	20	0.349
AR-141	New	Access Road	20	0.767
AR-144	New	Access Road	20	0.302
AR-147	New	Access Road	20	0.426
AR-16	New	Access Road	20	0.306
AR-168	New	Access Road	20	1.084
AR-169	New	Access Road	20	0.289
AR-180	New	Access Road	20	0.451
AR-182	New	Access Road	20	0.584
AR-183	New	Access Road	20	0.265
AR-20	New	Access Road	20	0.363
AR-215	New	Access Road	20	0.328
AR-243	New	Access Road	20	0.664
AR-249	New	Access Road	20	0.325
AR-253	New	Access Road	20	0.301
AR-254	New	Access Road	20	0.302
AR-264	New	Access Road	20	0.354
AR-68	New	Access Road	20	0.575
AR-70	New	Access Road	20	0.314
AR-80	New	Access Road	20	0.764
TR-104	New	Tertiary	40	0.627
TR-105	New	Tertiary	40	0.428
TR-11	New	Tertiary	40	0.476
TR-12	New	Tertiary	40	0.362
TR-14	New	Tertiary	40	0.309
TR-2	New	Tertiary	40	0.446
TR-47	New	Tertiary	40	0.435
TR-48	New	Tertiary	40	0.315
TR-51	New	Tertiary	40	0.327
TR-52	New	Tertiary	40	0.592
TR-59	New	Tertiary	40	1.102
TR-73	New	Tertiary	40	1.157

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Road ID	Type of Improvement	Road Type	Proposed ROW (ft)	Length (Km)
TR-74	New	Tertiary	40	0.324
TR-75	New	Tertiary	40	0.324
TR-76	New	Tertiary	40	0.327
TR-79	New	Tertiary	40	0.384
TR-81	New	Tertiary	40	0.505
TR-82	New	Tertiary	40	0.415
TR-83	New	Tertiary	40	0.418
TR-85	New	Tertiary	40	1.391
TR-86	New	Tertiary	40	1.004
TR-91	New	Tertiary	40	0.759

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Map no. 11.1: Propose and Existing Circulation Network of Jhikargachha Paurashava

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Paurashava Primary Road

One bypass road and two new roads are proposed as Primary roads. Total length of primary road is 16.42 km with 80 - 150 ft RoW. Total 15.10 km primary road need to be widened up to RoW 150 feet and the rest 1.32 km primary road will be newly constructed up to RoW 80-120 feet within the Paurashava. Figure 11.1 shows the layout design of primary road with 80ft RoW and Figure 11.2 shows the layout design of primary road with 60ft RoW.

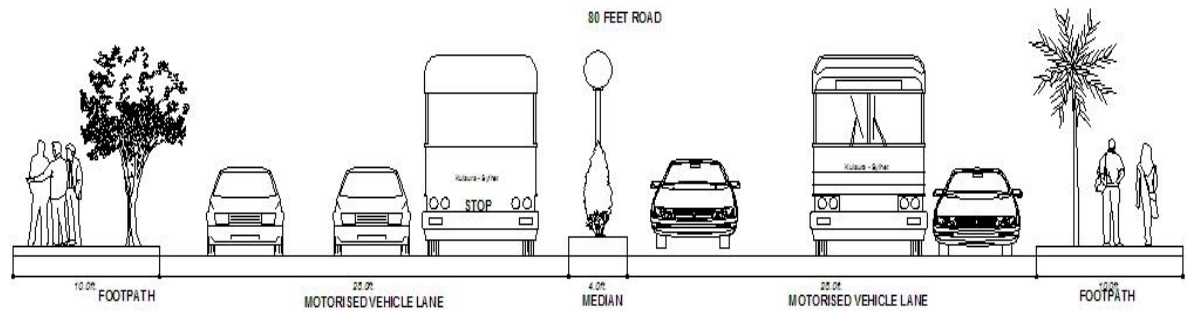


Figure 11.3: Primary Road with 80 ft RoW

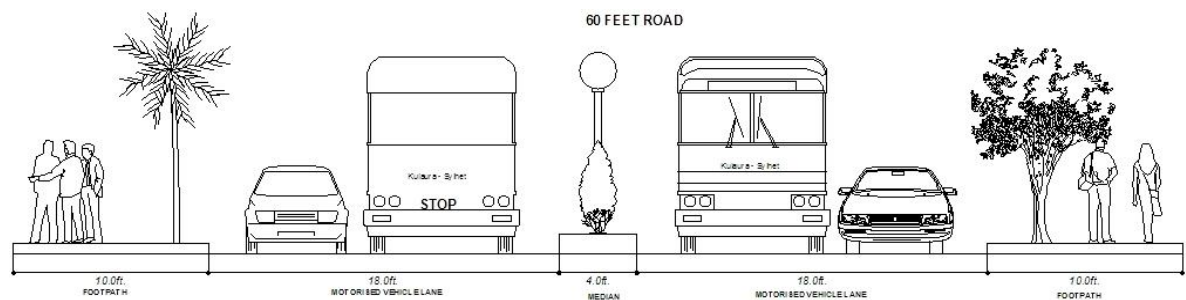


Figure 11.4: Primary Road with 60 ft RoW

Paurashava Secondary Road

Total secondary road is 23.97 km with 60 ft RoW in whole project area. 3.36 km secondary road of RoW 60 feet will be newly constructed during the project period and rest 20.61 km secondary road will be linked and widened. Figure 11.3 shows the layout design of primary road with 40 ft RoW.

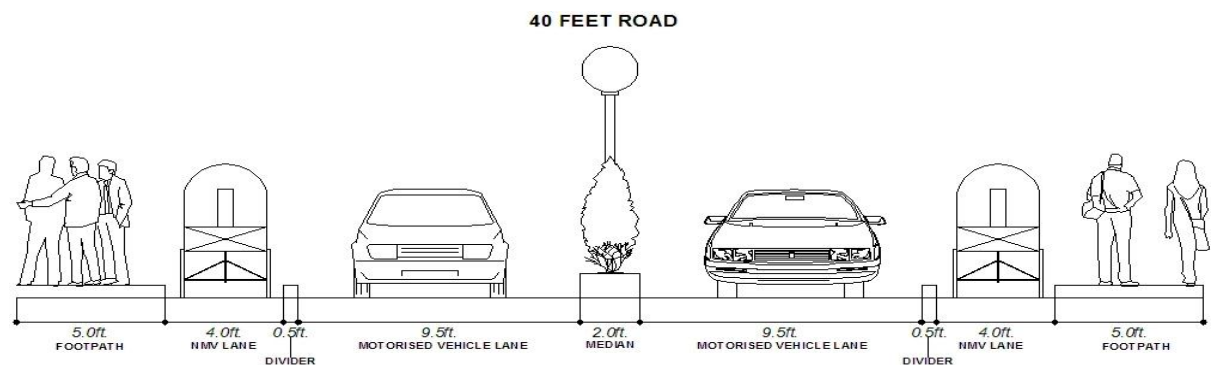


Figure 11.5: Secondary Road with 40 ft RoW.

Part B: Urban Area Plan**Paurashava Tertiary Road**

Total tertiary road is 34.78 km within the project area with 40 ft RoW. Due to the natural barriers and important establishments the width is not possible widening more than 40 ft RoW. A total of 24.48 km of existing tertiary road will be developed as widening within the Paurashava. Figure 11.4 shows the layout design of tertiary road with 20 ft RoW

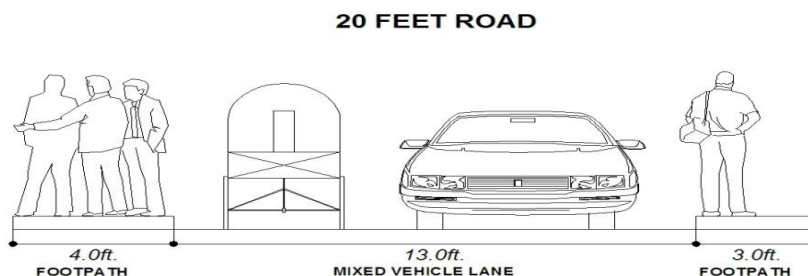


Figure 11.6: Access/Local Road with 20 ft RoW.

11.5.1.4 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.

Within the established area, 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 flow 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.

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

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

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

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

- links between the 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 reserve being 24 meters either side of the road centre line, although this may vary especially on existing roads due to localized circumstances.

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

No **non-road related development** will be permitted within the road reserve. For new roads which will not be constructed in the foreseeable future, agricultural use of the reserve will be permitted until such times as the road is constructed. No permanent or temporary structure will be permitted. In general, **no direct access** will be permitted onto the main carriageways (of secondary roads) with access gained only at controlled junctions. Occasionally, due to existing situations, access from a side road may be entertained. The number of junctions should be minimized with desired spacing being at 200 meter intervals. Again, this may vary according to necessity but where deviation from this desired spacing is necessary, the deviation should be small. Junctions will be in the form of roundabouts or traffic lights.

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

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Functions of the **tertiary road** are:

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

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

No development will be permitted within the 18 meter reserve.

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

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

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

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

11.5.1.5 Proposals for new roads

To improve existing transportation system a total of 57.99 km new roads of different width has been proposed within the entire project area in the transport development plan. The highest 28.82 km (49.71%) Access new road is proposed with 20 ft right of way (RoW). Then 24.48 km (42.21%) Tertiary new road is proposed with 40 ft right of way (RoW) and 3.36 km (5.80%) new road is proposed with 60 ft RoW, which will function as secondary road. Finally, 1.32 km. (2.28%) new road is proposed as primary road with 80-120 ft width. Table 11.3 shows the summary of new road proposal.

Table 11.8: Summary of new road proposal in Jhikargachha Paurashava

Road Type	RoW (in ft)	Length (in meter)	Length (in km)	Percentage
Access Road	20	28822.87	28.82	49.71
Tertiary Road	40	24484.71	24.48	42.21
Secondary Road	60	3364.89	3.36	5.80
Primary Road	80	203.63	0.2	0.34
	120	1121.80	1.12	1.93
Total		57997.90	57.99	100.00

11.5.2 Plan for Transportation Facilities

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

Part B: Urban Area Plan**11.5.2.1 Proposal for Transportation Facilities**

Following are the suggested planning standards for transport facilities plan. The standards are meant for use by UTIDP, LGED and other planning and development agencies. The standards have been adopted by the consultants to draw up the transportation development plan.

Table 11.9: Estimation of Land Requirement for Transportation Facilities and proposals

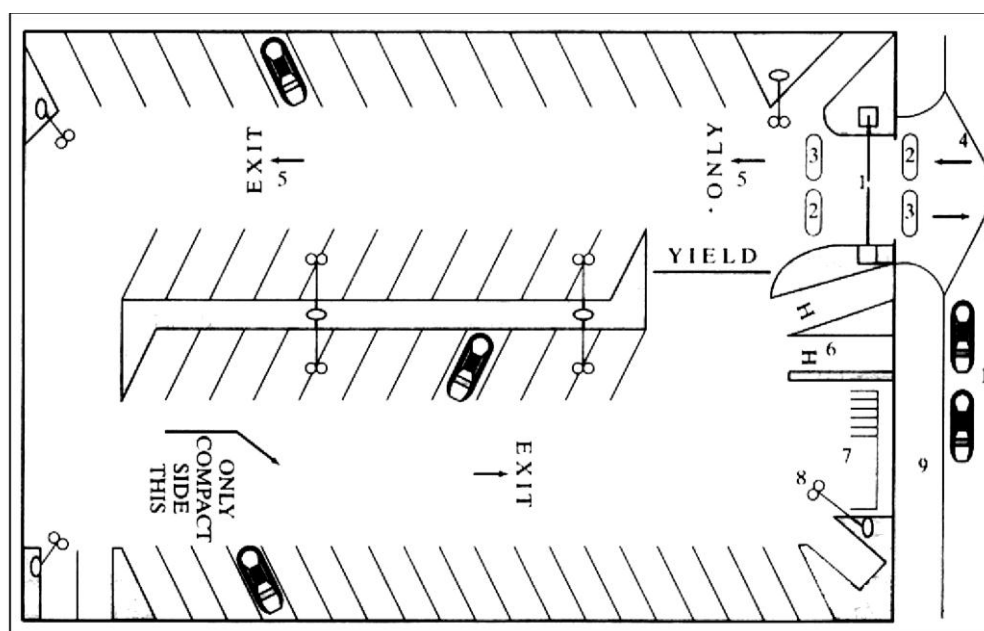
Types of Land Uses	Recommended Standard Provision	Estimated area (acre)	Proposed Area	Location
	(unit)	2031	(Acre)	
Bus terminal	1.0 acre /20,000 population	2.27	5.36	Ward-5
Truck terminal	0.50 acre /20,000 population	1.14	6.36	Ward-5
Railway station	4.00 acre / per Station	4.00	3.23	Ward-6
Bus Stand/Baby taxi/tempo stand	0.25 acre /one baby taxi/tempo stand	-	2.90	Ward-1, 5 & 9

11.5.2.2 Parking and Terminal Facilities**Bus Terminal**

There is no bus terminal in Jhikargachha hence a new bus terminal has been proposed in ward no. 5. The area coverage of the terminal is about 5.36 acres. This terminal is expected to be able to cater to the need of the town for next 20 years.

Truck Terminal

As a small town, the economic activity is very low in Jhikargachha Paurashava. There are only a handful of small scale processing factories including a few saw mills and limited trading activities. So, movement of trucks is extremely negligible here. So, no truck terminal is proposed for the town. In future, if industrial estate developed, a truck terminal can be provided there. Two new truck terminals are proposed in ward no. 5. The area coverage of the terminal is about 6.36 acres.

**Figure 11.7: Typical Layout of a Bus & Truck Terminal**

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Tempo Stand/Auto-ricks stand

Rickshaw, van and Autorickshaw are the major vehicles in Jhikargachha Paurashava for passenger carrying. According to the Paurashava database, in Jhikargachha there are 400 Rickshaws. Three new tempo stands have been proposed in ward no. 01, 05 and 09. The area coverage of the stands is about 1.01 acres.

Bus Stand

A bus stand is a designated place where buses stop for passengers to board on or disembark from a bus. A bus stand should be a place for safe passengers as well as free the traffic movement on the road. Usually a bus bay is designed off the main road. The construction of bus stand tends to reflect the level of usage. Stops at busy locations will have bus bay designated along with intersection design. Three bus stands have been suggested in the plan. These stands will be designed in ward no. 1, 5 & 9 (**Please see Map- 11.2**).

Parking Facilities

There is hardly any locally owned car in the town but it is likely that there will be a good number of private cars in the near future. So, parking is a necessary requirement for the town at the moment. Therefore, four parking space has been suggested in ward no 1.

Policies on Managing Parking Demand

- 1) Non-restrictive parking shall be adopted in residential areas where the demand for parking is much less than the available of parking spaces.
- 2) Restrictive parking shall be adopted in areas where the demand exceeds the available parking spaces. These shall be enforced through pricing and regulatory mechanisms.
- 3) Two types of parking charges shall be levied at public parking places in the restrictive parking areas. Normal charges aimed to recover of operation and maintenance expenses, shall be levied in locations where the parking provision does not adversely affect the movement of traffic. Deterrent parking charges shall be more than the normal charges and shall be adopted in areas where parking demand is in excess of supply or in places where parking is observed to adversely affect the movement of traffic.
- 4) Regulations shall include parking restrictions to specific or all types of vehicles either by time of day or by duration or for specific purpose of travel or for vehicles carrying less than specified number of passengers per vehicle or by location.

Policies on Supply of Parking Spaces

- 1) Parking standards shall be reviewed once every five years. Necessary modifications shall be incorporated in the building rules.
- 2) There shall be regular monitoring of parking provisions in all buildings. Buildings found to be deficient in parking provisions vis-à-vis current building rules shall be required to pay a parking facility fees. This shall be in proportion to the extent of violation with respect to the required provision. The revenue from this source shall be used for augmenting parking facilities (on-street / off-street) in the area.
- 3) Private sector shall be encouraged to build and operate parking facilities to augment parking capacity in deficient zones. A standard and transparent procedure shall be adopted for selection of private enterprises.
- 4) Effort shall be made to develop park and ride facilities at all public transport interchanges in the city.

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- 5) While imposing restriction to the movement of specific types of vehicles effort shall be made to provide adequate vehicle parking facilities at the terminal or interface points.
- 6) Effort shall be made to identify locations for truck terminals. Private sector participation shall be encouraged in the development and operation of these facilities.
- 7) Existing statutes shall be amended to make it mandatory for owners and operators of stage and contract carriers to park their vehicles in garages when the vehicles are not in operation.
- 8) Adequate parking spaces shall be reserved for taxis in all public parking places.

Policies on Operation and Maintenance of Parking Facilities

- 1) Concerned local authorities shall be responsible for the efficient operation and maintenance of public parking facilities.
- 2) Private sector should be encouraged to operate and maintain the public parking facilities on behalf of the local authorities.
- 3) A clear and transparent procedure shall be adopted for selection of contractors.
- 4) Paurashava shall develop a standard training program and ensure that all staff of the contractors involved in the operation and maintenance of parking facilities undergoes this training. This would enable standardized operation and maintenance of parking facilities.

Policies on Parking Regulation

- 1) In restrictive parking areas, on-street parking shall be prohibited on all roads within the area except at places where it is specifically permitted by authorized road signs and markings.
- 2) The Chief of Police in Paurashava shall be the authorized person to notify the parking regulations, parking fees to be charged at each location and penalties for violation of parking regulations. This will be done through press releases and gazette publications.
- 3) The Chief of Police shall be advised by a Committee on matters relating to parking regulations, parking charges and penalties for violation.

Policies on Enforcement of Regulations

- 1) The Local Police shall be responsible for enforcing parking regulations as notified by the Police Chief.
- 2) They shall assign adequate number of police personnel of appropriate rank for surveillance and enforcement of parking regulations in each zone. There shall have a tow truck to facilitate eviction of offending vehicles.
- 3) Tow trucks shall be requisitioned from private enterprises to facilitate enforcement of parking regulations. The operating expenses shall be recovered through penal fees collected from violators.

Policies on Institutional Setup and Capacity Building

- 1) Preparation of parking plans, provision of parking facilities and its management shall be the responsibility of the Paurashava. They shall also monitor the operation and maintenance of facilities and ensure uniform standards at all locations.
- 2) Paurashava shall regularly monitor the parking provisions in buildings vis-à-vis prevailing building rules and collect necessary fees for non-compliance.
- 3) Local Police shall be responsible for enforcement of parking regulations and shall ensure regular surveillance for parking offenses.
- 4) All fees namely, Operation and Maintenance Contract fees, parking fees, parking

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development fees etc. collected by the Paurashava and Local Police shall be credited to a parking fund. An appropriate authority in the Paurashava shall operate this fund exclusively for provision of parking facilities and for procurement of equipment and services for all concerned agencies.

Policies on Supportive Legislations

- 1) The Chief of Local Police shall be given the authority to regulate and enforce parking within the Paurashava area.
- 2) Paurashava shall be given the authority to collect parking fees at public parking facilities.
- 3) Paurashava shall also have the authority to inspect premises for parking provision violations. They shall be given the authority to fix, levy and collect development fees from building owners who do not comply with parking provisions as in the prevailing building rules.
- 4) Paurashava shall be given the authority to create a Parking Fund. All fees collected by Paurashava, and Local Police in connection with parking operation and maintenance, violation of building codes and enforcement shall be credited into this.
- 5) Necessary legislation shall be made to direct the Paurashava and Local Police to deposit the collected fines and fees into the parking fund.

Flexibility

This parking policy may need to be reviewed and modified to meet the changing demands, which may be the result of changes in related policies or other economic factors. Whenever this is done, the planning, implementing, regulating and enforcing agencies should be advised to proactively respond by making changes if necessary, to the parking plans and regulations in force.

Design consideration:

Off-Street Parking & Loading: Intent

Off-street parking and loading requirements are intended to minimize street congestion and traffic hazards and to provide safe and convenient access to residences, businesses, public services and places of public assembly.

Off-Street Parking Requirements

These shall be provided in such numbers, at such location and with such improvements as required by the provisions of Bangladesh National Building Code (BNBC) as shown below.

General Parking Requirements

Occupancy Class

Residential

Educational

Institutional/Health Care

Business & Mercantile

Industrial

Storage

The diagram below illustrates the parking angle and minimum aisle width.

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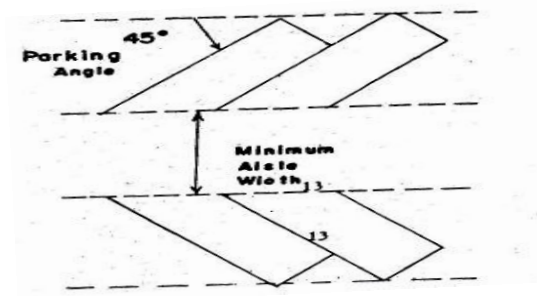


Figure 11.8: Parking Angle and Minimum Aisle Width

Off-Street Loading Requirements

Off street loading requirements shall apply to all zoning lots exceeding 500 square meters (5,350 square feet) in area for the class or kind of uses indicated below.

- | | |
|-----------------------------|---|
| ➤ Residential | 1 space if 20 units or more |
| ➤ Institutional/Health Care | 1 space if 50 beds for every 300 m ² |
| ➤ Business & Mercantile | 1 space if more than 5,000 m ² |
| ➤ Industrial | 1 space for every 300 m ² |
| ➤ Storage | 1 space if more than 1,000 m ² |

Notes:

- (a) All references to square meters refer to floor area.
- (b) Standard sized automobile parking spaces shall be at least 4.8 meters (15.75 feet) in length and 2.3 meters (7.5 feet) in width.
- (c) Vehicle entry and exit aisles shall be provided to a street and no driveway leading into a parking area shall be less than 3.5 meters in width.
- (d) Minimum area for a loading space shall be 5.8 meters (19 feet) in length and 2.5 meters (8.2 feet) in width and with a vertical clearance of 3 meters (10 feet).
- (e) When computation of required parking spaces results in a fractional number, the number of required spaces shall be the next highest number.

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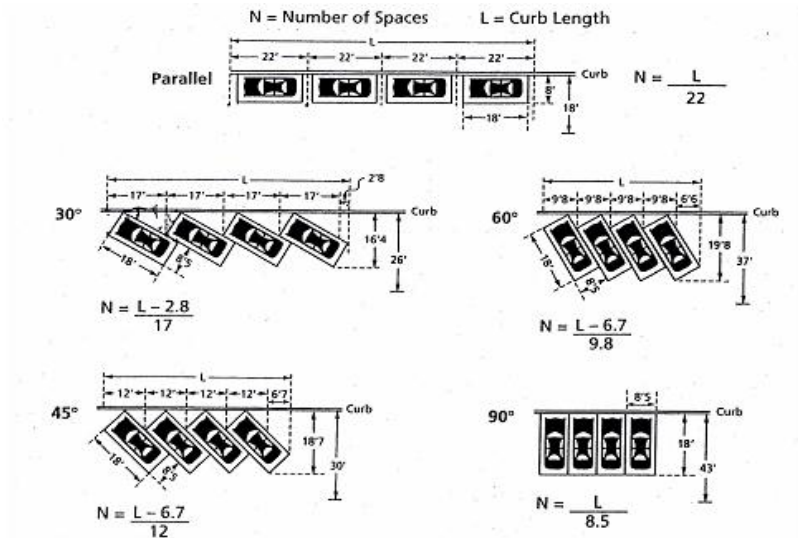


Figure 11.9: On-Street Space Used for Various Parking Positions

On-street Parking Angle	
0°	44°
45°	59°
60°	69°
70°	79°
80°	89°
	90°

Parking Requirement
- 1 space for every 300 m ²
- 1 space for every 200 m ²
- 1 space for every 300 m ²
- 1 space for every 20 occupants or 100 m ²
- 1 space for every 200 m ²
- 1 space for every 300 m ²
- 1 space for every 300 m ² *
- 1 space for every 300 m ² *
Aisle Width
- 3.6 metres (11.8 feet)
- 4.0 metres (13.1 feet)
- 5.5 metres (18.0 feet)
- 5.8 metres (19.0 feet)
- 6.0 metres (19.7 feet)
- 6.4 metres (21.0 feet)

**Map no. 11.2: Proposed and Existing and Propose Terminal and stands/stoppages
of Jhikargachha Paurashava**

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11.5.2.3 Development of Facilities for Pedestrians, Bicycles and Rickshaws

Footpath

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

Bicycles and Rickshaws

Separate lane for NMT vehicles will be provided in Transport network development plan which will be used by bicycle and rickshaw. Figure 11.3 shows the provision of separate lane for NMT vehicles.

11.5.2.4 Other Transportation Facilities

Improvement Roadway Intersection

Due to the poor designing of road way intersection, traffic congestion and traffic conflict occur in the Paurashava. To avoid this, appropriate design will be provided for the major intersection within the Paurashava in the detailed area plan.

Traffic Management

Traffic Management is to ensure maximum use of existing road space, through traffic operations enforcement, materials and equipment to achieve safe and efficient movement of people and goods. An example of the absence of good traffic management is the chaotic disorder that exists in many areas of the Paurashava today. A major source of traffic problem is poor traffic management.

In all the urban centers of Bangladesh traffic management is very poor. Particularly, adherence to traffic rule is highly slack that results most traffic problems. Indiscriminate parking ignoring the rules of directions, indiscriminate boarding and disembarking bus passengers, wrong side movement by non-motorized vehicles, fake driving license are all disobedience to traffic rules. Following measures are suggested to improve traffic management.

Signals and Road Marking

Road markings must be put on major roads and signals must be installed at intersections for good traffic management. Traffic police have to be posted at critical intersections.

Road Use Awareness Building

People must be made aware of road use including traffic rules. Drivers of all kinds of vehicles should imparted training on driving and road use. Publicity may be made for pedestrians on road use. Boys scouts and local NGOs can be engaged for this purpose.

Enforcement of Traffic Rules and Regulations

Traffic rules and regulations should be strictly enforced for all. Provision instant fine for violations may be introduced.

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11.6 Transportation System Management Strategy (TSM)

This section describes transportation system management (TSM) in respect of facilities and operations, traffic flow and safety, and traffic management in Jhikargachha Paurashava.

11.6.1 Strategies for Facility Operations

Since road is limited and it is foreseeable that new road construction will be very difficult due to unavailability of land and funding, traffic management strategies are required in order to ensure appropriate mobility. The following strategies are recommended for an overall traffic management improvement program:

Traffic Engineering

Ensure effective use and management of existing physical infrastructure. These enhancements typically include better road markings, signs, traffic signals, channelization at intersections, turning restrictions and separation barriers, space for bus stops, and parking/waiting areas for public transport vehicles (buses, rickshaws, auto-rickshaws, taxis, etc.). Each of the intersection approaches is required to have proper pedestrian crossing stripping i.e. Zebra crossing.

Parking

Parking should be prohibited on arterials highways unless it is possible to designate spaces such that they do not interfere with the free flow of traffic. At bus stops, there will be a need to provide properly design spaces for the use of feeder services provided by either rickshaws or CNGs.

Roadside Interference

Measures that move in a positive and definitive manner to reclaim the full potential capacity of the existing road by relocating or removing inappropriate and illegal non-transport related activities from the public right-of-way. In some cases this may involve the need to help relocate or establish alternative sites for such activities.

The right-of-way should be clearly defined and all obstructions removed within these confines. This will entail a gradual clearance of illegal trading areas, surplus building materials left over from construction and items such as refuse containers deposited on the road itself.

11.6.2 Strategies for Traffic Flow and Safety

Improved safety requires a multi-dimensional comprehensive approach involving issues related to road conditions, regulations, enforcement, driver training, vehicles, public education, awareness, incident response and information, all of which should be applied in a systematic manner over time and with adequate funding.

Road Safety Initiatives

Effective road safety action requires the involvement of many different disciplines and the cooperation of a wide range of government, private and civil entities.

Traffic Law Enforcement

Traffic law enforcement is needed to encourage safer road use and orderly traffic flow. Enforcement of various regulations, such as speed limits, use of seat belts, wearing of motorcycle safety helmets etc. have led to reductions of associated deaths and injuries in many countries. Effective enforcement of traffic regulations require training of the traffic police force in many traffic

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related areas, including incident investigation, highway patrolling, motorcycle riding and car driving and management skills. Traffic rules and regulations should be strictly enforced for all. Provision of instant fine for violations may be introduced.

Driver Training and Testing

The behavior of drivers, particularly of commercial vehicles, is generally considered to be chaotic and does not reflect consideration for others. Commercial vehicles are involved in a majority of incidents. Effective driver training and testing is important for achieving a long-term reduction in the statistics. To ensure that road user behavior becomes safer, improvements in the training and testing of all drivers is required. A “motivational” training program for all drivers, organized with the involvement and support of the vehicle owners and professional associations is one example of the type of training that would be beneficial.

Education and Publicity

To develop safe road user behavior, children need to be taught skills (i.e. how to cross a street safely, how to use traffic signals properly, how to watch for and anticipate driver behavior, etc.) rather than focusing simply on rules, regulations and knowledge of traffic signs. To be effective, road safety education requires a clear structure within a recognized curriculum with a planned, sustained and coherent program of learning, based on sound educational principles. Children learn a lot from observation of others.

Road safety publicity for the general public is equally important. Road safety education is a long-term intervention, aimed at developing positive attitudes in children such that they become safer road users in the future. Publicity is an indispensable part of any nation's road safety strategy. Boys scouts and local NGOs can be engaged for this purpose.

Vehicle Safety

Substandard, often overloaded, vehicles using roads that facilitate increasingly higher speeds, invariably will lead to increased incidents. Poor vehicle condition is widely accepted in Bangladesh to contribute to the number and severity of road collisions.

Despite inspection forms and manuals having been produced under a recent aid project, little priority has gone into their use. While inspection monitoring procedures are thorough, no use is made of the data nor concern shown over the unrealistically high pass rate. Vehicle inspection is treated perfunctorily and the minimal inspection procedures reflect this attitude. This sector has made little significant progress and is unlikely to do so without substantial support. Motivational training of the official's concerned and strict enforcement of inspection procedures is needed.

Medical Services

Lack of first aid and prompt transportation to adequate medical support facilities contribute to what medical professionals call the ‘second accident’, where injury severity is worsened for lack of proper care and quick transport services. Payment in advance is often required before a driver will transport an injured person. While major hospitals have ambulances, they are primarily used for non-emergency situations and rarely if ever respond to a road incident scene. In addition, hospital facilities and rehabilitation services are inadequately equipped to provide needed medical attention.

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Initial, on the spot first aid care can contribute greatly to reducing morbidity and injury severity by ensuring the victim is kept breathing, bleeding reduced and shock controlled. Improvements in at-the-scene first aid care.

Information and Data

In order to improve road safety, it is important to determine the causes of road based collisions. At present, the focus of data is on number of incidents and on their severity, in terms of fatalities, injury and casualties. There is a need to establish a mechanism to analyze the cause of every incident.

11.6.3 Strategies for Traffic Management

Traffic Management is the maximum use of existing road space, using traffic operations enforcement, materials and equipment to achieve safe and efficient movement of people and goods. An example of the absence of good traffic management is the chaotic disorder that exists in many areas of the Paurashava today. A major source of traffic problem is poor traffic management. Traffic police have to be posted at critical intersections.

11.7 Plan Implementation

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

11.7.1 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:

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

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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:
 - i. a national road;
 - ii. a regional road;
 - iii. a Zila road;
 - iv. an urban road;
 - v. an Upazila road;
 - vi. a union road;
 - vii. a village road.

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

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

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

Highways Act of England and Wales may be followed.

According to the section 70(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.

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

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

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

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

- (a) construct and maintain drains in, on, under, through or to any land for the purpose of draining water from, or preventing water flowing onto, a public road,
- (b) use any land for the temporary storage or the preparation of any gravel, stone, sand, earth or other material required for the construction or maintenance of a public road.

11.7.2 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) is to 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;

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

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

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

- increased 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 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.

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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 Ordinance, 1982. Attempts may be made to engage NGOs / CBOs / RHD / LGED to work as catalysts in negotiation.

Chapter 12

Drainage and Environmental Management Plan

This Chapter of Part-B (Urban Area Plan) of the Draft Master Plan for Jhikargachha Paurashava, which comprises **Drainage and Environmental Management Plan**. This Chapter has been further subdivided into two parts titled under **Part-A: Drainage Plan** and **Part-B: Environmental Management Plan**.

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

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

Part-A: DRAINAGE PLAN

12.1 Introduction

The purpose of the Drainage Plan is to make an assessment of the present drainage facilities and the scope for future development within 15.448 square kilometer study area of the Islampur Paurashava that consists of partially developed commercial, residential area and infrastructure. The purpose of the survey was to gather information available and use them at the time of the preparation of the Drainage Plan that shall act as a guiding document for designing of drains in future. This Drainage Plan shall be a planning tool and shall be used as a guideline for Islampur Paurashava that shall be responsible for the approval of drainage improvements. In the past, the term drainage included only the hydrologic and hydraulic aspects for discharge of storm runoff. Perhaps the most pressing challenge that now a days we face include the management of our water resources and flood hazard, maintain a continuous supply of water for industrial, agricultural, transportation, recreation, and potable water for present and future generations. The Drainage Plan aspects shall also include the flood and water resources management and pollution abatement. The Drainage Plan will propose improvements necessary to the major drainage systems to accommodate storm runoff of the Islampur Paurashava. This planning process will consider both structural and nonstructural techniques to reduce the effect of the storm runoff which may be summarized as follows:

- i) Improvements to major drainage outfalls;
- ii) Improvement of the drainage network;
- iii) Management of available water resources and
- iv) Conservation of existing natural drainage channels

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12.2 Objectives

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

- a. To allow smooth drainage of storm water and the waste water of the town.
- b. To develop a comprehensive drainage network with area coverage and capacity.
- c. To prevent encroachment to natural drainage system.
- d. To create awareness about disposing of solid waste in the drainage system.

12.2.1 Methodology and Approach to Planning

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

The drains are designed to collect excess rainfall that comes as surface runoff from urban area, convey the runoff and finally discharge them to outfalls. The design of drains involves hydrological computations of rainfall intensity, its frequency of occurrence, duration etc., and the total runoff of a particular catchment area. The US Soil Conservation Service (SCS) method shall be used as an alternative of the Modified Rational Method for larger catchment areas.

In Modified Rational Method, the overall watershed is divided into zones that contribute to hydraulically significant points of concentration. The boundary of the zones is established based upon local topographic boundaries such as streets, existing drainage systems, etc., using good engineering practice.

12.3 Existing Drainage Network

12.3.1 Introduction

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

12.3.2 Existing Drainage System/Network

DRAINAGE NETWORK SURVEY

The drainage system of Jhikargachha Paurashava has been surveyed and classified into two categories: (i) unlined natural khals and manmade canals act as primary drain and reservoir (ii) earthen shallow secondary drains and brick masonry secondary and tertiary drains. One of the primary drains of Jhikargachha Paurashava has been emerged from the abandoned course of the Kapatakkha River which acts as primary drain (Map-12.1). The total length of the Kapatakkha

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River that fall within the Paurashava is measured as 3.29 km whereas total length of Kata Khal, emerged from Kapatakkha River and acts as a natural khal, is about 1.95 km. Rehabilitation of the khals may serve as primary drains and during winter they may be used as source of irrigation water and also for fish cultivation. The river and khals of the Paurashava is listed in Table 12.1 below:

Table 12.1 List of existing natural River/Khal in the Study Area

Sl. No.	Name	Length (km)	Area (Acre)
1	Kapatakkha River	3.29	50.61
2	Kata Khal	1.95	12.05

Source: Field Survey, 2008-2010 by DDC

The secondary and tertiary drains are man-made brick drains, surveyed and shown in the Map-12.1. These drains are constructed by Paurashava from their Annual Development Program and other funds obtained by different government organization. Within the Paurashava a total of 18.33 km tertiary drains have been so far constructed. Moreover, there have no secondary drains been constructed in Jhikargachha Paurashava. The tertiary drains so far constructed in Paurashava are listed in Table 3.2 below.

Table 12.2: List of existing drains in Jhikargachha Paurashava

Drain ID	Width (Ft)	Length (M)	Ward No	Proposed Hierarchy
Ex-D-1	2.00	122.576	Ward_01	Tertiary Drain
Ex-D-2	2.00	137.253	Ward_05	Tertiary Drain
Ex-D-3	5.50	6.082	Ward_04	Tertiary Drain
Ex-D-3	5.50	364.631	Ward_05	Tertiary Drain
Ex-D-4	1.50	39.770	Ward_01	Tertiary Drain
Ex-D-5	2.00	50.274	Ward_04	Tertiary Drain
Ex-D-6	1.50	64.212	Ward_05	Tertiary Drain
Ex-D-7	5.50	194.440	Ward_03	Tertiary Drain
Ex-D-8	2.00	102.389	Ward_02	Tertiary Drain
Ex-D-9	2.00	123.308	Ward_02	Tertiary Drain
Ex-D-9	2.00	0.066	Ward_08	Tertiary Drain
Ex-D-10	3.00	133.217	Ward_03	Tertiary Drain
Ex-D-11	1.00	67.802	Ward_03	Tertiary Drain
Ex-D-12	1.00	102.594	Ward_02	Tertiary Drain
Ex-D-13	1.50	42.305	Ward_03	Tertiary Drain
Ex-D-14	1.50	75.482	Ward_03	Tertiary Drain
Ex-D-15	2.00	60.478	Ward_03	Tertiary Drain
Ex-D-16	1.50	71.381	Ward_03	Tertiary Drain
Ex-D-17	1.50	36.406	Ward_02	Tertiary Drain

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Drain ID	Width (Ft)	Length (M)	Ward No	Proposed Hierarchy
Ex-D-18	2.00	93.060	Ward_04	Tertiary Drain
Ex-D-19	2.00	26.070	Ward_04	Tertiary Drain
Ex-D-20	5.50	182.429	Ward_04	Tertiary Drain
Ex-D-21	10.00	16.781	Ward_04	Tertiary Drain
Ex-D-22	10.00	96.051	Ward_04	Tertiary Drain
Ex-D-23	1.00	159.612	Ward_03	Tertiary Drain
Ex-D-23	1.00	7.381	Ward_04	Tertiary Drain
Ex-D-24	1.00	60.771	Ward_04	Tertiary Drain
Ex-D-25	2.00	347.832	Ward_03	Tertiary Drain
Ex-D-25	2.00	84.093	Ward_04	Tertiary Drain
Ex-D-26	2.00	84.115	Ward_03	Tertiary Drain
Ex-D-26	2.00	2.521	Ward_04	Tertiary Drain
Ex-D-27	2.00	162.159	Ward_04	Tertiary Drain
Ex-D-28	2.00	151.107	Ward_04	Tertiary Drain
Ex-D-29	3.00	53.988	Ward_03	Tertiary Drain
Ex-D-30	2.00	90.150	Ward_03	Tertiary Drain
Ex-D-31	5.00	193.844	Ward_03	Tertiary Drain
Ex-D-32	5.00	209.567	Ward_03	Tertiary Drain
Ex-D-33	5.00	80.543	Ward_03	Tertiary Drain
Ex-D-34	2.50	82.365	Ward_03	Tertiary Drain
Ex-D-35	2.50	38.529	Ward_03	Tertiary Drain
Ex-D-36	0.50	18.979	Ward_01	Tertiary Drain
Ex-D-36	0.50	187.814	Ward_04	Tertiary Drain
Ex-D-37	2.50	45.720	Ward_05	Tertiary Drain
Ex-D-38	2.00	1.175	Ward_02	Tertiary Drain
Ex-D-38	2.00	39.284	Ward_03	Tertiary Drain
Ex-D-39	2.00	15.457	Ward_03	Tertiary Drain
Ex-D-40	2.00	41.246	Ward_01	Tertiary Drain
Ex-D-40	2.00	280.815	Ward_03	Tertiary Drain
Ex-D-41	2.00	40.020	Ward_01	Tertiary Drain
Ex-D-42	2.00	33.806	Ward_06	Tertiary Drain
Ex-D-42	2.00	267.592	Ward_05	Tertiary Drain
Ex-D-43	2.00	53.638	Ward_05	Tertiary Drain
Ex-D-44	2.00	121.478	Ward_05	Tertiary Drain

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Drain ID	Width (Ft)	Length (M)	Ward No	Proposed Hierarchy
Ex-D-45	2.00	123.333	Ward_05	Tertiary Drain
Ex-D-46	2.00	97.562	Ward_05	Tertiary Drain
Ex-D-47	2.00	92.139	Ward_05	Tertiary Drain
Ex-D-48	2.00	86.947	Ward_05	Tertiary Drain
Ex-D-49	2.00	96.543	Ward_05	Tertiary Drain
Ex-D-50	2.00	39.509	Ward_05	Tertiary Drain
Ex-D-51	2.00	170.798	Ward_05	Tertiary Drain
Ex-D-52	2.00	176.742	Ward_05	Tertiary Drain
Ex-D-53	3.00	63.511	Ward_01	Tertiary Drain
Ex-D-54	3.00	55.395	Ward_01	Tertiary Drain
Ex-D-55	1.50	29.995	Ward_01	Tertiary Drain
Ex-D-56	2.00	78.300	Ward_05	Tertiary Drain
Ex-D-57	2.00	48.321	Ward_05	Tertiary Drain
Ex-D-58	2.00	1.395	Ward_02	Tertiary Drain
Ex-D-58	2.00	4.991	Ward_03	Tertiary Drain
Ex-D-59	5.00	9.597	Ward_03	Tertiary Drain
Ex-D-59	5.00	67.036	Ward_04	Tertiary Drain
Ex-D-60	5.00	104.062	Ward_03	Tertiary Drain
Ex-D-61	5.00	78.857	Ward_03	Tertiary Drain
Ex-D-62	2.00	161.830	Ward_03	Tertiary Drain
Ex-D-62	2.00	0.010	Ward_04	Tertiary Drain
Ex-D-63	2.00	21.330	Ward_05	Tertiary Drain
Ex-D-64	2.00	20.829	Ward_04	Tertiary Drain
Ex-D-64	2.00	69.997	Ward_05	Tertiary Drain
Ex-D-65	2.00	130.318	Ward_03	Tertiary Drain
Ex-D-65	2.00	307.538	Ward_04	Tertiary Drain
Ex-D-65	2.00	25.777	Ward_05	Tertiary Drain
Ex-D-66	4.00	217.455	Ward_04	Tertiary Drain
Ex-D-67	2.00	58.384	Ward_03	Tertiary Drain
Ex-D-68	1.50	20.906	Ward_03	Tertiary Drain
Ex-D-69	3.00	175.157	Ward_03	Tertiary Drain
Ex-D-70	5.00	80.569	Ward_03	Tertiary Drain
Ex-D-71	2.00	3.660	Ward_03	Tertiary Drain
Ex-D-71	2.00	77.644	Ward_04	Tertiary Drain

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Drain ID	Width (Ft)	Length (M)	Ward No	Proposed Hierarchy
Ex-D-72	2.00	17.470	Ward_01	Tertiary Drain
Ex-D-72	2.00	167.419	Ward_04	Tertiary Drain
Ex-D-73	2.00	99.872	Ward_03	Tertiary Drain
Ex-D-74	2.00	204.378	Ward_04	Tertiary Drain
Ex-D-75	2.00	21.482	Ward_01	Tertiary Drain
Ex-D-75	2.00	185.679	Ward_04	Tertiary Drain
Ex-D-76	2.00	17.590	Ward_01	Tertiary Drain
Ex-D-76	2.00	138.994	Ward_04	Tertiary Drain
Ex-D-77	2.00	8.769	Ward_05	Tertiary Drain
Ex-D-78	2.00	6.334	Ward_05	Tertiary Drain
Ex-D-79	2.00	6.296	Ward_05	Tertiary Drain
Ex-D-80	2.00	11.930	Ward_05	Tertiary Drain
Ex-D-81	2.00	87.676	Ward_03	Tertiary Drain
Ex-D-82	2.00	65.163	Ward_03	Tertiary Drain
Ex-D-83	2.00	18.619	Ward_04	Tertiary Drain
Ex-D-84	2.00	196.124	Ward_05	Tertiary Drain
Ex-D-85	1.00	195.597	Ward_01	Tertiary Drain
Ex-D-86	2.00	4.481	Ward_08	Tertiary Drain
Ex-D-86	2.00	112.966	Ward_01	Tertiary Drain
Ex-D-87	2.00	2.278	Ward_08	Tertiary Drain
Ex-D-87	2.00	139.370	Ward_01	Tertiary Drain
Ex-D-88	1.50	371.346	Ward_01	Tertiary Drain
Ex-D-89	2.00	80.257	Ward_01	Tertiary Drain
Ex-D-90	2.00	32.616	Ward_01	Tertiary Drain
Ex-D-91	5.00	7.556	Ward_01	Tertiary Drain
Ex-D-91	5.00	54.773	Ward_03	Tertiary Drain
Ex-D-92	3.30	71.721	Ward_02	Tertiary Drain
Ex-D-92	3.30	2.413	Ward_03	Tertiary Drain
Ex-D-93	2.50	57.189	Ward_02	Tertiary Drain
Ex-D-93	2.50	37.949	Ward_01	Tertiary Drain
Ex-D-93	2.50	129.282	Ward_03	Tertiary Drain
Ex-D-94	1.10	13.106	Ward_02	Tertiary Drain
Ex-D-94	1.10	53.028	Ward_01	Tertiary Drain
Ex-D-95	2.00	395.377	Ward_01	Tertiary Drain

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Drain ID	Width (Ft)	Length (M)	Ward No	Proposed Hierarchy
Ex-D-96	2.00	38.597	Ward_01	Tertiary Drain
Ex-D-97	1.00	433.349	Ward_01	Tertiary Drain
Ex-D-98	3.00	53.042	Ward_01	Tertiary Drain
Ex-D-99	1.00	222.872	Ward_01	Tertiary Drain
Ex-D-100	2.00	98.109	Ward_01	Tertiary Drain
Ex-D-101	2.00	61.295	Ward_08	Tertiary Drain
Ex-D-102	2.00	149.743	Ward_08	Tertiary Drain
Ex-D-103	2.00	6.593	Ward_08	Tertiary Drain
Ex-D-103	2.00	214.246	Ward_01	Tertiary Drain
Ex-D-104	2.00	70.415	Ward_06	Tertiary Drain
Ex-D-105	2.00	88.500	Ward_06	Tertiary Drain
Ex-D-106	2.00	80.662	Ward_06	Tertiary Drain
Ex-D-107	2.00	120.558	Ward_06	Tertiary Drain
Ex-D-108	3.00	65.065	Ward_03	Tertiary Drain
Ex-D-109	1.00	115.200	Ward_03	Tertiary Drain
Ex-D-110	4.00	165.302	Ward_06	Tertiary Drain
Ex-D-110	4.00	3.646	Ward_03	Tertiary Drain
Ex-D-111	3.00	71.623	Ward_06	Tertiary Drain
Ex-D-112	3.30	256.408	Ward_06	Tertiary Drain
Ex-D-112	3.30	226.426	Ward_03	Tertiary Drain
Ex-D-113	1.00	114.163	Ward_02	Tertiary Drain
Ex-D-114	2.00	437.407	Ward_06	Tertiary Drain
Ex-D-114	2.00	7.168	Ward_07	Tertiary Drain
Ex-D-115	1.00	312.133	Ward_06	Tertiary Drain
Ex-D-116	2.00	196.390	Ward_06	Tertiary Drain
Ex-D-116	2.00	3.385	Ward_07	Tertiary Drain
Ex-D-117	2.00	552.511	Ward_06	Tertiary Drain
Ex-D-118	2.00	56.338	Ward_06	Tertiary Drain
Ex-D-119	2.00	80.702	Ward_06	Tertiary Drain
Ex-D-120	2.00	164.414	Ward_06	Tertiary Drain
Ex-D-121	2.00	16.169	Ward_06	Tertiary Drain
Ex-D-122	2.00	40.290	Ward_06	Tertiary Drain
Ex-D-123	2.00	285.268	Ward_06	Tertiary Drain
Ex-D-124	2.00	73.684	Ward_06	Tertiary Drain

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Drain ID	Width (Ft)	Length (M)	Ward No	Proposed Hierarchy
Ex-D-124	2.00	4.153	Ward_07	Tertiary Drain
Ex-D-125	2.00	213.784	Ward_06	Tertiary Drain
Ex-D-126	2.00	156.291	Ward_08	Tertiary Drain
Ex-D-127	2.00	50.734	Ward_06	Tertiary Drain
Ex-D-128	2.00	45.047	Ward_06	Tertiary Drain
Ex-D-129	2.00	222.160	Ward_06	Tertiary Drain
Ex-D-130	2.00	3.040	Ward_02	Tertiary Drain
Ex-D-130	2.00	146.237	Ward_06	Tertiary Drain
Ex-D-131	2.00	0.899	Ward_02	Tertiary Drain
Ex-D-131	2.00	128.768	Ward_06	Tertiary Drain
Ex-D-132	2.00	34.664	Ward_06	Tertiary Drain
Ex-D-133	1.00	12.681	Ward_02	Tertiary Drain
Ex-D-133	1.00	172.081	Ward_03	Tertiary Drain
Ex-D-134	2.00	153.353	Ward_02	Tertiary Drain
Ex-D-135	2.00	152.818	Ward_02	Tertiary Drain
Ex-D-136	2.00	107.736	Ward_03	Tertiary Drain
Ex-D-136	2.00	84.959	Ward_04	Tertiary Drain
Ex-D-137	2.00	89.002	Ward_06	Tertiary Drain
Ex-D-137	2.00	72.586	Ward_03	Tertiary Drain
Ex-D-138	2.00	76.504	Ward_03	Tertiary Drain
Ex-D-139	1.00	19.172	Ward_03	Tertiary Drain
Ex-D-140	2.00	16.493	Ward_06	Tertiary Drain
Ex-D-140	2.00	145.657	Ward_03	Tertiary Drain
Ex-D-141	2.00	110.294	Ward_07	Tertiary Drain
Ex-D-142	2.00	112.112	Ward_03	Tertiary Drain
Ex-D-143	2.00	142.774	Ward_04	Tertiary Drain
Ex-D-34	2.50	0.115	Ward_03	Tertiary Drain
Ex-D-81	2.00	0.115	Ward_03	Tertiary Drain
Total:		18332.097		

Source: Field Survey, 2008-2010 by DDC

Part B: Urban Area Plan**11.3.3 Analysis of Land Level (Topography)****Land Levels/Spot Levels**

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

Total 1370 nos. spot values were collected for the study area. The lowest spot height is 3.06m PWD which is located in Ward No.3 in Barbakpur mauza at CS plot number 2175 and the highest spot height is 10.09m PWD which is located in Ward No.5 in Kirtipur mauza at CS plot number 993. Around 59 percent of the spot heights are between 7.01 mPWD to 10.00 mPWD and average height of land of the project area is 8.11 m PWD. Details statistical summary of land levels survey are shown in Table-12.3 and Table-12.4 below:

Table-12.3: Spot Value and Spot Unit

Sl. No.	Spot Unit	Value
1	Total Spot Number	370
2	Mean (Meter)	8.11
3	Maximum Height (Meter)	10.09
4	Minimum Height (Meter)	3.06
7	Standard Deviation	2.11

Source: Topographic Survey by DDC, 2008-2010

Table-12.4: Spot Interval and Frequency

Sl. No.	Spot Interval (mPWD)	Spot Number (Frequency)	Percentage (%)
1	< 5	174	12.7
2	5.01 – 7.00	198	14.5
3	7.01 – 9.00	403	29.4
4	9.01 – 10.00	408	29.8
5	>10.00	187	13.6
Total		1370	100.00

Source: Topographic Survey by DDC, 2008-2010

General Contour Descriptions

Jhikargachha Paurashava is a land of mixed topography. From the spot level readings having the x, y and z values being determinant for the study area, a contour map of the study area has been drawn (Map-12.1: contour map of the study area). The present urbanized area is of having wide range of variation of elevation where minimum spot height is 3.06m PWD and maximum spot height is 10.09m PWD while mean spot height for this area is 8.11m PWD. Mauza wise variations of spot height are depicted in Table-3.5. Project area appears to be no exception as the present contour survey reveals.

Part B: Urban Area Plan**Table-12.5: Variation of Spot Height According to Mauza**

Name of Mauza	Spot (mPWD)		
	Maximum	Minimum	Mean
Barbakpur (33_03)	9.99	3.06	5.61
Hajirali (70_00)	10.63	6.16	9.46
Jhikargacca (34_00)	10.46	3.31	8.44
Kawria (72_01)	10.45	6.9	9.42
Kirtipur (67_01)	10.9	6.08	8.17
Kirtipur (67_02)	10.89	6.66	9.50
Kissnonagar (68_01)	10.8	3.38	8.99
Kissnonagar (68_02)	10.89	3.26	9.24
Mobarokpur (66_00)	10.31	3.48	8.74
Payradanga (65_00)	10.77	3.22	6.95
Purandarpur (69_01)	10.47	3.22	7.96
Purandarpur (69_02)	10.03	3.22	7.38

Source: Topographic Survey by DDC, 2008-2010

12.3.4: Analysis of peak runoff and identification of drainage outfalls

The size and shape of the catchments or sub-catchments for each drain shall be determined by planimeter from 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 intensity 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.

Regarding runoff discharge, it has been observed that there an abandoned branch of Kapatakkha River and a channel from this river named Kata Khal is existed in Jhikargachha Paurashava. Those are the only natural drainage channels which receives part of the runoff volume from part of the town.

The Total Paurashava area has been divided into 5 drainage zones based on analysis of topography, slope, natural and manmade catchment divides and the channel/detention pond (Beel/Doba). Catchment area of this drainage zones/sub C catchment is given in Table-12.6. Outline of these zones along with outfall name has been shown in Map-12.2.

Map no. 12.1: Control/Topographic Map of Jhikargachha Paurashava

Map-12.2: Map of Drainage Zones of Jhikargachha Paurashava

Part B: Urban Area Plan**Table-12.6: Drainage Zones with Outfall Location**

Zone-ID	Name of Outfall	Catchment Area (Acre)
Zone-1	Kapathakha River & Kata Khal	402.01
Zone-2	Kapathakha River & Kata Khal	451.79
Zone-3	Kapathakha River & Jessore-Benapole Road	443.66
Zone-4	Kapathakha River	366.17
Zone-5	Kapathakha River	303.11
Total		1966.74

12.4 Plans for Drainage Management and Flood Control

Management of a drainage system is more difficult than its construction. It requires not only an institutional set up but also huge resources for regular maintenance. The present engineering set up of the Paurashava is highly inadequate to manage the future drainage network. It must be equipped not only with adequate manpower but also with sufficient logistics and resources for sound maintenance. For Jhikargachha Paurashava with its scanty revenue earnings, it will be extremely difficult to go for regular maintenance of the drainage system without government assistance. So, the Paurashava must be provided with sufficient budget allocation for drainage maintenance to go regularly.

12.4.1 Plan for Drain Network Development**12.4.1.1 Drainage Network Plan**

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

12.4.1.2 Proposal for improvement of the existing drain networks

In order to drain out the anticipated future peak runoff to be generated from rainfall due to increase in impervious land cover as well as built-up areas and to mitigate the vulnerability of rainfall induced flooding and water logging, some existing secondary drains have been identified for improvement. Some part of improvement of identified existing drains is shown in **Table 12.7** and details of improvement of existing drains have been shown in **Annexure E**.

Part B: Urban Area Plan**Table-12.7: List of major drains for proposed improvement**

Drain ID	Ward No.	Existing Type	Existing Width (Ft)	Proposed Type	Proposed Width (mm)
Ex-D-3	Ward_05	Tertiary Drain	5.50	Tertiary Drain	800
Ex-D-25	Ward_03	Tertiary Drain	2.00	Tertiary Drain	800
Ex-D-32	Ward_03	Tertiary Drain	5.00	Tertiary Drain	800
Ex-D-40	Ward_03	Tertiary Drain	2.00	Tertiary Drain	800
Ex-D-42	Ward_05	Tertiary Drain	2.00	Tertiary Drain	800
Ex-D-65	Ward_04	Tertiary Drain	2.00	Tertiary Drain	800
Ex-D-88	Ward_01	Tertiary Drain	1.50	Tertiary Drain	800
Ex-D-95	Ward_01	Tertiary Drain	2.00	Tertiary Drain	800
Ex-D-97	Ward_01	Tertiary Drain	1.00	Tertiary Drain	800
Ex-D-112	Ward_06	Tertiary Drain	3.30	Tertiary Drain	800
Ex-D-112	Ward_03	Tertiary Drain	3.30	Tertiary Drain	800
Ex-D-114	Ward_06	Tertiary Drain	2.00	Tertiary Drain	800
Ex-D-115	Ward_06	Tertiary Drain	1.00	Tertiary Drain	800
Ex-D-117	Ward_06	Tertiary Drain	2.00	Tertiary Drain	800
Ex-D-129	Ward_06	Tertiary Drain	2.00	Tertiary Drain	800

12.4.1.3 Proposal for new drains

For effective functioning of existing drainage network, some new drains have been proposed in the project area which is listed in **Table-12.8**. Moreover details of proposed new drains have been shown in **Annexure E**. The list has been prepared based of analysis of topographic map, existing drainage network, field visits and consultation with the Paurashava officials and local people. The proposed drains along with existing drains and other drainage infrastructures are shown in **Map-12.3**.

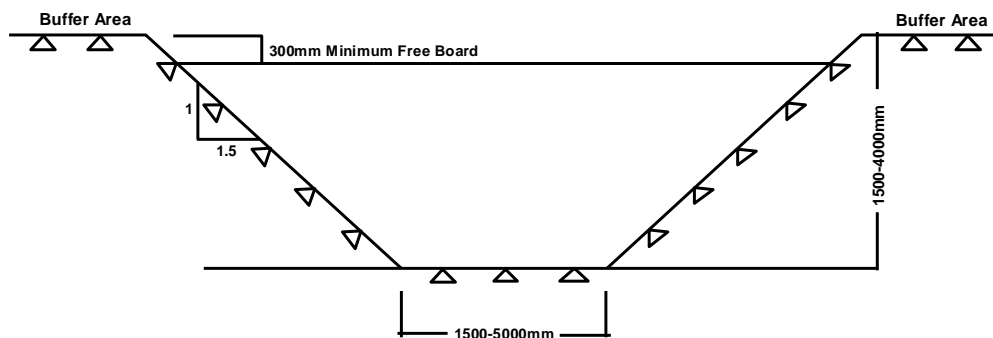
Map-12.3: Drainage Plan Map Detailed Drainage Network Plan of Jhikargachha Paurashava

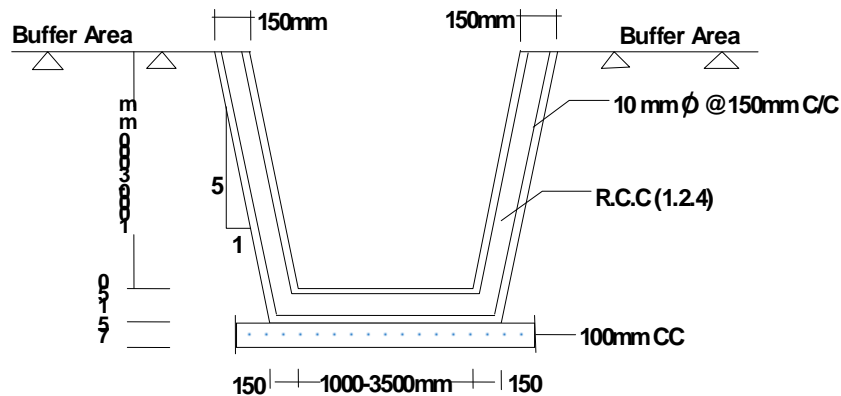
Part B: Urban Area Plan**Table-12.8: List of proposed new drains**

Drain Hierarchy	Drain ID	Ward No.	Length (M)	Out Fall
Primary Drain	PD-4	Ward No 06	1113.865	Kapathakha River
	PD-6	Ward No 07	1235.541	Kapathakha River
Secondary Drain	SD-1	Ward No 01	1330.450	Kapathakha River & Kata Khal
	SD-2	Ward No 01	1063.761	Kapathakha River & Kata Khal
	SD-7	Ward No 09	1014.542	Kapathakha River
	SD-8	Ward No 05	1017.529	Kapathakha River
	SD-8	Ward No 06	1357.947	Kapathakha River
	SD-15	Ward No 05	911.999	Kapathakha River & Kata Khal
	SD-21	Ward No 05	1336.418	Kapathakha River & Kata Khal
	SD-22	Ward No 05	1059.073	Kapathakha River & Kata Khal
	SD-23	Ward No 05	1159.151	Kapathakha River & Kata Khal
Tertiary Drain	TD-1	Ward No 09	884.790	Kapathakha River
	TD-2	Ward No 09	1147.828	Kapathakha River
	TD-3	Ward No 09	1085.599	Kapathakha River
	TD-8	Ward No 05	1005.293	Kapathakha River & Kata Khal
	TD-11	Ward No 05	1306.535	Kapathakha River
	TD-11	Ward No 04	180.128	Kapathakha River

Primary Drain

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

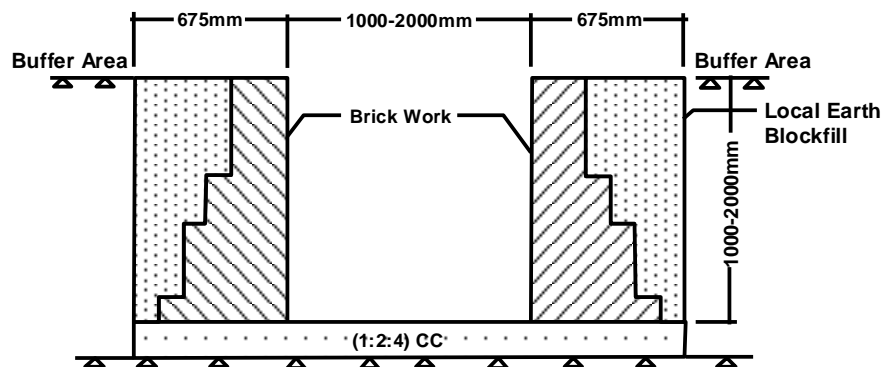
**Figure 12.1: Earthen Primary Drain**

Part B: Urban Area Plan

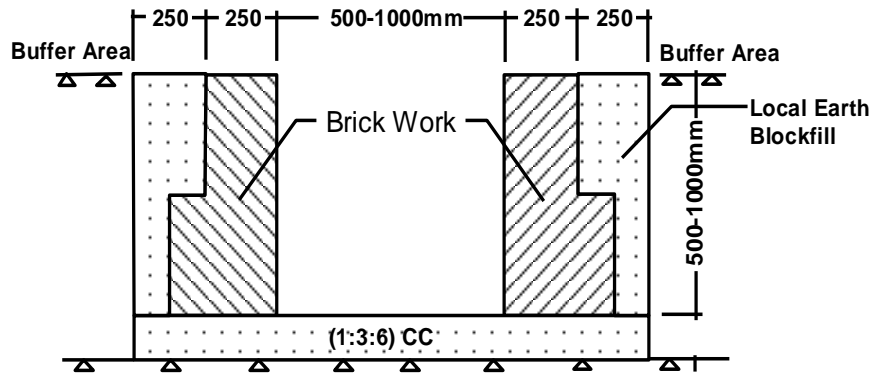
A Typical RCC Primary Drain (Dimensions in mm)

Figure 12.2: Typical RCC Primary Drain**Secondary Drain**

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

**Figure 12.3: Typical Secondary Drain****Tertiary Drain**

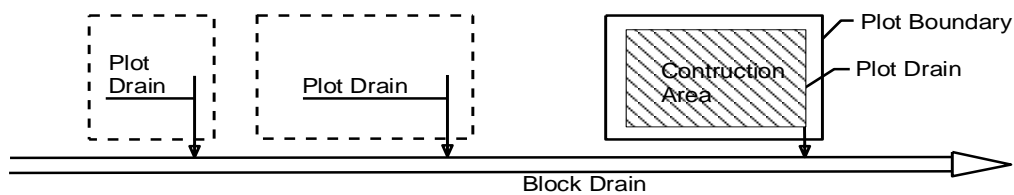
Tertiary drain carry run-off or storm water received from the above mentioned plot drains and block or Mohallah drains. Their catchment area or storm water contributing area is bigger than Mohallah drains. Tertiary drains generally are the under jurisdiction of municipality and city corporation. These drains or drainage networks are constructed and maintained directly by municipalities and City Corporation. These drains are constructed by brick, cement concrete and sometimes by excavating earth in their alignments. These drains may run parallel to road or across the catchment area. Sometimes borrow pits of the road serves as drains provided borrow pits are uniformly and continuously excavated. Borrow pits that serve as drains may be channeled or lined by brick works. Tertiary drains deliver its discharge usually to secondary drains. A typical tertiary drain is shown below:

Part B: Urban Area Plan**Figure 12.4: Typical Tertiary Drain**

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

Plot Drains

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

**Figure 12.5: Plot and Block Drain****Block Drain**

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

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

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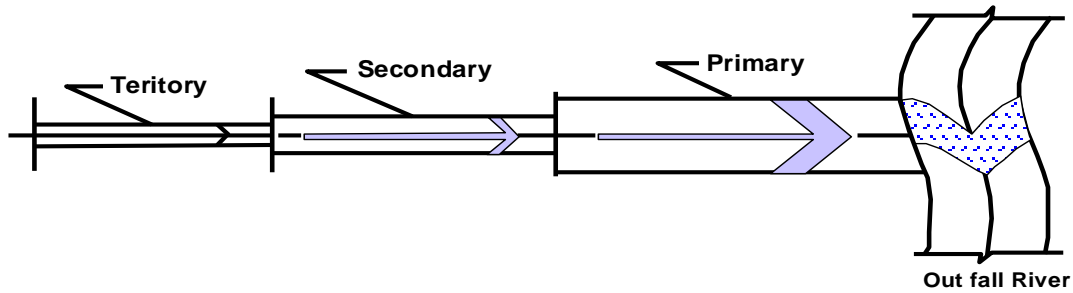


Figure 12.6: Schematic Diagram showing flow directions from Tertiary drains to Outfall

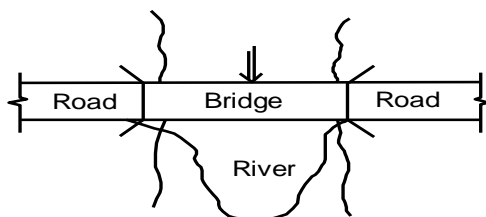
Other Drainage Related Infrastructures

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

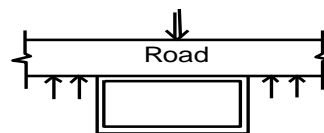
- i. Bridges, culverts, box culverts
- ii. Drainage sluices, pipe sluices, siphons
- iii. Flood protection embankments and flood walls
- iv. Sluice gates, Regulators, Navigation lock
- v. Flood protection and drainage structures.

i) Bridges, Culverts and Box Culverts

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



Definition Sketch Bridge



Definition Sketch Culvert

Figure 12.7: Bridge and Culvert

ii) Drainage sluices, pipe sluices and siphons

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

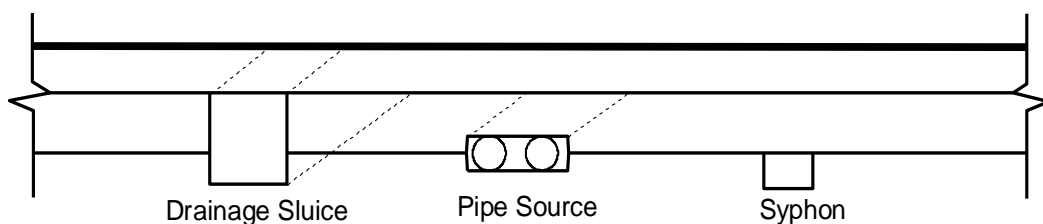


Figure 12.8: Schematic view of Drainage sluice, pipe sluice and siphon on embankment

Part B: Urban Area Plan**Table 12.9: Length of Different Types of Proposed Drains**

Ward No.	Primary Drain (m)	Secondary Drain (m)	Tertiary Drain (m)
Ward No. 1	1348.49	4871.20	14903.66
Ward No. 2	68.89	00	1548.75
Ward No. 3	5.83	1250.67	5138.48
Ward No. 4	00	1292.01	4292.71
Ward No. 5	26.17	5552.08	14206.72
Ward No. 6	1319.29	1357.95	11679.68
Ward No. 7	1243.18	891.24	9388.47
Ward No. 8	10.66	766.49	7752.75
Ward No. 9	00	2020.54	10296.50
Total Length (m)	4022.51	18002.18	79207.72
Total Length (km)	4.02	18	79.21

Embankment

Embankment is a mound of earth or stone built to hold back water or to support a roadway. To protect the surrounding area adjacent to Kapotakkho River from being submerged in Jhikargachha Paurashava, the consultants proposed embankment on both side of that river.

Table 12.10: Length of proposed Embankment

Ward No.	Length (m)
1, 2, 6, 7, 8	4.22

Outfall of Drains

There is no formal outfall of drains in or outside Jhikargachha Paurashava. The primary drains mainly discharge storm water to the nearby khals and borrow pits. But these outfalls are not formally designed. Through the physical infrastructure survey and extensive field observation the consultant has identified outlets to the Kopotakkha river and Kata Khal that pass like spider web through the Paurashava. Most of the katcha drains are closed ended without any outlet that cause overflows in the road and surroundings. The khals ultimately end up in Kopotakkha River. For improvement of drainage new local outfalls are proposed to discharge storm and domestic waste water from tertiary drain to secondary drain as well as primary drains or khals.

Drainage Development Phasing

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

Phase 2: 2016-2021: 13.84 km of Secondary Drains, 30 km of Tertiary Drains

Phase 3: 2021-2025: 14 km of Secondary Drains, 37.59 km of Tertiary Drains

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

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12.5 Plan Implementation Strategies

12.5.1 Regulations to implement the Drainage and Flood Plan

For plan implementation the first requirement would be resources mobilization, which is highly lacking in the Paurashava. Jhikargachha is a small Paurashava with very limited holding tax realized. So, the first strategy will be to increase its revenue and non-revenue earning income. The strategy is to build capacity of the Paurashava to implement the plan. Permission for additional manpower has to be sought from the government. At the same time additional fund has to be provided to pay for salaries and charges. The next strategy will be to create awareness among the citizens not to dispose of solid waste in the drains and get them clogged. This can be done by regular publicity, engaging NGOs for motivation and the last by imposing punitive measures like, fine on the waste disposer. The property owner beside the drains should be made responsible to look after the drains in front of his property and made responsible for any clogging.

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

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

12.5.2 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

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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 clearly and easily understood by all parties concerned. 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 a 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 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

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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 drainage 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 land use management related legislation and zoning scheme regulations.
- Issue of property zoning certificates.
- Investigate and resolve land use management complaints, illegal land use and prosecuting contraventions.

Such interactive windows may be opened in various convenient locations to ensure ease of the answers to commonly asked questions may be shown in the internet. Besides, those may be shown in the print and electronic media time to time. In spontaneous areas, while all out people's co-operation is needed for project implementation; there will also be some elements of negotiation.

B. ENVIRONMENTAL MANAGEMENT PLAN

12.6 Introduction

In environmental study, a multi-disciplinary approach has been used. In the present study data collection was shared with drainage and geology, transport engineering, socio-economic, and topographical survey components. A structured questionnaire prepared by LGED for environmental survey followed.

12.6.1 Objectives

Based on the information and data on the air, water, noise, soil, drainage congestion, 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 objectives of the study.

Following are the objectives of environment management:

- a. To create a sustainable living environment.
- b. To create awareness among citizens about livable environment.

12.6.2 Methodology and Approach to Environmental Study

Environmental survey was conducted following the standard methods and procedures to determine environmental pollutions. Elements of pollutions of urban environment are air, water, land and noise. 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.

12.7 Existing Environmental Conditions

Following is a brief study on the existing environment of Jhikargachha Paurashava .

12.7.1 Geo-morphology

Geology

Being located in the Jessore District, the general soil type is following. The Paurashava belongs to Non-calcareous Brown Floodplain soils group whose main characteristics are: Non-calcareous brown sandy loams to clay loams occurring in the old Himalayan piedmont plain, Tista and Old Brahmaputra floodplains and locally in the old Ganges river floodplain. Soils are slightly too strongly acid in reaction.

The Paurashava is basically a flat land and average 14.30 mPWD above the mean sea level and varying more than 3m in elevation. Kopotakkha River lies along the middle of the Paurashava. And the river has no linkage with Kata Khal.

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Soil

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12.7.2 Climate

The Paurashava belongs to a sub-tropical monsoon climate region. There are six seasons out of which Summer, Winter and Monsoon are the prominent season. Winter starts at November and ends in February. Monsoon period is between July to October.

Winter Season

The winter is the most pleasant time of the year. It is then neither too cold nor too hot. Cool light breezes and clear sky prevails. The temperature sharply falls in November and persists till the minimum is reached in January. The mean minimum temperature in January is 12.88°C while the mean maximum is 25.72°C giving a monthly range of -4.94°C. The mean maximum and mean minimum temperature of the season are 29.78°C and 21.38°C respectively. Rainfall during winter is very low and January is the driest month. The prevailing wind of this season is from north-east.

Summer season

In March, the summer begins and continues until May. May is the hottest month with its 29.05°C mean monthly temperature. The mean maximum and the mean minimum seasonal temperature of the study area are 31.05°C and 24.28°C respectively.

The summer season coincides with the period of nor'-wester thunderstorm, which is locally known as "Kal Baishakhi". As a result there is a marked rise in the rainfall. Rainfall in one storm is usually less than one inch, but sometimes there are heavier showers. An exceptional amount of 20.67" was recorded at Noakhali station on April 30, 1897.

Rainy season or monsoon

With the break of monsoon, which generally occurs in June, the rainy season commences and continues till the end of September or beginning of October. The wind system completely changes its direction during the season. The north-east trade winds disappear and the south-west Monsoon winds start blowing. The south-west Monsoon winds, when crossing the Bay of Bengal pick up moisture from the sea and give heavy rainfall in the district.

Rainfall and Humidity

The Jhikargachha Paurashava has an average normal rainfall of 397.2 mm in the month of July which is highest among all other months. In September, it falls to 327.1 mm; again falling little bit to 229 mm in August. From November to March, this rainfall varies between 28.1 mm to 19.3 mm. The least humid months in the North-eastern areas of Bangladesh are January to March (approx. 60 % relative humidity). In Jhikargachha Paurashava the rate of humidity is less during January to March compare to other months of a year (According to Meteorological Department). Thereafter from June through October the hot and wet monsoon season prevails with southwestern winds that bring heavy rainfall, very high relative humidity (> 80 %).

Part B: Urban Area Plan**12.7.3 Temperature**

Average maximum temperature varies between 30.1° C and 36.3° C and minimum temperature varies between 26.4° C (December) and 24.6° C (January). The hottest months are March, April, May, June and August. From December to February, Paurashava experiences cold periods when temperature varies from 12.5° C (December) to 14.1° C (February).

12.7.4 Humidity

The least humid months in the North- eastern areas of Bangladesh are January to March (approx. 60 % relative humidity). In Jhikargachha Paurashava the rate of humidity is less during January to March compare to other months of a year (According to Meteorological Department). Thereafter from June through October the hot and wet monsoon season prevails with southwestern winds that bring heavy rainfall, very high relative humidity (> 80 %).

12.7.5 Rainfall

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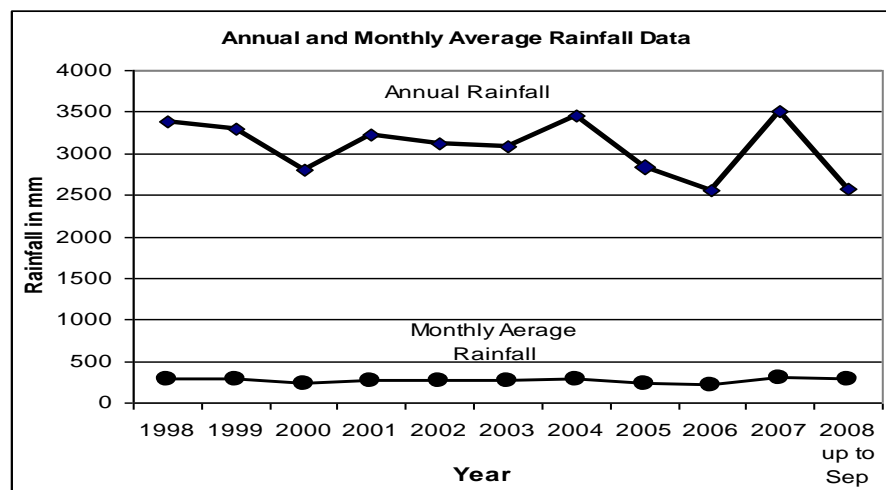


Figure 12.9: Annual and Monthly Average Rainfall Data of Jhikargachha Paurashava

12.7.6 Wind Directions

A cool dry, almost cloudless season from November through February with north-eastern monsoon winds is followed by a transition period, namely the pre-monsoon hot season that comes along with changing wind directions, thunderstorms, and increasing cloud cover from March through May in Jhikargachha of Jessore District. Single rain events in March, April and May might be the characteristic thunderstorms of the hot dry season. The Monsoon season started at the end of May and lasted until end of October. The temperature difference across the interface is large enough to generate the large scale turbulence which, in turn, generates thunderstorms along the interface. General wind speed throughout Bangladesh is shown in **Map 12.4**.

12.7.7 Hydrology

The physiographic situation of the Paurashava is characterized by high land all over the Paurashava. There is a river and two khals situated on Northern and Southern side respectively functioning as main drains in the Paurashava. These are two natural drainage systems in the

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Paurashava. Important features affecting hydrology of the Paurashava are the great amount of rainfall which resulted in water logging and flooding during monsoon period in most of the wards in the Paurashava.

12.7.8 Solid Waste and Garbage Disposal

There is no solid waste management system found in Jhikargachha Paurashava. The people of this Paurashava are not habituated in dumping their garbage and kitchen waste in dustbins. Instead they dump their waste in road side drains, opens space or roads adjacent to their houses. The Paurashava has no solid waste disposal site of its own. It normally dumps the solid waste into low lying areas and canals. Total population of Jhikargachha Paurashava will be 45440 (projected) during the year 2031. Total daily generation of solid waste from Jhikargachha Paurashava is estimated to be 11.36 Metric Tones (considering a generation rate of 0.25 kg/person/day) (Source: Waste Concern, 2008). So several Waste Transfer Stations and one proper Waste Disposal site have to be provided for ensuring proper management of solid wastes in the Paurashava area.

Kitchen Market Waste is generated from the kitchen markets of the town. Good amount of solid waste is generated from the markets. Due to absence of proper solid waste management system, substantial parts of these wastes find their destination in the local canals. Causing filling of the canals resulting in drainage blockage and water logging.

There is no management system to treat **clinical/ hospital waste** separately. However, there are only a few private and government health facilities in the town. No special arrangement has so far been made for treating clinical waste by the Paurashava. Neither the clinics have their own system of disposing clinical waste. These wastes are disposed of as ordinary solid waste. This system of clinical waste is a threat to human health.

Map- 12.4: Mean Annual Rainfall (mm) of Bangladesh

Map- 12.5: General wind speed throughout Bangladesh

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12.7.9 Pollutions

a) Air Pollution

The main sources of air pollution in this Paurashava are emission of harmful gaseous matters from vehicles. Dumping of garbage to open land and ditches make objectionable odor. Besides, industrial operations of flour mills, oil mill, engineering workshop, saw mills, husking mills in Paurashava area are the sources of air pollution to some extent.

Any types of pollution are harmful for human health depending on the nature of pollutant, concentration, duration of exposure and the state of health and age group of the recipient. Polluted air may cause respiratory problem, asthma, bronchitis, headache and dizziness, nasal congestion, renal damage etc.

b) Noise Pollution

Major concern regarding noise pollution in Jhikargachha Paurashava is due to movement of thousands of vehicular traffics through the regional road passing through the Paurashava area. Areas adjacent to both sides of Jessore Road are affected by vehicular noise pollution. Moreover, high concentration of commercial activities in the main bazaar area is also responsible for noise pollution.

c) Water Pollution

Water borne diseases spread out due to the use of polluted water. Water pollution is also another threat of environment of Jhikargachha Paurashava. Surface water is being contaminated from improper sanitation, indiscriminate dumping of domestic solid waste disposal and clinical wastes into the water bodies, and use of chemicals (fertilizers and insecticides) etc. Most of the respondents identified presence of iron beyond acceptable limit is the reason for ground water pollution in Jhikargachha Paurashava. Ground water is mainly used as drinking water and if it is treated for iron removal may lead chronic intestinal diseases of the inhabitants of the Paurashava leading to increase in their health care expenditure.

The hospitals in Jhikargachha Paurashava are producing bacteriological contaminated wastes. A portion of the wastes are dumped into the open drains and canals beside roads which is one of reasons of surface water pollution. Farmers use fertilizers and pesticides in agricultural land. During rainy season it comes in contact with water and as a result pollutes natural water system. No quantified information regarding ground pollution is yet available for Jhikargachha Paurashava.

d) Land Pollution

Land pollution in Jhikargachha Paurashava is significantly low at present situation. Significant number of the respondents claimed to have minimal land pollution in the Paurashava. Most of the respondents said that majority of the existing land pollution occurs due to improper management of domestic wastes disposal. Discharge of industrial wastes and use of chemical fertilizers and pesticides do not have any significant contribution to land pollution of the study area.

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12.7.10 Natural Calamities and Localized Hazards

a. Cyclone and Floods

Inundation has been measured within Paurashava on plinth and above plinth level. Two level of inundation creates following types of damages. When flood reaches plinth level and above plinth level the crop loss occurs in most of the Wards. The Paurashava was not affected by recent flood.

There is no remarkable cyclone occurred in Jhikargachha Paurashava yet.

b. Water Logging

Water logging occurs in the Paurashava during the Rainy season (June-September). Mainly encroachment to natural canal is responsible for this problem. The natural canal is mostly encroached, canal bed filled up or lack of maintenance, is the causes of water logging. The effects are serious health hazards (Flu, Diarrhea and cold and Arsenic contamination of surface water. Also contamination of flora and fauna and agricultural land with chemical fertilizers which lay dumped on the ground. No measures have yet been taken by authority to re excavate the khals.

Inundation within Paurashava areas is experienced in the months of Srabon to Ashwain. Due to influences of rainfall during monsoon, usually the Paurashava suffers from 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 Malshadaha up to .75 ft. In the months of Srabon to Ashwin, the water rises with a height of 2-3 ft. This internal flood or water logging is experienced within the above mentioned Wards during peak monsoon time with high rainfall for long duration. The water logged areas are found along roads, ditches and ponds within Paurashava. There is no attempt to redress Paurashava from Water logging. A proper Drainage Master Plan from LGED and BWDB is required.

c. Fire Hazard

Jhikargachha Paurashava is almost free from fire hazard.

12.7.11 Identifying Major Areas of Threat and Risk

a. Drainage Path Encroachment

There are two canals namely, Kopotakkha River and Kata Khal, a significant portion of which have illegally been encroached by the influential persons. At many points the canals have been blocked by the unauthorized and unplanned waste dumping.

b. Water Pollution

Water borne diseases spread out due to the use of polluted water. Water pollution is also another threat of environment of Jhikargachha Paurashava. Surface water is being contaminated from improper sanitation, indiscriminate dumping of domestic solid waste disposal and clinical wastes into the water bodies, and use of chemicals (fertilizers and insecticides) etc. Most of the respondents identified presence of iron beyond acceptable limit is the reason for ground water pollution in Jhikargachha Paurashava. Ground water is mainly used as drinking water and if it is treated for iron removal may lead chronic intestinal diseases of the inhabitants of the Paurashava leading to increase in their health care expenditure.

Hospitals in Jhikargachha Paurashava are producing bacteriological contaminated wastes. A portion of the wastes are dumped into the open drains and canals beside roads which is one of reasons of surface water pollution. Farmers use fertilizers and pesticides in agricultural land.

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During rainy season it comes in contact with water and as a result pollutes natural water system. No quantified information regarding ground pollution is yet available for Jhikargachha Paurashava.

c. Poor Solid Waste Management

Condition of solid waste management in Jhikargachha Paurashava is very poor. There are only about 28 dustbins including fixed and mobile. For waste collection operation, the Paurashava has only 20 contractual sweepers with only one conservancy inspector. It is reported and observed that, the shop keepers of kitchen markets and the nearby inhabitants dump their wastes into the canals. It is also reported that the Paura Authority itself dump solid wastes in the road side ditches.

12.8 Plans for Environmental Management and Pollution Control

12.8.1 Proposals for Environmental Issues

Following mitigation plan is suggested for various environmental problems.

12.8.1.1 Solid Waste Management

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

Mitigation Measures:

1. Introduction home collection system on community initiative.
2. Creation of solid waste transfer stations at important locations.
3. Creation of a dumping site for disposal of solid waste.
4. Uses of sanitary land fill method for treatment of waste at the dumping site.
5. Introduce recycling of solid waste.

12.8.1.2 Ground Water Pollution

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

Mitigation Measures:

Following mitigation measures may be adopted:

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

12.8.1.3 Surface Water Pollution

Various surface water sources of the town are regularly polluted by deliberate drainage of waste water with respect to pH, turbidity and coliform bacteria when compared with national standard. But present pollution level is low due to low density of population and no industrial agglomeration. The main sources of surface water pollution are urban waste water, sanitary sewage and solid

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waste dumping. With the implementation of this plan the pollution level may further increase as population and activity will increase leading to increase in waste water, sanitary sewage and solid waste dumping.

Mitigation Measures:

1. Abolish katcha and hanging latrines.
2. Encourage practice of sanitary latrines.
3. Take measures against indiscriminate dumping of solid waste.
4. Establish and maintain sanitation conditions of slaughter house, fish market and katcha bazaar.
5. In future set up sewerage treatment plant to treat waste water.

12.8.1.4 Prevention of Encroachment of Natural Khals

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

Mitigation Measures:

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

12.8.1.5 Open Space Promotion

Present open space ratio is only 1.85 acre per thousand populations. If the plan is implemented by the year 2031 the ratio will be 4.32 acres per thousand populations. But there will be hardly any scope to provide further open space. So, the provision of open space must be implemented in the study area for the greater interest of the future urban dwellers.

Mitigation Measures:

1. The open space provisions have to be implemented to save future town environment.
2. Adequate fund need be allotted to execute open space development.
3. No building permission should be accorded in locations earmarked for open space in the master plan.
4. Land owners may be motivated to donate land for open space development.

12.8.1.6 Fire hazard

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

Mitigation Measures:

1. Set up modern fire extinguishing devices.
2. Discourage people from using low quality electrical wire in building and industries.

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3. Ensure periodical checking of electrical lines.
4. Advise busy dwellers about cooking safety.
5. Create awareness among people about the dangers of fire hazard.

12.8.1.7 Pollution Protection Proposals

a. Industrial / Brickfield

There are no large scale industries in Jhikargachha. Only some food processing (bakery, rice/spice mills) goldsmiths exist. So, no significant air pollution is caused by these establishments. The steps to be taken to protect future air pollution are:

- Allow all the industries are in mixed-use areas. Some of them will have to be re-arranged and shifted to the proposed industrial site.
- Green buffers need to be created around the proposed industrial site; it will separate the area from adjacent land uses 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. Wherever it is set up, the chimney should not be less than 120 ft high.

b. Environmental Improvement Awareness Building

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.

The Paurashava is rural based urban area. 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.

c. 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.

12.8.2 Natural Calamities and Hazard Mitigation Proposals

12.8.2.1 Protection Plan Addressing Natural Calamities

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

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Mitigation Measures:

1. Provide housing loan to build houses with permanent materials.
2. Take measures to promote employment and reduce poverty.
3. Take appropriate measures for post disaster loss mitigation.

12.8.2.2 Protection Plan Addressing Regular Hazards

- Most of the natural canals and water courses need to be preserved and maintained. The ponds larger than 0.2 acres should be preserved as water reservoir.
- For the removal of drainage congestion, sufficient number of bridges and culverts should be provisioned during construction of roads.
- Indiscriminate land filling for expansion and construction of residential areas and buildings should be controlled with the imposition of agriculture policy.

12.8.2.3 Protection Plan Addressing Encroachment & Other Relevant Issues

- As a measure of protection from encroachment restrictive buffer zone need to be created on both sides of natural canals and other watercourses (if necessary). Walkways and plantation will be needed for the protection of those buffer zones.
- Formation of appropriate legislation on solid waste management will be necessary. People encroaches canal through dumping of solid wastes. Encroachment on road, canal and river should be removed as early as possible with the formation of joined collaboration committee. This committee may be formed with the members from 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.

12.8.3 Plan Implementation Strategy

For implementation of the mitigation plan emphasis has to be laid on implementing the mitigation measures. Appropriate institutional set up will be required to implement the measures. Government must allocate sufficient budget for this purpose.

12.8.3.1 Regulations to Implement the Drainage and Flood Plan

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

1. Section 3 of the **Acquisition and Requisition of Immovable Property Ordinance, 1982** is needed for acquisition of land in view to construct environmental components. The authority, according to the demand, will apply to the Deputy Commissioner for such acquisition.
2. Section 4 of the **Conservation of Environment Act, 1995** has prescribed duties and responsibilities of the Director. Most of those responsibilities are on the control of pollution.
3. 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.
4. 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.
5. **Water Hyacinth Act, 1936** was enacted for preventing the spread of water hyacinth in Bangladesh and for its destruction. It is said in the section 5 that, no person shall grow or

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cultivate water hyacinth in any garden or in any ornamental water or receptacle. Again, according to the section 8(1) said, with a view to facilitating the discovery or destruction of water hyacinth, an Authorized Officer may, subject to any rules made under this Act, by a notice served in the prescribed manner, direct an occupier of any land, premises or water within a notified area to cause-

- (a) any branches of trees or shrubs on any such land or premises which overhang the edge of any river, stream, waterway, ditch, marsh, bil, lake, tank, pond, pool or pit to be cut back and any undergrowth or jungle thereon to be removed from such edge, within a distance specified in the notice, or
 - (b) any vegetation appearing above the surface of any such water to be removed from the water, within such period as may be specified in the notice.
6. Section 7 of the **Water Resources Planning Ordinance, 1992** will be needed for the development of water resources available in the Paurashava.

12.8.3.2 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).

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

- 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: Public-private partnership can be undertaken by government toward plan implementation. 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:

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Plan Monitoring

For implementation of the drainage 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.

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 land use 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.

Chapter 13

Plan for Urban Service

13.1 Introduction

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

13.2 Basic Urban Services Development Plan

13.2.1 Water Supply

The Paurashava is yet to develop its own network based water supply system. The entire water supply system of the Paurashava is based on household tube well and pond. However, not many of the tube wells provide saline free drinking water. As result hand tube well water is mostly used for washing purpose. Water from ponds is mainly used for drinking. Developing a network based supply system will depend on availability of fresh water aquifer. Detailed geological investigation is required to find out fresh water aquifers. Before that is done Paurashava should take a programme to preserve and maintain all major ponds in the Paurashava. This will require taking over passion of all major waters supply ponds in the Paurashava for the greater interest of the people at large. It has been estimated that by the year 2031 there will demand for 2026260.503 Liter of water in the Paurashava each day. Currently available ponds of the Paurashava will be able to supply a significant amount of water in future, while the rest will be procured from tube wells or by the implementation of piped water supply system. Initially, Paurashava should provide more tube wells for public use.

Table 13.1: Water Supply Proposal

Existing Conditions (2011)		Proposal (2031)	
Number of Paurashava Tube well	109	Number of Paurashava Tube wells to be Provided	-
Number of Ponds available for Water Supply • Private • Public	195	Number of Ponds to be made for Available Water Supply	No

As an alternative to drinking water supply harvesting of rain water may be explored. The idea of rainwater harvesting is unknown to the local people. NGOs working in rain water harvesting training and motivation may be engaged for this purpose. Paurashava may take initiative to prepare a programme for popularising rain water harvesting among the Paurashava people.

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13.2.2 Gas Supply

Gas supply is not available in the entire Paurashava area. Few households have been found using Liquid Petroleum Gas (LPG) for domestic purpose. There are some LPG retail shops within the Paurashava area serving the local demands.

13.2.3 Sanitation

The sanitation facility of the Paurashava is almost satisfactory. Maximum households build individual septic tanks for disposal of human excreta. About 85.91% households are having sanitary latrines of septic tank type. There is no latrine connected to drain. 10.07% households in the Paurashava have unsanitary toilets. During Rainy Season these insanitary latrines cause serious health hazards. Regular contamination of pond water, low-lying area is occurring during water logging.

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

13.2.4 Solid Waste Management

It was observed during the survey that Jhikargachha Paurashava does not possess a well managed system for managing solid wastes generated in the Paurashava area. Solid waste collection and disposal in Paurashava is the responsibility of Paurashava authority. The logistics for collection and disposal of solid wastes include 8 sweepers for collection and 1 garbage truck for transportation. There are 12 dustbins and no dumping site in the Paurashava, CBO or NGO based collection system does not exist within the Paurashava area. Dumping occurs in the ditches which creates major health hazards when season of water logging begins. The authority used to dispose the dumping site for final disposal of the solid waste, but some landowner dump solid wastes to the nearest ditches by their own interest. There is neither any solid waste treatment plant nor any solid waste collection network encompassing entire Paurashava. Paurashava is partly covered by Solid waste collection system around the core part. The sites which are contaminated are Conservancy workers of low living areas around Paurashava.

Total population of Jhikargachha Paurashava will be 45440 (projected) during the year 2031. Total daily generation of solid waste from Jhikargachha Paurashava is estimated to be 11.36 Metric Tons (considering a generation rate of 0.25 kg/person/day) (Source: Wasteconcern 2008).

The consultant proposes 4.90 acres of land for dumping site with treatment plant in ward no 01 (Jhikargacca 34_00 mouza). The site is located in the north-western part of the Paurashava in one corner and away from habitation, easily accessible. As the wind blows from south to north the site will not produce any odor creating nuisance for the nearby residents. The dumping site will be used as sanitary land fill site, where waste will be scientifically treated. It will include methods to contain leachate such as clay or plastic lining material. Deposited waste will be compacted to increase its density and stability, and covered to prevent attracting vermin (such as mice or rats). For landfill gas will be extracted and pumped out of the landfill using perforated pipes and flared off or burnt in a gas engine to generate electricity.

Map- 13.1: Proposed Linear Services Network in Jhikargachha Paurashava

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13.2.5 Electricity

At present, the Rural Electrification Board (REB) is providing electricity facility in all the words within Paurashava area. There is no existing substation within the Paurashava or even in the entire Jhikargachha Upazila. The power is being distributed from PDB sub-station through transmission line to the Paurashava area. With the increase of households and also with the increase of commercial activities in future, the coverage of electricity has to be extended over the entire Paurashava area to meet the growing demand. But the greatest problem of power supply in the entire country remains to be handicapped by the shortage of supply due to low production.

13.2.6 Telecommunication

The town enjoys the networks of all mobile and PSTN telecommunication companies operating in the country. Besides, there also exist landlines of BTCL, the national telephone company. Due to easy and cheaper access to mobile, the demand for land lines has decreased substantially. The consultant has shown land phone line alignment along almost all roads.

Chapter 14

Ward Action Plan

14.1 Introduction

Chapter-14 is concerned about ward level action plans prepared under the frameworks of Structure Plan and Urban Area Plan. This Chapter describes the action plans undertaken for each of the nine wards of the Jhikargachha Paurashava. The action plans contain details of development proposals at ward level that also include the proposals made in upper level plan that is in the Urban Area Plan.

14.1.1 Background

The Ward Action Plan component of the Jhikargachha Paurashava Master Plan has been prepared after a long process of survey and data collection, data analysis and consultation with the stakeholders with public representatives played the key role. It contains the detailed development proposal ward wise that follows the policy, principle and standard in the structure plan and the guidelines set in the Urban Area Plan.

14.1.2 Content

The Ward Action Plan is the plot to plot details of the Master Plan. On that sense it is a micro-level physical development plan. The contents of the Ward Action Plan have been set in the following manner. Prior to plan making a background was set with respect to the demography of the area, where basic statistics of the demographic parameters were discussed. Next, the most critical planning issues were highlighted and reviewed that included, the problems associated with poor conditions of road and drainage, water supply, unplanned development, lack of threshold population. The plan was followed next after review of existing land used and infrastructure. The plan includes, proposed land use zoning, circulation network, drainage plan, municipal services development recommendations, education infrastructure development proposals. The Ward Action Plans were prepared ward wise and all the above issues were repeated for each ward.

14.1.3 Linkage with Structure Plan and Urban Area Plan

Structure Plan is the policy plan of the plan package. It gives the magnitudes and directions of urban growth and principles and policies for development on such issues as, infrastructure networks, the placement of major facilities such as open space, major road, embankment, etc. Taking these guidelines in consideration, the Ward Action Plan (WAP) makes proposals for development at the local level. WAP is the local level translation of the ideas expressed in Structure Plan.

Urban Area Plan is an attempts to guide and accomplishing a coordinated, adjusted, and harmonious development of an urban center and its environs in accordance with present and future needs, best promoting health, safety, morals, order, convenience, property, general welfare, as well as efficiency and economy in the process of development; the forecast of a city's future. The plan lays down the infrastructure and future land use zoning of the planning area. The plan must have layer superimposed on mouza map. WAP details out the development proposals taking the framework plan proposed by Urban Area Plan. WAP makes further detailing of the Urban Area Plan as an upper level plan and takes it to links them to the micro level in order to address the local problems in more vivid fashion.

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14.1.4 Approach and Methodology

The current plan package will follow a combined approach of professional led planning skill integrated with participatory approach. The intention behind such an approach is to make the plan professionally competent as well as reflecting the desires of the stakeholders. The first two plans, that is, structure plan and urban area plan will be framed by the professional planners using their skills and considering the prevailing critical issues and needs giving a technical and professional setting of the total plan. Next, for preparing the ward action plan intensive consultation will be carried out with the stakeholders to make the plan reflect stakeholders' anticipations in the local level development that will directly affect their well being. Ward Action Plan is a kind of detailed area plan guided by the policies and proposals of upper level plans these are structure plan and urban area plan.

14.1.5 Derivation of Ward Action Plan

The basic theme of the WAP is derived from Urban Area Plan. Ward Action Plan (WAP) is the third and the last tier of the current plan package. It elaborates the development plan of an area at plot to plot level. WAP helps adopt the land use zoning prepared by urban area plan, the preceding upper level plan. Development proposals in a WAP will include, detailed infrastructure development plan of all kinds-road, drainage, water supply, sanitation, solid waste management, land allocation for future development and development control regulations. A WAP will be presented in various scales of maps. A plan in a scale of 1'=330' will be prepared for giving planning permission, while larger scale plans will also be prepared to help undertake direct field level development projects. The aim of a WAP is to prevent haphazard urban development and ensure livable environment in areas that are likely to be urbanised soon. Detailing of development proposals in WAP will make development control and implementation of the development proposals easier to identify their exact locations in the field.

14.1.6 Revisiting of Structure Plan and Urban Area Plan

Revisiting Structure Plan

As already stated, structure Plan is the strategic plan that gives the superstructure for the subsequent plan typologies, like, Urban Area plan and Ward Action Plan in the form of strategies and policies. All the strategies policies of Jhikargachha Structure Plan is incorporated in Chapter 7 of the Jhikargachha Master Plan report. Following is a sector wise brief revisit of the Structure Plan policies:

Population

- declaration of population as the most critical sectors of development, emphasize on population control and stress on education promotion.

Economic

- creation of investment climate and emphasize on SME sector investment.

Housing and Slum Improvement

- empowering local government to play better role, emphasize on public private partnership.

Social Amenities and Community Facilities

- using khas /public land and catching the unused/vacant land for providing amenities;

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Transport

- efficient inter-city and intra-city communication for easy transportation of goods and passengers.

Utility Services

- increased revenue collection for providing better services and adoption of participatory approach in service provision.

Urban Area Plan

As an upper level plan, the Urban Area Plan sets forth the future land use and infrastructure development proposals in its Chapter-10, Chapter-11 and Chapter-12 and Chapter- 13. Following are the highlights of the Urban Area Plan proposals:

Chapter-10 of the Urban Area Plan is about **land use** proposals. The plan proposes 16 categories of land uses for future urban area. But over 28% of the available land has been retained as agricultural as much of the current land is under farm use. The population projection and estimated future urban space requirement did not allow more land for urban use reducing the farm land. Residential use fetched about 30.34% of the land excluding about 0.46% of the rural settlement, while about 5.28% land has been earmarked as water body already existing and also that they are non-urban use. Circulation network takes 14.16%, 2.59% manufacturing and processing (general industrial zone) and 2.55% to commercial along with 0.38% mixed use.

Transportation

Road right of way was fixed by the Urban Area Plan as follows:

- Primary Road: RoW 100 - 150 feet
- Paurashava Secondary Road: RoW 60-100 feet
- Paurashava Tertiary Road/Access Road: RoW 20-40 feet

The plan also proposed a road design standard.

The plan proposed a road network plan of about 119.18 km including 57.99 km of new and link road, comprising primary and secondary roads only to enable draw the lower level roads by Ward Action Plan.

14.1.7 Prioritization and Ward Wise Action Plan

Ward Action Plan prioritize first phase (2012 - 2016) development proposal. The plan proposes first phase development plan for transportation facilities including circulation network, drainage proposal, utility services proposal and other development proposals.

Part C: Ward Action Plan**14.2 Ward Action Plan for Ward No. 01**

Ward No. 1 is existed on Barbakpur, Jhikargachha, Kirtipur and Krishnonagar mouza and located on the northern part of the town with a total area of 491.69 acres. After reviewing and commensuration the policies and proposals of Structure Plan and Urban Area Plan the following proposals are made in the Action Plan of Ward No. 01 for implementation within next 5(five) years up to 2016. Land use Plan & Utility Services Plan for Ward No. 01 is shows in **Map-14.1 & Map-14.2** respectively.

14.2.1 Ward Action Plan Proposals**14.2.1.1 Proposed Circulation Network Infrastructure Development**

21.87 km (21866.72 m) of circulation network has been proposed for this ward. Most of these roads will be developed during first phase (2017 - 2021).

Table 14.1: Road Proposals for Ward no. 01

Road ID	Road type	Length (m)	Proposed Width (RoW)	Road Proposal	Phasing
SR-1	Secondary	1002.23	60	Widening	Phase 01
SR-2	Secondary	1087.03	60	New	Phase 01
SR-3	Secondary	294.43	60	Widening	Phase 01
SR-11	Secondary	82.44	60	Widening	Phase 01
SR-12	Secondary	69.85	60	Widening	Phase 01
SR-13	Secondary	234.43	60	Widening	Phase 01
SR-17	Secondary	1359.51	60	New	Phase 01
SR-18	Secondary	673.95	60	New	Phase 01
PR-1	Primary	1245.53	80	Widening	Phase 01
PR-2	Primary	136.99	150	Widening	Phase 01
PR-8	Primary	1207.74	150	Widening	Phase 01
TR-1	Tertiary	350.83	40	Widening	Phase 2,3
TR-2	Tertiary	287.54	40	New	Phase 2,3
TR-3	Tertiary	229.18	40	New	Phase 2,3
TR-4	Tertiary	212.19	40	New	Phase 2,3
TR-5	Tertiary	110.34	40	New	Phase 2,3
TR-6	Tertiary	234.43	40	New	Phase 2,3
TR-7	Tertiary	198.45	40	New	Phase 2,3
TR-8	Tertiary	227.73	40	New	Phase 2,3
TR-9	Tertiary	118.88	40	New	Phase 2,3
TR-10	Tertiary	237.34	40	New	Phase 2,3
TR-11	Tertiary	454.61	40	New	Phase 2,3
TR-12	Tertiary	361.87	40	New	Phase 2,3
TR-13	Tertiary	165.12	40	New	Phase 2,3
TR-14	Tertiary	308.90	40	New	Phase 2,3
TR-15	Tertiary	164.52	40	New	Phase 2,3

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Road ID	Road type	Length (m)	Proposed Width (RoW)	Road Proposal	Phasing
TR-16	Tertiary	451.63	40	Widening	Phase 2,3
TR-17	Tertiary	271.08	40	Widening	Phase 2,3
TR-18	Tertiary	334.35	40	Widening	Phase 2,3
TR-37	Tertiary	168.53	40	New	Phase 2,3
TR-38	Tertiary	77.61	40	New	Phase 2,3
TR-39	Tertiary	172.84	40	Widening	Phase 2,3
TR-40	Tertiary	210.49	40	Widening	Phase 2,3
TR-41	Tertiary	193.19	40	Widening	Phase 2,3
TR-42	Tertiary	142.00	40	New	Phase 2,3
TR-43	Tertiary	794.57	40	New	Phase 2,3
TR-44	Tertiary	370.12	40	New	Phase 2,3
TR-45	Tertiary	246.37	40	New	Phase 2,3
TR-46	Tertiary	290.32	40	New	Phase 2,3
TR-47	Tertiary	434.86	40	New	Phase 2,3
TR-48	Tertiary	314.55	40	New	Phase 2,3
TR-49	Tertiary	286.46	40	New	Phase 2,3
TR-50	Tertiary	259.33	40	New	Phase 2,3
TR-51	Tertiary	327.01	40	New	Phase 2,3
TR-66	Tertiary	2.61	40	New	Phase 2,3
TR-83	Tertiary	417.32	40	New	Phase 2,3
TR-84	Tertiary	114.74	40	New	Phase 2,3
AR-21	Access	206.82	20	New	Phase 2,3
AR-22	Access Road	254.12	20	Widening	Phase 2,3
AR-23	Access Road	88.95	20	Widening	Phase 2,3
AR-24	Access Road	45.60	20	New	Phase 2,3
AR-25	Access Road	152.70	20	New	Phase 2,3
AR-26	Access Road	123.51	20	New	Phase 2,3
AR-27	Access Road	118.28	20	New	Phase 2,3
AR-28	Access Road	75.65	20	New	Phase 2,3
AR-29	Access Road	72.65	20	New	Phase 2,3
AR-30	Access Road	115.96	20	New	Phase 2,3
AR-31	Access Road	135.98	20	New	Phase 2,3
AR-32	Access Road	30.49	20	New	Phase 2,3
AR-33	Access Road	50.10	20	New	Phase 2,3
AR-34	Access Road	35.84	20	New	Phase 2,3
AR-35	Access Road	81.71	20	New	Phase 2,3
AR-36	Access Road	81.71	20	New	Phase 2,3
AR-37	Access Road	30.30	20	New	Phase 2,3
AR-38	Access Road	50.10	20	New	Phase 2,3

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Road ID	Road type	Length (m)	Proposed Width (RoW)	Road Proposal	Phasing
AR-39	Access Road	43.47	20	New	Phase 2,3
AR-40	Access Road	88.18	20	New	Phase 2,3
AR-41	Access Road	123.61	20	Widening	Phase 2,3
AR-42	Access Road	144.00	20	Widening	Phase 2,3
AR-43	Access Road	138.84	20	New	Phase 2,3
AR-44	Access Road	52.07	20	New	Phase 2,3
AR-45	Access Road	69.71	20	New	Phase 2,3
AR-46	Access Road	61.56	20	New	Phase 2,3
AR-47	Access Road	154.51	20	New	Phase 2,3
AR-48	Access Road	103.91	20	New	Phase 2,3
AR-49	Access Road	231.30	20	Widening	Phase 2,3
AR-50	Access Road	49.50	20	New	Phase 2,3
AR-51	Access Road	71.91	20	New	Phase 2,3
AR-52	Access Road	246.99	20	New	Phase 2,3
AR-53	Access Road	176.38	20	New	Phase 2,3
AR-54	Access Road	150.02	20	New	Phase 2,3
AR-55	Access Road	181.03	20	New	Phase 2,3
AR-56	Access Road	142.44	20	New	Phase 2,3
AR-73	Access Road	83.17	20	New	Phase 2,3
AR-74	Access Road	102.97	20	New	Phase 2,3
AR-75	Access Road	121.41	20	New	Phase 2,3
AR-80	Access Road	125.49	20	New	Phase 2,3
AR-86	Access Road	53.91	20	Widening	Phase 2,3
AR-91	Access Road	0.02	20	Widening	Phase 2,3
AR-117	Access Road	97.73	20	New	Phase 2,3
AR-118	Access Road	152.52	20	Widening	Phase 2,3
AR-120	Access Road	7.89	20	Widening	Phase 2,3
AR-122	Access Road	2.66	20	Widening	Phase 2,3
AR-144	Access Road	0.32	20	New	Phase 2,3
AR-256	Access Road	92.45	20	New	Phase 2,3
AR-257	Access Road	63.94	20	Widening	Phase 2,3
AR-263	Access Road	46.24	20	Widening	Phase 2,3
	Total:	21866.72			
Total widening proposal		7.42 km			
Total New Road Proposal		14.43 km			

Besides roads, no bridges and culverts have to be developed hence the existing culverts will make the proposed roads operable.

Map- 14.1: Land Use Plan of Ward No. 01

Map- 14.2: Drainage and Utility Services Plan of Ward No. 01

Part C: Ward Action Plan

Part C: Ward Action Plan**14.2.1.2 Drainage Development Plan**

Presently Ward number 01 of Jhikargachha has no drains. But drain is necessary for discharge all its waste water and storm water. The plan proposes 21.12 km. of new drains for ward no. 01 which will be developed during the second and third phase.

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

Table 14.2: Proposed Drainage Development Plan for Ward 01

Drain Type	Length (m)	Phasing
Primary	1348.49	Phase 1
Secondary	4871.20	Phase 1
Tertiary	14903.66	Phase 2, 3
Total	21123.35	

Table 14.3: Proposals of Utility Services for Ward No. 01

Item	Existing	Proposed (Phase 01)	
	Area/length		Area/Length
Solid Waste Transfer Station	-	One transfer station for the ward	0.62 acre
Solid Waste Dumping Site	-	One for the whole Paurashava	4.9 acre
Water Supply Network	-	Proposed Line Length	19.59 km.
Electricity Line		As per existing program of PDB	

Table 14.4: Proposed Urban Services for Ward No. 01

Item	Existing		Proposed		Phasing
	No.	Area (acre)	No.	Area (acre)	
Bus Stand	-	-	1	0.39	Phase 01
Community Center	-	-	1	0.44	Phase 01
Eidgah	-	-	1	1.53	Phase 01
Health/Maternity Center	-	-	1	0.56	Phase 01
Neighborhood Market	-	-	1	1.96	Phase 01
Neighborhood Park	-	-	1	38.95	Phase 01
Parking	-	-	1	1.61	Phase 01
Playground	-	-	1	1.05	Phase 01
Police Box	-	-	1	0.26	Phase 01
Stadium	-	-	1	12.43	Phase 01
Tempo Stand	-	-	1	0.11	Phase 01
Vocational Training Institute	-	-	1	14.5	Phase 01
Ward Councilor's Office	-	-	1	0.38	Phase 01
Total:				74.17	

Part C: Ward Action Plan**14.3 Ward Action Plan for Ward No.2**

Ward No. 2 is located on the central part of the two and it is the Central Business District area with an area of 19.84 acres. After reviewing and commensuration the policies and proposals of Structure Plan and Urban Area Plan the following proposals are made in the Action Plan of Ward No. 02 for implementation within next 5(five) years up to 2016. Land use Plan & Utility Services Plan for Ward No. 02 is shown in **Map-14.3 & Map-14.4** respectively.

14.3.1 Ward Action Plan Proposals**14.3.1.1 Proposed Circulation Network Development**

Total 4.31 km (4309.49 m) of circulation network has been proposed for this ward. Most of these roads (3.12 km) will be developed during second phase (2017 - 2021). Only 0.21 km new road will be proposed and rest of 0.98 km road widening up to 60 feet during the first phase.

Table 14.5: Road Proposals for Ward 02

Road ID	Road Type	Length (m)	Proposed Width (RoW)	Road Proposal Type	Phasing
SR-3	Secondary	296.90	60	Widening	Phase 02
SR-15	Secondary	242.80	60	Widening	Phase 02
PR-3	Primary	161.59	120	widening	Phase 01
PR-7	Primary	9.77	80	New	Phase 01
TR-25	Tertiary	25.85	40	Widening	Phase 01
TR-103	Tertiary	6.33	40	Widening	Phase 02
AR-78	Access Road	119.15	20	New	Phase 02
AR-79	Access Road	73.53	20	Widening	Phase 03
AR-80	Access Road	638.35	20	New	Phase 03
AR-81	Access Road	81.47	20	Widening	Phase 03
AR-82	Access Road	98.30	20	Widening	Phase 03
AR-83	Access Road	94.15	20	Widening	Phase 03
AR-84	Access Road	42.04	20	Widening	Phase 03
AR-85	Access Road	69.70	20	Widening	Phase 03
AR-87	Access Road	54.03	20	New	Phase 03
AR-88	Access Road	126.37	20	Widening	Phase 03
AR-89	Access Road	66.40	20	New	Phase 03
AR-90	Access Road	2.90	20	Widening	Phase 03
AR-95	Access Road	2.65	20	Widening	Phase 03
AR-101	Access Road	1.23	20	Widening	Phase 03
	Total:	2213.53			
Total widening Proposal		1.32 km			
Total New Road Proposal		0.88 km			

Part C: Ward Action Plan

Map- 14.3: Land Use Plan of Ward No. 02

Map- 14.4: Drainage and Utility Services Plan of Ward No. 02

Part C: Ward Action Plan**14.3.1.2 Drainage Development Plan**

The plan proposes 1.61 km. of new drains for ward no. 02. This drainage plan will be developed during the second phase.

Table 14.6: Proposed Drainage Development Plan Proposals for ward 02

Drain Type	Length (m)	Phasing
Primary	68.89	Phase 1
Tertiary	1548.75	Phase 2, 3
Total	1617.64	

Besides, it will be necessary to re-excavate the Kapatakkha river that flows at eastern side of this ward and acts as the outfall.

Table 14.7 Proposal of Utility Services of Ward No. 02

Item	Existing	Proposed		
	Area/length			Area/Length
Solid Waste Transfer Station	-	One transfer station		0.07 acre
Water Supply Network	-	Proposed Line Length	Phase 02 and 03	2211.99 meters
Electricity Line		As per existing program of PDB		

Table 14.8: Proposed Urban Services of Ward No. 02

Item	Existing		Proposed		Phasing
	Number	Area (Acre)	Number	Area (Acre)	
Community Center	None	-	1	0.06	Phase 01
Health Centre	1	-	1	0.05	Phase 01
Neighborhood Park	None	-	1	2.12	Phase 01
Ward Councilor's office	None	-	1	0.05	Phase 01

Part C: Ward Action Plan**14.4 Ward Action Plan for Ward No.3**

Ward No. 03 is located in the central part of the town. It covers Krishnonagar and Mobarakpur mouza of the town with a total area of 89.49 acres. After reviewing and commensuration the policies and proposals of Structure Plan and Urban Area Plan the following proposals are made in the Action Plan of Ward No. 03 for implementation within next 5(five) years up to 2016. Land use Plan & Utility Services Plan for Ward No. 03 is shows in **Map-14.5 & Map-14.6** respectively.

14.4.1 Ward Action Plan Proposals**14.4.1.1 Proposed Circulation Network Development**

Total 6.72 km (6722.12 m) of circulation network has been proposed for this ward. There are 7.02 km (7025.81 meters) roads will be developed during the first phase (2012 – 2016). In first phase 6.58 km roads will be widened upto 60 feet. Following table shows the detail of roads during the first phase.

Table 14.9: Road Proposals for Ward 03

Road ID	Road Type	Length (Meter)	Right of Way (feet)	Road Proposal	Phasing
SR-3	Secondary Road	229.96	60.00	Widening	Phase 01
SR-4	Secondary Road	326.98	60.00	Widening	Phase 01
SR-6	Secondary Road	0.03	60.00	Widening	Phase 01
SR-6	Secondary Road	72.15	60.00	Widening	Phase 01
SR-12	Secondary Road	3.25	60.00	Widening	Phase 01
SR-13	Secondary Road	305.71	60.00	Widening	Phase 01
SR-15	Secondary Road	5.27	60.00	Widening	Phase 01
SR-16	Secondary Road	48.89	60.00	Widening	Phase 01
PR-3	Primary Road	536.99	120.00	widening	Phase 01
TR-26	Tertiary Road	7.99	40.00	Widening	Phase 02
TR-27	Tertiary Road	110.57	40.00	Widening	Phase 02
TR-28	Tertiary Road	121.48	40.00	Widening	Phase 02
TR-29	Tertiary Road	196.65	40.00	Widening	Phase 02
TR-30	Tertiary Road	96.19	40.00	Widening	Phase 02
TR-33	Tertiary Road	44.54	40.00	Widening	Phase 02
TR-34	Tertiary Road	175.33	40.00	Widening	Phase 02
TR-35	Tertiary Road	1.95	40.00	New	Phase 02
TR-36	Tertiary Road	218.88	40.00	Widening	Phase 02
TR-37	Tertiary Road	110.31	40.00	New	Phase 02
TR-38	Tertiary Road	169.69	40.00	Widening	Phase 02
TR-41	Tertiary Road	61.96	40.00	Widening	Phase 02
AR-17	Access Road	88.45	20.00	Widening	Phase 02
AR-82	Access Road	2.49	20.00	Widening	Phase 02
AR-83	Access Road	1.57	20.00	Widening	Phase 02
AR-90	Access Road	238.93	20.00	Widening	Phase 02
AR-91	Access Road	66.01	20.00	Widening	Phase 02
AR-92	Access Road	37.30	20.00	Widening	Phase 02
AR-93	Access Road	102.82	20.00	Widening	Phase 02

Part C: Ward Action Plan

Road ID	Road Type	Length (Meter)	Right of Way (feet)	Road Proposal	Phasing
AR-94	Access Road	26.42	20.00	New	Phase 02
AR-95	Access Road	117.09	20.00	Widening	Phase 02
AR-96	Access Road	22.01	20.00	New	Phase 02
AR-97	Access Road	70.05	20.00	Widening	Phase 02
AR-98	Access Road	50.10	20.00	New	Phase 02
AR-99	Access Road	43.36	20.00	Widening	Phase 02
AR-100	Access Road	39.67	20.00	New	Phase 02
AR-101	Access Road	302.05	20.00	Widening	Phase 02
AR-102	Access Road	96.49	20.00	New	Phase 02
AR-103	Access Road	97.63	20.00	Widening	Phase 02
AR-104	Access Road	178.86	20.00	New	Phase 02
AR-105	Access Road	176.75	20.00	New	Phase 02
AR-106	Access Road	142.09	20.00	New	Phase 02
AR-107	Access Road	70.44	20.00	Widening	Phase 02
AR-108	Access Road	157.81	20.00	Widening	Phase 02
AR-109	Access Road	110.74	20.00	New	Phase 02
AR-110	Access Road	129.99	20.00	Widening	Phase 02
AR-111	Access Road	376.99	20.00	Widening	Phase 02
AR-112	Access Road	222.36	20.00	Widening	Phase 02
AR-113	Access Road	258.22	20.00	New	Phase 02
AR-114	Access Road	351.45	20.00	New	Phase 02
AR-115	Access Road	152.18	20.00	Widening	Phase 02
AR-116	Access Road	132.51	20.00	Widening	Phase 02
AR-118	Access Road	10.82	20.00	Widening	Phase 02
AR-121	Access Road	3.70	20.00	Widening	Phase 02
Total:		6722.12 (m)			
Total Widening Proposal		5.16 km.			
Total New Road Proposal		1.57 km.			

Besides roads, no bridges and culverts have to be developed and the existing culverts with further development will make the proposed roads operable.

14.4.1.2 Drainage Development Plan

The plan proposes 6.39 km of new drains for ward no. 03. These proposed drains, will be developed during the second and third phase.

Table 14.10: Drainage Development Plan for Ward 03

Drain Type	Length (m)	Phasing
Primary	5.83	Phase 1
Secondary	1250.67	Phase 2
Tertiary	5138.48	Phase 2, 3
Total	6394.98	

Part C: Ward Action Plan**Table 14.11: Proposal of Utility Services in Ward No. 03**

Item	Existing	Proposed	
	Area/length		Area/Length
Solid Waste Transfer Station	-	One transfer station	0.19 acre
Water Supply Network	-	-	6722.12 meters
Electric Sub Station		One station	0.76 acre
Electricity Line		As per existing program of PDB	

Table 14.12: Proposal of Urban Services in Ward No. 03

Item	Existing		Proposed		Phasing
	Number	Area (Acre)	Number	Area (Acre)	
Community Center	-	-	1	0.28	Phase 01
Neighborhood Park	-	-	1	0.73	Phase 01
Health centre	-	-	1	0.25	Phase 01
Playground	-	-	1	0.78	Phase 01
Ward Councilor's Office	-	-	1	0.26	Phase 01

Map- 14.5: Land Use Plan of Ward No. 03

Map- 14.6: Drainage and Utility Services Plan of Ward No. 03

Part C: Ward Action Plan**14.5 Ward Action Plan for Ward No. 04**

Ward No. 04 is located in the central part of the town. It has third highest density of population compare with other wards whereas its total area is about 83.75 acres. After reviewing and commensuration the policies and proposals of Structure Plan and Urban Area Plan the following proposals are made in the Action Plan of Ward No. 04 for implementation within next 5(five) years up to 2016. Land use Plan & Utility Services Plan for Ward No. 04 is shows in **Map-14.7 & Map-14.8** respectively.

14.5.1 Ward Action Plan Proposals**14.5.1.1 Proposed Circulation Network Development**

5.14 km (5144.69 m) of circulation network has been proposed for this ward. There is 1.36 km. roads will be developed during the first phase (2012 – 2016). Hospital road will be widened upto 80 feet during the first phase. Following table shows the detail of roads to be widened 60 to 100 ft. during the first phase.

Table 14.13: Road Proposals for Ward 04

Road ID	Road Type	Length (m)	Proposed Width (RoW)	Proposed Road Type	Phasing
SR-4	Secondary	563.74	60	Widening	Phase 01
SR-6	Secondary	69.28	60	Widening	Phase 01
SR-7	Secondary	0.67	60	Widening	Phase 01
SR-12	Secondary	488.06	60	Widening	Phase 01
SR-13	Secondary	59.68	60	Widening	Phase 01
PR-3	Primary	179.77	120	widening	Phase 01
TR-31	Tertiary	80.42	40	Widening	Phase 02
TR-35	Tertiary	143.92	40	New	Phase 02
TR-36	Tertiary	138.08	40	Widening	Phase 02
AR-57	Access Road	87.95	20	Widening	Phase 02
AR-58	Access Road	56.29	20	New	Phase 02
AR-60	Access Road	215.04	20	Widening	Phase 02
AR-61	Access Road	362.61	20	Widening	Phase 02
AR-62	Access Road	440.28	20	Widening	Phase 02
AR-63	Access Road	57.03	20	New	Phase 02
AR-64	Access Road	143.60	20	New	Phase 02
AR-68	Access Road	575.17	20	New	Phase 02
AR-69	Access Road	71.40	20	New	Phase 02
AR-70	Access Road	57.02	20	New	Phase 02
AR-71	Access Road	56.20	20	New	Phase 02
AR-112	Access Road	3.92	20	Widening	Phase 02
AR-113	Access Road	4.81	20	New	Phase 02
AR-116	Access Road	2.60	20	Widening	Phase 02
AR-117	Access Road	260.58	20	New	Phase 02
AR-118	Access Road	38.65	20	Widening	Phase 02
AR-119	Access Road	92.36	20	Widening	Phase 02
AR-120	Access Road	187.07	20	Widening	Phase 02

Part C: Ward Action Plan

Road ID	Road Type	Length (m)	Proposed Width (RoW)	Proposed Road Type	Phasing
AR-121	Access Road	179.67	20	Widening	Phase 02
AR-122	Access Road	141.91	20	Widening	Phase 02
AR-145	Access Road	111.43	20	Widening	Phase 02
AR-148	Access Road	1.26	20	New	Phase 02
AR-150	Access Road	36.64	20	New	Phase 02
AR-158	Access Road	111.98	20	New	Phase 02
AR-159	Access Road	18.45	20	New	Phase 02
AR-188	Access Road	107.17	20	Widening	Phase 02
	Total:	5144.69			
Total Widening Proposal		3.55 km			
Total New Road Proposal		1.60 km			

Besides roads, no bridges and culverts have to be developed and the existing culverts with further development will make the proposed roads operable.

14.5.1.2 Drainage Development Plan

The plan proposes 5.58 km of new drains which will be developed during the second and third phase.

Table 14.14: Proposed Drainage network of Ward 04

Drain Type	Length (m)	Phasing
Secondary	1292.01	Phase 2 & 3
Tertiary	4292.71	Phase 2 & 3
Total:	5584.72	

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

Table 14.15: Proposal for Utility Services for ward no. 04

Item	Existing	Proposed	
	Area/length		Area/Length
Solid Waste Transfer Station	-	One transfer station	0.12 acre
Water supply network	-	-	5130.63 meters
Electricity Line		As per existing program of PDB	

Table 14.16: Urban services proposed for ward no 04

Item	Existing		Proposed		Phasing
	Number	Area (Acre)	Number	Area (Acre)	
Central Eidgah	None	-	1	4.54	Phase 01
Community centre	None	-	1	0.22	
Neighbourhood Market	None	-	1	1.31	
Ward Councilor's Office	None	-	1	0.11	

Part C: Ward Action Plan

Map- 14.7: Land Use Plan of Ward No. 04

Map- 14.8: Drainage and Utility Services Plan of Ward No. 04

Part C: Ward Action Plan**14.6 Ward Action Plan for Ward No. 05**

Ward No. 05 is located on north western part of the Paurashava with an area of 455.64 acres. After reviewing and commensuration the policies and proposals of Structure Plan and Urban Area Plan the following proposals are made in the Action Plan of Ward No. 05 for implementation within next 5(five) years up to 2016. Land use Plan & Utility Services Plan for Ward No. 05 is shows in **Map-14.9 & Map-14.10** respectively.

14.6.1 Ward Action Plan Proposals**14.6.1.1 Proposed Circulation Network Development**

21 km (20990.03 m) of circulation network has been proposed for this ward. There is 8.68 km. (8681.93 meters) roads will be developed during the first phase (2012 – 2016). All of these roads will be widened. Following table shows the detail of roads to be proposed.

Table 14.17: Road Proposals for Ward 05

Road ID	Road Type	Length (m)	Proposed Width (RoW)	Road Proposal	Phasing
SR-7	Secondary	627.45	60	Widening	Phase 01
SR-8	Secondary	1890.99	60	Widening	Phase 01
SR-9	Secondary	1307.17	60	Widening	Phase 01
SR-10	Secondary	451.06	60	Widening	Phase 01
SR-11	Secondary	448.47	60	Widening	Phase 01
SR-12	Secondary	51.14	60	Widening	Phase 01
SR-14	Secondary	1041.52	60	Widening	Phase 01
SR-19	Secondary	167.37	60	Widening	Phase 01
PR-3	Primary Road	1472.52	120	widening	Phase 01
PR-6	Primary Road	1121.80	120	New	Phase 01
PR-9	Primary Road	105.45	150	Widening	Phase 01
TR-35	Tertiary Road	3.82	40	New	Phase 02
TR-53	Tertiary Road	184.22	40	New	Phase 02
TR-60	Tertiary Road	1009.51	40	New	Phase 02
TR-66	Tertiary Road	447.08	40	New	Phase 02
TR-67	Tertiary Road	194.41	40	New	Phase 02
TR-68	Tertiary Road	280.92	40	New	Phase 02
TR-69	Tertiary Road	152.43	40	New	Phase 02
TR-70	Tertiary Road	260.01	40	New	Phase 02
TR-71	Tertiary Road	265.20	40	New	Phase 02
TR-72	Tertiary Road	265.41	40	New	Phase 02

Part C: Ward Action Plan

Road ID	Road Type	Length (m)	Proposed Width (RoW)	Road Proposal	Phasing
TR-73	Tertiary Road	1156.70	40	New	Phase 02
TR-74	Tertiary Road	323.78	40	New	Phase 02
TR-75	Tertiary Road	323.59	40	New	Phase 02
TR-76	Tertiary Road	326.85	40	New	Phase 02
TR-77	Tertiary Road	93.13	40	New	Phase 02
TR-78	Tertiary Road	145.04	40	New	Phase 02
TR-79	Tertiary Road	383.83	40	New	Phase 02
TR-80	Tertiary Road	172.80	40	New	Phase 02
TR-81	Tertiary Road	505.04	40	New	Phase 02
TR-82	Tertiary Road	414.88	40	New	Phase 02
TR-96	Tertiary Road	325.00	40	New	Phase 02
TR-97	Tertiary Road	213.63	40	New	Phase 02
TR-98	Tertiary Road	49.88	40	New	Phase 02
TR-99	Tertiary Road	119.38	40	New	Phase 02
TR-100	Tertiary Road	57.84	40	New	Phase 02
AR-57	Access Road	172.18	20	Widening	Phase 02
AR-59	Access Road	233.86	20	Widening	Phase 02
AR-60	Access Road	35.36	20	Widening	Phase 02
AR-61	Access Road	2.01	20	Widening	Phase 02
AR-69	Access Road	172.24	20	New	Phase 02
AR-70	Access Road	256.49	20	New	Phase 02
AR-72	Access Road	135.15	20	New	Phase 02
AR-117	Access Road	5.77	20	New	Phase 02
AR-144	Access Road	301.33	20	New	Phase 02
AR-145	Access Road	53.88	20	Widening	Phase 02
AR-146	Access Road	128.47	20	Widening	Phase 02
AR-147	Access Road	425.67	20	New	Phase 02
AR-148	Access Road	53.27	20	New	Phase 02
AR-149	Access Road	161.13	20	New	Phase 02
AR-150	Access Road	128.48	20	New	Phase 02
AR-151	Access Road	55.09	20	New	Phase 02
AR-152	Access Road	140.81	20	Widening	Phase 02
AR-153	Access Road	153.91	20	Widening	Phase 02

Part C: Ward Action Plan

Road ID	Road Type	Length (m)	Proposed Width (RoW)	Road Proposal	Phasing
AR-154	Access Road	135.77	20	Widening	Phase 02
AR-155	Access Road	69.21	20	New	Phase 02
AR-156	Access Road	46.77	20	Widening	Phase 02
AR-157	Access Road	115.99	20	New	Phase 02
AR-159	Access Road	101.33	20	New	Phase 02
AR-169	Access Road	288.64	20	New	Phase 02
AR-170	Access Road	194.23	20	New	Phase 02
AR-171	Access Road	153.42	20	New	Phase 02
AR-172	Access Road	104.29	20	New	Phase 02
AR-173	Access Road	125.04	20	New	Phase 02
AR-231	Access Road	81.04	20	New	Phase 02
AR-232	Access Road	78.69	20	New	Phase 02
AR-233	Access Road	74.85	20	New	Phase 02
AR-234	Access Road	86.55	20	New	Phase 02
AR-235	Access Road	163.82	20	New	Phase 02
AR-245	Access Road	55.65	20	New	Phase 02
AR-246	Access Road	73.75	20	New	Phase 02
AR-262	Access Road	66.55	20	New	Phase 02
	Total:	20990.03			
Total Widening Proposal		8.67 km			
Total New Road Proposal		12.32 km			

14.6.1.2 Drainage Development Plan

The plan proposes 19.78 km of new drains for ward no. 05. All the proposed drain will be developed during the second and third phase.

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

Table 14.18: Proposed Drainage network of Ward 05

Drain Type	Length (m)	Phasing
Primary	26.17	Phase 1
Secondary	5552.08	Phase 2 & 3
Tertiary	14206.72	Phase 2 & 3
Total:	19784.97	

Map- 14.9: Land Use Plan of Ward No. 05

Part C: Ward Action Plan

Map- 14.10: Drainage and Utility Services Plan of Ward No. 05

Part C: Ward Action Plan**Table 14.19: Proposal of Utility Services in Ward No. 05**

Item	Existing	Proposed	
	Area/length		Area/Length
Solid Waste Transfer Station	-	One transfer station	0.41 acre
Water supply network	-	-	20.45 km.
Electricity Line		As per existing program of PDB	

Table 14.20: Proposal of Urban Services for Ward No. 05

Item	Existing		Proposed		Phasing
	Number	Area (Acre)	Number	Area (Acre)	
Bus Terminal	None	-	1	5.37	01
Bus Stand			1	0.86	01
College	None	-	1	3.5	01
Neighborhood Market	None	-	1	6.14	01
Neighborhood Park			1	16.50	01
Playground			1	2.73	01
Police Box			1	0.076	01
Tempo Stand			1	0.39	01
Truck Terminal			1	6.36	01
Waste Transfer Station			1	0.41	01

Part C: Ward Action Plan**14.7 Ward Action Plan for Ward No. 06**

Ward No. 06 is located at the southern part of the Jhikargachha Paurashava with an area of 290.78 acres. After reviewing and commensuration the policies and proposals of Structure Plan and Urban Area Plan the following proposals are made in the Action Plan of Ward No. 06 for implementation within next 5(five) years up to 2016. Land use Plan & Utility Services Plan for Ward No. 06 is shows in **Map-14.11** & **Map-14.12** respectively.

14.7.1 Ward Action Plan Proposals**14.7.1.1 Proposed Circulation Network Development**

14.20 km (14206.86 m) of circulation network has been proposed for this ward. 3.24 km. road proposed for phase one and rest for phase 02.

Table 14.21: Road Proposals for Phase ward 06

Road ID	Road Type	Length (m)	Proposed Width (RoW)	Road Proposal	Phasing
SR-6	Secondary Road	1725.14	60	Widening	Phase 01
SR-7	Secondary Road	202.00	60	Widening	Phase 01
PR-5	Primary Road	1124.29	80	Widening	Phase 01
PR-7	Primary Road	193.86	80	New	Phase 01
TR-19	Tertiary Road	313.47	40	Widening	Phase 02
TR-20	Tertiary Road	253.22	40	Widening	Phase 02
TR-21	Tertiary Road	341.13	40	Widening	Phase 02
TR-26	Tertiary Road	123.05	40	Widening	Phase 02
TR-27	Tertiary Road	66.97	40	Widening	Phase 02
TR-28	Tertiary Road	0.34	40	Widening	Phase 02
TR-30	Tertiary Road	164.63	40	New	Phase 02
TR-34	Tertiary Road	188.42	40	New	Phase 02
TR-36	Tertiary Road	146.64	40	Widening	Phase 02
TR-59	Tertiary Road	1056.58	40	New	Phase 02
TR-103	Tertiary Road	211.33	40	Widening	Phase 02
AR-1	Access Road	29.95	20	New	Phase 02
AR-2	Access Road	114.84	20	New	Phase 02
AR-3	Access Road	47.57	20	New	Phase 02
AR-4	Access Road	11.82	20	New	Phase 02
AR-5	Access Road	57.99	20	New	Phase 02
AR-6	Access Road	54.06	20	New	Phase 02
AR-7	Access Road	51.85	20	New	Phase 02
AR-8	Access Road	64.95	20	Widening	Phase 02
AR-9	Access Road	62.34	20	Widening	Phase 02
AR-10	Access Road	60.04	20	Widening	Phase 02
AR-11	Access Road	58.40	20	Widening	Phase 02
AR-12	Access Road	148.57	20	Widening	Phase 02
AR-13	Access Road	416.29	20	New	Phase 02
AR-14	Access Road	184.58	20	New	Phase 02

Part C: Ward Action Plan

Road ID	Road Type	Length (m)	Proposed Width (RoW)	Road Proposal	Phasing
AR-15	Access Road	184.73	20	Widening	Phase 02
AR-16	Access Road	219.32	20	New	Phase 02
AR-160	Access Road	166.53	20	Widening	Phase 02
AR-161	Access Road	203.03	20	Widening	Phase 02
AR-162	Access Road	119.41	20	Widening	Phase 02
AR-163	Access Road	138.92	20	Widening	Phase 02
AR-164	Access Road	136.87	20	Widening	Phase 02
AR-165	Access Road	75.00	20	Widening	Phase 02
AR-166	Access Road	40.82	20	New	Phase 02
AR-167	Access Road	48.52	20	Widening	Phase 02
AR-168	Access Road	1083.64	20	New	Phase 02
AR-174	Access Road	74.90	20	New	Phase 02
AR-175	Access Road	79.49	20	New	Phase 02
AR-176	Access Road	190.66	20	New	Phase 02
AR-177	Access Road	282.32	20	Widening	Phase 02
AR-178	Access Road	73.84	20	Widening	Phase 02
AR-179	Access Road	78.61	20	Widening	Phase 02
AR-180	Access Road	450.85	20	New	Phase 02
AR-181	Access Road	129.55	20	New	Phase 02
AR-182	Access Road	583.92	20	New	Phase 02
AR-183	Access Road	264.51	20	New	Phase 02
AR-184	Access Road	79.15	20	New	Phase 02
AR-185	Access Road	103.03	20	New	Phase 02
AR-186	Access Road	120.40	20	New	Phase 02
AR-187	Access Road	274.27	20	New	Phase 02
AR-244	Access Road	218.53	20	New	Phase 02
AR-247	Access Road	95.43	20	New	Phase 02
AR-248	Access Road	294.63	20	New	Phase 02
AR-249	Access Road	324.84	20	New	Phase 02
AR-250	Access Road	189.11	20	New	Phase 02
AR-251	Access Road	128.13	20	New	Phase 02
AR-252	Access Road	279.60	20	New	Phase 02
	Total	14206.86			
Total Widening Proposal		6.86 km			
Total New Road Proposal		7.79 km			

Besides roads, no bridges and culverts have to be developed and the existing culverts with further development will make the proposed roads operable.

Part C: Ward Action Plan**14.7.1.2 Drainage Development Plan**

The plan proposes 14.35 meters of new secondary and tertiary drains. Out of which 1.31 km drains are primary, 1.35 km are secondary drains and rests are tertiary drains.

Table 14.22: Proposed Drainage Network of Ward 06

Drain Type	Length (m)	Phasing
Primary	1319.29	Phase 1
Secondary	1357.95	Phase 2 & 3
Tertiary	11679.68	Phase 2 & 3
Total	14356.92	

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

Table 14.23: Proposal of Utility Services in Ward No. 06

Item	Existing	Proposed		Phasing
	Area/length		Area/Length	
Water Supply Network	-	Proposed Line Length	14887.17 meters	Phase 02, 03
Waste Transfer station	-	One station	0.56 acres	Phase 01
Electricity Line		As per existing program of PDB		Phase 01

Table 14.24: Community Facilities for Ward No 06

Item	Existing		Proposed		Phasing
	Number	Area (Acre)	Number	Area (Acre)	
Primary School	1	0.38	1	4.55	Phase 01
Community Center	None	--	1	0.31	Phase 01
Neighborhood market	-	-	1	5.78	Phase 01
Neighborhood park	-	-	1	13.16	Phase 01
Playground	-	-	1	5.73	Phase 01

Map- 14.11: Land Use Plan of Ward No. 06

Map- 14.12: Drainage and Utility Services Plan of Ward No. 06

Part C: Ward Action Plan**14.8 Ward Action Plan for Ward No. 07**

Ward No. 07 is located on southern part of the town Jhikargachha. Mouza Purandarpur covers this entire ward with an area of 343.90 acres. After reviewing and commensuration the policies and proposals of Structure Plan and Urban Area Plan the following proposals are made in the Action Plan of Ward No. 07 for implementation within next 5(five) years up to 2016. Land use Plan & Utility Services Plan for Ward No. 07 is shows in **Map-14.13** & **Map-14.14** respectively.

14.8.1 Ward Action Plan Proposals**14.8.1.1 Proposed Circulation Network Development**

11.76 km (11761.86 m) of circulation network has been proposed for this ward. There are 6.73 km. roads for widening and 5.02 km new road have been proposed. During the first phase (2012 – 2016) 3.36 km road have been proposed for widening and newly construction. Following table shows the detail of roads to be widened up to 100 feet during the first phase.

Table 14.25: Road Proposals for Ward 07

Road ID	Road Type	Length (m)	Proposed Width (RoW)	Road Proposal	Phasing
SR-5	Secondary Road	1385.06	60	Widening	Phase 01
SR-22	Secondary Road	38.63	60	New	Phase 01
SR-23	Secondary Road	1591.80	60	Widening	Phase 01
SR-23	Secondary Road	350.27	60	Widening	Phase 01
TR-56	Tertiary Road	259.06	40	Widening	Phase 02
TR-61	Tertiary Road	279.31	40	widening	Phase 02
TR-63	Tertiary Road	128.37	40	Widening	Phase 02
TR-64	Tertiary Road	329.03	40	New	Phase 02
TR-65	Tertiary Road	183.89	40	New	Phase 02
TR-86	Tertiary Road	1004.50	40	New	Phase 02
TR-87	Tertiary Road	92.94	40	Widening	Phase 02
TR-88	Tertiary Road	336.60	40	New	Phase 02
TR-102	Tertiary Road	152.20	40	Widening	Phase 02
AR-67	Access Road	902.72	20	Widening	Phase 02
AR-76	Access Road	69.09	20	Widening	Phase 02
AR-77	Access Road	109.14	20	New	Phase 02
AR-123	Access Road	263.22	20	Widening	Phase 02
AR-124	Access Road	133.68	20	Widening	Phase 02
AR-125	Access Road	96.08	20	New	Phase 02
AR-126	Access Road	142.52	20	New	Phase 02
AR-127	Access Road	83.00	20	New	Phase 02
AR-128	Access Road	91.34	20	New	Phase 02
AR-129	Access Road	247.57	20	New	Phase 02

Part C: Ward Action Plan

Road ID	Road Type	Length (m)	Proposed Width (RoW)	Road Proposal	Phasing
AR-130	Access Road	56.39	20	New	Phase 02
AR-131	Access Road	58.50	20	New	Phase 02
AR-189	Access Road	100.36	20	New	Phase 02
AR-213	Access Road	165.77	20	New	Phase 02
AR-215	Access Road	234.79	20	New	Phase 02
AR-216	Access Road	244.85	20	New	Phase 02
AR-217	Access Road	63.95	20	New	Phase 02
AR-236	Access Road	290.45	20	Widening	Phase 02
AR-237	Access Road	155.96	20	New	Phase 02
AR-238	Access Road	207.42	20	Widening	Phase 02
AR-239	Access Road	258.29	20	Widening	Phase 02
AR-240	Access Road	202.18	20	New	Phase 02
AR-241	Access Road	95.47	20	Widening	Phase 02
AR-242	Access Road	190.23	20	New	Phase 02
AR-253	Access Road	181.33	20	New	Phase 02
AR-254	Access Road	246.83	20	New	Phase 02
AR-255	Access Road	49.15	20	New	Phase 02
AR-258	Access Road	218.46	20	New	Phase 02
AR-259	Access Road	112.78	20	Widening	Phase 02
AR-260	Access Road	98.74	20	Widening	Phase 02
AR-261	Access Road	62.57	20	Widening	Phase 02
AR-264	Access Road	197.37	20	New	Phase 02
	Total:	11761.86			
Total Widening Proposal		6.73 KM			
Total New Road Proposal		5.02 KM			

14.8.1.2 Drainage Development Plan

Drain is necessary for this ward to discharge all its waste water and storm water. The plan proposes 11.52 km of new drains for ward no. 07.

Table 14.26: Proposed Drainage Development Plan

Drain Type	Length (m)	Phase
Primary	1243.18	Phase 1
Secondary	891.24	Phase 2 and 3
Tertiary	9388.47	Phase 2 and 3
Total	11522.89	

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

Map- 14.13: Land Use Plan of Ward No. 07

Part C: Ward Action Plan

Map- 14.14: Drainage and Utility Services Plan of Ward No. 07

Part C: Ward Action Plan**Table 14.27: Proposal of Utility Services in Ward No. 07**

Item	Existing	Proposed		Phasing
	Area/length		Area/Length	
Solid Waste Transfer Station	-	One transfer station	0.11 acres	Phase 01
Water Supply Network	-	New lines	12.97 km	Phase 02 & 03
Electricity Line		As per existing programs of PDB		

Table 14.28: Proposal of Urban Facilities for Ward No. 07

Item	Existing		Proposed		Phasing
	No.	Area(Acre)	No.	Area (Acre)	
Central Graveyard	-	-	1	7.88	Phase 01
Central Park	-	-	1	34.24	Phase 01
Community Centre	-	-	1	0.16	Phase 01
Health/Maternity Centre	-	-	1	0.153	Phase 01
High School	-	-	1	6.76	Phase 01
Neighbourhood Market	-	-	1	1.32	Phase 01
Neighbourhood Park	-	-	1	0.227	Phase 01
Nursery School	-	-	1	2.73	Phase 01
Playground	-	-	1	9.76	Phase 01
Primary School	1	0.45	1	6.82	Phase 01
Super Market	-	-	1	0.95	Phase 01
Waste Transfer Station	-	-	1	0.11	Phase 01

Part C: Ward Action Plan**14.9 Ward Action Plan for Ward No. 08**

Ward No. 08 is located on north western part of the Paurashava with an area of 281.99 acres. This ward is consists of with Purandarpur and Barbakpur mouza. After reviewing and commensuration the policies and proposals of Structure Plan and Urban Area Plan the following proposals are made in the Action Plan of Ward No. 08 for implementation within next 5(five) years up to 2016. Land use Plan & Utility Services Plan for Ward No. 08 is shows in **Map-14.15 & Map-14.16** respectively.

14.9.1 Ward Action Plan Proposals**14.9.1.1 Proposed Circulation Network Development**

13.29 km (13296.83 m) of circulation network has been proposed for this ward. 7.09 meters roads will be widened during the first phase (2012 – 2016). Following table shows the detail of roads during the first phase.

Table 14.29: Road Proposals for Ward 08

Road ID	Road Type	Length (m)	Proposed Width (Row)	Road Proposal	Phasing
SR-5	Secondary Road	65.12	60	Widening	Phase 01
SR-21	Secondary Road	418.00	60	Widening	Phase 01
SR-24	Secondary Road	0.64	60	Widening	Phase 01
SR-25	Secondary Road	381.36	60	Widening	Phase 01
SR-26	Secondary Road	1.26	60	Widening	Phase 01
SR-27	Secondary Road	822.53	60	Widening	Phase 01
PR-2	Primary Road	656.33	150	Widening	Phase 01
PR-3	Primary Road	681.77	120	widening	Phase 01
SR-27	Secondary Road	840.27	60	Widening	Phase 01
SR-27	Secondary Road	456.79	60	Widening	Phase 01
SR-23	Secondary Road	5.78	60	Widening	Phase 01
TR-52	Tertiary Road	592.29	40	New	Phase 02
TR-85	Tertiary Road	604.27	40	New	Phase 02
TR-90	Tertiary Road	113.21	40	Widening	Phase 02
TR-95	Tertiary Road	174.82	40	New	Phase 02
TR-101	Tertiary Road	596.45	40	Widening	Phase 02
TR-104	Tertiary Road	626.69	40	New	Phase 02
TR-105	Tertiary Road	427.64	40	New	Phase 02
AR-18	Access Road	113.47	20	Widening	Phase 02
AR-19	Access Road	214.32	20	New	Phase 02
AR-20	Access Road	362.93	20	New	Phase 02
AR-65	Access Road	48.03	20	New	Phase 02

Part C: Ward Action Plan

Road ID	Road Type	Length (m)	Proposed Width (Row)	Road Proposal	Phasing
AR-66	Access Road	56.93	20	New	Phase 02
AR-123	Access Road	152.46	20	Widening	Phase 02
AR-132	Access Road	255.73	20	New	Phase 02
AR-139	Access Road	250.80	20	Widening	Phase 02
AR-140	Access Road	107.72	20	Widening	Phase 02
AR-141	Access Road	766.64	20	New	Phase 02
AR-142	Access Road	159.85	20	New	Phase 02
AR-143	Access Road	160.76	20	New	Phase 02
AR-190	Access Road	633.69	20	Widening	Phase 02
AR-191	Access Road	258.07	20	New	Phase 02
AR-192	Access Road	45.91	20	Widening	Phase 02
AR-193	Access Road	90.00	20	Widening	Phase 02
AR-194	Access Road	59.67	20	Widening	Phase 02
AR-195	Access Road	45.89	20	New	Phase 02
AR-218	Access Road	423.43	20	Widening	Phase 02
AR-219	Access Road	279.12	20	New	Phase 02
AR-220	Access Road	49.68	20	New	Phase 02
AR-221	Access Road	47.58	20	Widening	Phase 02
AR-222	Access Road	92.28	20	New	Phase 02
AR-223	Access Road	61.22	20	New	Phase 02
AR-224	Access Road	131.10	20	Widening	Phase 02
AR-225	Access Road	117.76	20	New	Phase 02
AR-226	Access Road	87.25	20	New	Phase 02
AR-227	Access Road	122.23	20	New	Phase 02
AR-228	Access Road	96.50	20	New	Phase 02
AR-229	Access Road	58.80	20	New	Phase 02
AR-230	Access Road	150.43	20	New	Phase 02
AR-253	Access Road	119.32	20	New	Phase 02
AR-254	Access Road	55.07	20	New	Phase 02
AR-264	Access Road	156.95	20	New	Phase 02
	Total	13296.83			
Total Widening Proposal		7.09 km			
Total New Road Proposal		6.20 km			

Part C: Ward Action Plan**14.9.1.2 Drainage Development Plan**

The plan proposes 8.52 km of new drains for ward no. 08. Out of these proposed drains, primary drains will be developed during the first phase.

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

Table 14.30: Proposed Drainage Development Plan

Drain Type	Length (m)	Phase
Primary	10.66	Phase 1
Secondary	766.49	Phase 2 and 3
Tertiary	7752.75	Phase 2 and 3
Total	8529.90	

Table 14.31: Proposal of Utility Services in Ward No. 08

Item	Existing	Proposed	
	Area/length		Area/Length
	None	One transfer station	0.27 acres
Water Supply Network	None	Piped Network	10.17 km.
Water Treatment Plant	None	One plant	9.04 acres
Electricity Line		As per existing programs of PDB	

Table 14.32: Proposed Urban Facilities of Ward No. 08

Item	Existing		Proposed		Phasing
	Number	Area (Acre)	Number	Area (Acre)	
Central Graveyard	None	-	1	1.07	Phase 01
Community Centre	None	-	1	0.5	Phase 01
Crematorium	None	-	1	0.81	Phase 01
Neighborhood park	None	-	1	8.59	Phase 01
Playground	None	-	1	6.6	Phase 01

Map- 14.15: Land Use Plan of Ward No. 08

Part C: Ward Action Plan

Part C: Ward Action Plan

Map- 14.16: Drainage and Utility Services Plan of Ward No. 08

Part C: Ward Action Plan

Part C: Ward Action Plan**14.10 Ward Action Plan for Ward No. 09**

Ward No. 09 is located on north western corner of the Paurashava with an area of 680.32 acres. This ward covers Barbakpur, Hajirali and Kawria mouza of the town. After reviewing and commensuration the policies and proposals of Structure Plan and Urban Area Plan the following proposals are made in the Action Plan of Ward No. 09 for implementation within next 5(five) years up to 2016. Land use Plan & Utility Services Plan for Ward No. 09 is shows in **Map-14.17 & Map-14.18** respectively.

14.10.1 Ward Action Plan Proposals**14.10.1.1 Proposed Circulation Network Development**

15.65 km (15659.59 m) of circulation network has been proposed for this ward. 8.44 km. roads will be widened while 7.21 km. of road will be newly established. Following table shows detailed road proposal:

Table 14.33: Road Proposals for Ward 09

Road ID	Road Type	Length (m)	Proposed Width (RoW)	Road Proposal	Phasing
SR-5	Secondary Road	139.41	60	Widening	Phase 01
SR-20	Secondary Road	733.44	60	Widening	Phase 01
SR-21	Secondary Road	191.18	60	Widening	Phase 01
PR-2	Primary Road	928.82	150	Widening	Phase 01
PR-3	Primary Road	1144.71	120	widening	Phase 01
PR-4	Primary Road	687.43	80	Widening	Phase 01
TR-54	Tertiary Road	773.39	40	Widening	Phase 02
TR-55	Tertiary Road	551.33	40	Widening	Phase 02
TR-57	Tertiary Road	404.26	40	Widening	Phase 02
TR-58	Tertiary Road	125.71	40	New	Phase 02
TR-62	Tertiary Road	240.85	40	Widening	Phase 02
TR-63	Tertiary Road	101.89	40	Widening	Phase 02
TR-64	Tertiary Road	191.30	40	New	Phase 02
TR-85	Tertiary Road	786.89	40	New	Phase 02
TR-89	Tertiary Road	332.45	40	New	Phase 02
TR-90	Tertiary Road	166.93	40	Widening	Phase 02
TR-91	Tertiary Road	759.29	40	New	Phase 02
TR-92	Tertiary Road	919.29	40	Widening	Phase 02
TR-93	Tertiary Road	333.63	40	New	Phase 02
TR-94	Tertiary Road	132.39	40	New	Phase 02
AR-65	Access Road	134.22	20	New	Phase 02
AR-66	Access Road	132.46	20	New	Phase 02
AR-133	Access Road	279.79	20	New	Phase 02
AR-134	Access Road	127.96	20	New	Phase 02
AR-135	Access Road	164.49	20	New	Phase 02
AR-136	Access Road	238.10	20	New	Phase 02

Part C: Ward Action Plan

Road ID	Road Type	Length (m)	Proposed Width (RoW)	Road Proposal	Phasing
AR-137	Access Road	299.43	20	New	Phase 02
AR-138	Access Road	349.37	20	New	Phase 02
AR-196	Access Road	100.39	20	New	Phase 02
AR-197	Access Road	157.72	20	Widening	Phase 02
AR-198	Access Road	119.26	20	New	Phase 02
AR-199	Access Road	169.11	20	New	Phase 02
AR-200	Access Road	85.56	20	New	Phase 02
AR-201	Access Road	190.59	20	Widening	Phase 02
AR-202	Access Road	342.94	20	Widening	Phase 02
AR-203	Access Road	327.27	20	Widening	Phase 02
AR-204	Access Road	85.41	20	New	Phase 02
AR-205	Access Road	197.41	20	Widening	Phase 02
AR-206	Access Road	297.71	20	New	Phase 02
AR-207	Access Road	163.11	20	New	Phase 02
AR-208	Access Road	243.47	20	Widening	Phase 02
AR-209	Access Road	139.25	20	New	Phase 02
AR-210	Access Road	125.23	20	New	Phase 02
AR-211	Access Road	190.75	20	New	Phase 02
AR-212	Access Road	248.20	20	New	Phase 02
AR-213	Access Road	101.48	20	New	Phase 02
AR-214	Access Road	127.61	20	New	Phase 02
AR-215	Access Road	93.03	20	New	Phase 02
AR-217	Access Road	120.05	20	New	Phase 02
AR-243	Access Road	663.63	20	New	Phase 02
	Total	15659.59			
Total Widening Proposal		8.44 km			
Total New Road Proposal		7.21 km			

14.10.1.2 Drainage Development Plan

The plan proposes 11805.70 meters of new drains for ward no. 09. Out of these proposed drains, 3732.37 meters are Secondary drains and 8073.33 meters are Tertiary drains. Besides, it will be necessary to re-excavate the khals that serve as primary drains. The consultants have identified existing whole of the khals need to be re-excavated to allow smooth flow of Water through them.

Table 14.34: Proposed Drainage Development Plan Proposals

Drain Type	Length (m)	Phase
Secondary	2020.54	Phase 1
Tertiary	10296.50	Phase 1
Total	12317.04	

Map- 14.17: Land Use Plan of Ward No. 09

Map- 14.18: Drainage and Utility Services Plan of Ward No. 09

Part C: Ward Action Plan**14.35: Proposal of Utility Services in Ward No. 09**

Item	Existing	Proposed	
	Area/length		Area/Length
Solid Waste Transfer Station	None	One transfer station	0.59 acre
Solid Waste Treatment Plant	None	One Plant	0.95 acre
Water Supply Network	None	-	11808.15 meter
Electricity Line		As per existing programs of PDB	

Table- 14.36: Commercial Facilities for Ward No. 09

Item	Existing		Proposed		Phasing
	Number	Area (Acre)	Number	Area (Acre)	
Cattle Hat & Slaughter house	-	-	1	4.14	Phase 01
Neighborhood market	-	-	1	5.94	Phase 01
Wholesale market	-	-	1	7.74	Phase 01

Chapter 15

Conclusion

15.1 Conclusion

Preparation of the Paurashava development plan is not an end in itself; rather it is an attempt to the beginning of a phase of development of an undeveloped area aspiring for development. Planning is far easier than development. In a developing country like Bangladesh, execution of spatial development plan is really a challenging task for any local government that so vastly rely on the central government for development budget allocation. Amid a host of other priority problems, the central government is often helpless in providing resources for small town's development, where problems are considered less important than those in larger cities. Keeping this constraint in view the local urban governments in smaller towns should emphasise on enhancing the capacity of generating their own resources. Besides, avenues must be searched to recover costs of development from the beneficiaries either directly or indirectly. Direct recovery can be charging development charges or taxes in various forms. Indirectly people can be involved project planning and implementation. This approach of development will benefit in two ways, first, it will create belongingness among people about development of their own areas and second, it will save public money required for development. Land can be procured from land owners for construction of local standard roads. This kind of participatory approach to development would directly benefit the land owner. Without a strong planning section the plans will never come true. There must be someone to take care of the plans and development control effectively. Finally, the Paurashava must give due importance to this plan document to streamline its future development. It must follow the plan for any development, otherwise the plan will lose its credibility and one day it will turn into waste paper which will simply accentuate the town's problems.