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Ministry of Housing and Public Works
Urban Development Directorate (UDD)

Preparation of Development Plan for Fourteen Upazilas
Package-01
(Dohar Upazila, Nawabganj Upazila, Dhaka and Shibchar Upazila,
Madaripur)

DRAFT SURVEY REPORT,
Agricultural Survey
of
Shibchar Upazila, Madaripur

November, 2016
Desh Upodesh Ltd. In Association with AIBL & TechSuS

LETTER OF TRANSMITTAL

To,

25th November, 2016

PD

Preparation of Development Plan for Fourteen Upazilas
Urban Development Directorate (UDD)
82, Segun Bagicha, Dhaka-1000, Bangladesh

Sub: Submission of Shibchar Upazila Agricultural Survey Report

Please find attached to this letter, the Agricultural Survey Report of Shibchar Upazila of Package-1 of the project 'Preparation of Development Plan for Fourteen Upazilas'. The report has been prepared based on Terms of Reference and the subsequent instructions received from your office time to time.

Hope the current report will meet your requirements.

Thanking you so much.

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EXECUTIVE SUMMARY

Bangladesh, a densely populated country where every year, about 1 percent arable land is going out of agriculture due to rapid urbanization and unplanned growth of rural settlement. This trend of land loss is putting tremendous pressure on agriculture and food security in the country. Government of Bangladesh is committed to halt the process and protect its valuable agricultural land through planned development of township and rural settlement. This necessitated planned use of land and vertical growth of agricultural sector to give space for other sectoral development. Integrated policies and programs are envisaged to strike balance between development objective of protecting productive land base and addressing the problem of housing in rural- urban areas.

There are various national policies for agriculture sector development which have implications in the implementation of development programs. Policies are compatible in terms of their avowed goals of increasing productivity and profitability of farming, rapid poverty reduction, increasing productivity and creating income and employment opportunities. The major thrusts of these policies are largely consistent with the MDGs as well as the strategies and future policy priorities of agriculture and rural development policy matrix suggested in the PRSP.

Government. of Bangladesh has decided to follow an inclusive development strategy combining the urban and rural areas and the Urban Development Directorate has taken up an initiative to go for comprehensive planned development of selected upazilas. Shibchar upazila under Madaripur district is one of the selected upazilas, where Government of Bangladesh is going to pilot the endeavors. Basic objectives of the current study are to generate agriculture related information necessary for the preparation of the upazila development plan, so as to facilitate the demarcation of agricultural land on the basis of land and soil properties and suitability for crop production; estimate needs of the local people along with challenges and potential of the land resources for HAVCs production and marketing. For the purpose of the study, both primary and secondary, data have been collected through review of relevant reports & literature, PRAs, formal and informal discussions with multiple stakeholders and household survey. Shibchar Upazila is dominated by medium highland with a complex mixture of calcareous sands and clay alluvium, with some shallowly developed brown loamy soils. Soil organic matter content is low and nutrient level is moderate. Crop agriculture is the major livelihood option in the upazila. Varieties of crops are grown, among which rice, jute, vegetables, oil crops, pulses and spice in the upazila crops are occupied maximum areas. Cropping intensity is about 198% and due to dominance in medium high and medium low land cropping intensity is comparatively low in summer. About 55 % cropped area is irrigated and 45 % are rained. Mechanized cultivation is still limited in land preparation using power tiller and threshing by power thresher. Out of 46584 ha of cropped area 16838 ha (36%) and 1070 ha (2%) is under power thresher operation respectively.

Shibchar is the most potential upazila in respect of fisheries. It is the second livelihood option for small and landless rural families. A varieties of species are produced through poly and monoculture. According to DoF in Shibchar about 40871 ha. land area is under fish culture and total production is 48372 tons annually. During the last 10 years (2005-2015), fish production in the upazila has reduced by 45 percent.

Livestock comprised of poultry rearing, cattle goat/sheep rearing is contributing in nutrition, food security and also providing employment opportunities for rural youths especially women.

There are 67 hat and bazars in the upazila out of those 6 markets have been developed as growth centers. These markets are used for marketing agro-products.

Agriculture in the upazila is constrained by a number of natural as well as man-made challenges. Major natural challenges are river erosion, prolonged drought, monsoon flood, waterlogging, siltation of riverbeds, degradation of water land eco-system etc. affecting fisheries sub-sector.

Agriculture sector of the upazila has immense potentials for growth and development. These includes, organizing producers into groups and their capacity enhancement for technology adoption, accelerating producer's access to quality inputs, rural credit and output. Further to these, capacity enhancement of grass-root level extension personnel, encouragement of private investment in livestock and fisheries sub-sectors and introduction of contract farming system for guaranteed buy back of agro-commodities.

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Agricultural Scientist

Abbreviations and Acronyms

AEZ	:	Agro-Ecological Zone
ASC	:	Agricultural Service Centers
AIBL	:	Aaima International Bangladesh Ltd.
APB	:	Actionable Policy Brief
BADC	:	Bangladesh Agricultural Corporation
BARC	:	Bangladesh Agricultural Research Council
BARI	:	Bangladesh Agricultural Research Institute
BBS	:	Bangladesh Bureau of Statistics
BCCSAP	:	Bangladesh Climate Change Strategic Action Plan
BJRI	:	Bangladesh Jute Research Institute
BL	:	Bottom Land
BMD	:	Bangladesh Meteorological Department
CBO	:	Community Based Organization
CEGIS	:	Center for Environmental and Geographic Information Services
DAE	:	Department of Agricultural Extension
DAM	:	Department of Marketing
DAP	:	Di-Ammonium Phosphate
DLS	:	Directorate of Livestock Service
DTC	:	District Technical Committee
DoF	:	Department of Fisheries
DTW	:	Deep Tube Well
DUL	:	Desh Upodesh Limited.
FAO	:	Food and Agriculture Organisation of the United Nations
FG	:	Farmers group
FGD	:	Focused Group Discussion
FY	:	Financial Year
FYP	:	Five Year Plan
GAP	:	Good Agriculture Practice
GDP	:	Gross Domestic Product
GO	:	Government Organization
GoB	:	Government of Bangladesh
ha	:	Hector
HVACs	:	High Value Agricultural Commodities
HH	:	Household
HL	:	High Land
HVC	:	High Value Crop
ICT	:	Information Communication Technology
ICT	:	Information and Communications Technology
IPM	:	Integrated Pest Management
JV	:	Joint Venture
KII	:	Key Informant Interviews
LL	:	Low Land
LLP	:	Low Lift Pump
MHL	:	Medium High Land
MLL	:	Medium Low Land
MoF	:	Ministry of Food
MoP	:	Muriate of Potash
NAEP	:	National Agricultural Extension Plan

NAES	:	National Agricultural Extension System
NAP	:	National Agriculture Policy
NARS	:	National Agricultural Research System
NCA	:	National Committee on Accreditation
NFP	:	National Food Policy
NGO	:	Non-Government Organization
NLDP	:	National Livestock Development Policy
NSDS	:	National Sustainable Development Strategy
NSP	:	National Seed Policy
NWMP	:	National Water Management Plan
NWP	:	National Water Policy
NTCC	:	National Technical Co-ordination Committee
PA	:	Precision Agriculture
PRSP	:	Poverty Reduction Strategic Plan
RAP	:	Rural Area Plan
RTC	:	Regional Technical Committee
RoI	:	Return of Investment
SCA	:	Seed Certification Agency
SME	:	Small and Medium Entrepreneurs
SPARRSO	:	Bangladeshi Space Research and Remote Sensing Organization
SPSS	:	Statistical Package for the Social Sciences
Sq.Km	:	Square Kilometer
SRDI	:	Soil Resource Development Institute
STW	:	Shallow Tube Well
TechSuS	:	Technical Support Service
TMC	:	Technical Management Committee
ToR	:	Terms of Reference
TSP	:	Triple Super Phosphate
UNFPA	:	United Nations Population Fund
VLL	:	Very Low Land

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CHAPTER-1: INTRODUCTION

1.1 Background

Bangladesh has been branded as a densely populated country and a country of land scarcity. About 169 million people living here with a density of about 1,237 people per sq. km (World Bank, 2015). Vast majority of the population of the country still live in rural area and are directly engaged in a wide range of agricultural activities including crops, fisheries, livestock and forestry. Land is the basic natural resource that provides habitat and sustenance for living organisms, as well as being a major focus of economic and livelihood activities. Agriculture is the major driver of the economy of the country, through sharing of agriculture in national GDP is declining still its contribution in employment is higher than other sectors. Contribution of agriculture in GDP stands at 16.77 % in 2013-14 (Bangladesh Economic Review, 2014). A study conducted by the UNFPA, in 2010 revealed that agriculture sector provides about 47% employment of labor force in Bangladesh (report presented at NEC conference room on 19 Oct. ,2016).

Due to rapid increase of population, unplanned development of rural settlement and rapid urbanization, Bangladesh is losing about 1 percent of its arable land every year. As a result, significant amount of agricultural land is being reduced annually. The process of urbanization is one of the most important dimensions of economic, social and physical development. Rapid urban population growth means an increasing demand for urban land engulfing agricultural land. Urban takes place devouring agricultural lands around urban centres and village settlements. Recent studies revealed that good quality agricultural lands are randomly being used as brickfields all over the country but their concentration is more in the villages adjacent to the big cities. Rapid urbanisation leads to a continuous extension of the city into the rural suburbs, bringing large areas under the direct influence of the urban centres. Around cities, there are dynamic and expanding zones of interaction between urban and rural areas.

According to the 7th Five Year Plan, government policy is to ensure best possible use of land resources and delivery of land related services to the people through modernized and efficient land administration for sustainable development and accelerated poverty reduction. Integrated policies and programs are required to strike balance between the development objectives of protecting the country's productive land base and the problem of housing in rural areas. An appropriate upazila land use plan only can address the aforesaid problems adequately and appropriately. An inclusive development strategy combining the urban and rural areas is the need of the time to make breakthrough in development imbalance. Due importance to planned development of urban centers and their rural hinterlands can produce better results in improving livelihood of the people in general. Organized development of infrastructure and services and control of development can render urban centers congenial places for living and working and serving as the development disseminators to their vast undeveloped rural hinterlands. So far, the secondary and small towns have not been properly addressed in the context of planned development in national policies and strategies. The small urban centers are likely to play a vital role in transforming the vast rural economy including its production and employment. Therefore, more attention is needed to be paid in developing infrastructure and services in smaller

urban centers integrated with their rural zone of influence. There is a need for comprehensive development of upazilas and the upazila headquarters has to be the focal point of all social, administrative, and economic and services of the entire upazila region and bring the services to the doorsteps of the citizens.

Seventh Five Year Plan emphasized on best possible use of land resources and delivery of land related services to the people through modernized and efficient land administration for sustainable development and acceleration of poverty reduction.

In the government's recent policy of overall administrative re-organization, the upazila has been recognized as the most significant tier of the administration. As a local government unit the Upazila Parishad of the project area has not yet been capable of integrating the rural areas with the urban area in, both, physical and socio-economic terms to implement planned rural-urban development. Government of Bangladesh has decided to develop a comprehensive plan for addressing the required land use transformation, arresting unauthorized and unplanned development either in the urban area or in rural area through identifying constraints and potentials and develop to accommodate all social, economic, administrative and infrastructure services. Integration of rural areas with the urban ones will help to utilize the valuable agricultural land properly as well as save it and guide local development in an organized manner.

For sustainable development approach in agriculture, which encompasses a productive, competitive and efficient way to produce and safe agricultural products, while at the same time protecting and improving the natural environment and social/economic conditions of local communities it is utmost important to adopt a well thought land use plan. Land use planning implies development of a common vision of how people, who live in the area and depend on land and other resources for their livelihood, want to use the land in future.

In the above backdrop the Urban Development Directorate under the Ministry of Housing and Public Works of the government has taken up an initiative to go for comprehensive planned development of the entire upazila starting with fourteen upazilas initially. A particular focus of the plan would be the assessment of earthquake risk and vulnerability to suggest measures for hazard mitigation.

One of the selected upazilas of the project is the Shibchar under Madaripur district, where, apart from town development plan, an effort will be made to prepare strategic plan for a sub-region covering adjacent areas of the upazila. The project will also prepare an urban area plan for urban part of the project upazila apart from structure plan for the entire upazila and rural area plans for selected priority projects.

1.2 The Assignment

The primary aim of this project is to improve infrastructure and services to facilitate overall socio-economic development of the entire upazila. Planned urban development will be a special focus of the project in order to equip urban centres with necessary infrastructure and services to serve as the disseminator of development to its vast undeveloped rural hinterland. This objective will be attained through preparation and implementation of long-term structure plan and short-term action area plans with urban area plan and rural area plan in between. Development of rural areas will be

addressed through rural area strategic plan where improvement of agriculture sector will also be in the agenda. Overall regional development will be the gamut of the sub-regional plan where broad based land use categories will be focused with particular attention on conservation of environmentally sensitive areas.

1.3 Objectives of the Study

a. The major objectives of the study according to the terms of reference (ToR) are:

- i) Study on socio-economic condition of the farming community;
- ii) Assessing present land use and present farming practices;
- iii) Identifying challenges constraining agricultural sector and potentials for development;
- iv) Assessing the changes in the land category, agricultural practices and water management;
- v) Demarcating agricultural land in the upazila and superimposing land and cropping information in the maps;
- vi) Preparing action area plan for five years in areas that are needed for immediate development intervention; and
- vii) Prepare rural area plan showing long-term development strategy for 20 years.

b. Other minors are:

- i) Generate information necessary for the preparation of the agricultural development plan;
- ii) To earmark agricultural land for conservation on the basis of land topography (high, medium and low) soil properties (sandy, loamy, loamy sand, clay loam and clay) and crop suitability (high, moderate and low) for crop production in the face of rapid transformation of arable lands into nonagricultural ones;
- iii) To identify needs of the local population for growing high value agricultural commodities (HVCs);
- iv) To identify challenges and potentials of HVCs production and value chain management in the urban fringe as well as in apparent rural areas;
- v) Delineation of land according to single, double and triple cropping potentials as well as productivity and overlaying the information on proposed land uses along with recommendations for specific land use practices considering constraints;
- vi) Developing several layers of information on socio-economic condition of the farming community, traders, entrepreneurs and market infrastructure for agro-commodities to be included in the Rural Area Plan (RAP).
- vii) Propose a short, medium and long-term development plan for sustainable agricultural development.

1.4 Brief Description of Shibchar Upazila

Shibchar is a developing upazila under Madaripur district, situated on the banks of the river Padma. It lies in the floodplain of the mighty Padma and Arial Khan rivers and greatly influenced by the dynamic hydro-morphological process of erosion and accretion of the rivers. It is located in between 23°15' and 23°30' north latitudes and in between 90°05' and 90°17' east longitudes. The upazila is bounded by the Padma river, Lohajang upazila of Munshigonj and Sadarpur upazila of Faridpur district on the

north, Rajoir and Madaripur sadar upazilas on the south, Zanjira upazila of Sariatpur on the east and Bhanga upazila of Faridpur on the west. Total area of the upazila is about 332.90 km².

It has 19 unions and one Municipality. The under-construction Padma Multipurpose Bridge linking Mawa of Munshigonj and Kawrknadi of Madaripur will play a vital for the local economy and make the upazila a hinterland of Dhaka Megacity.

Fertile plain land, vegetation, river sand, canals and beels etc. bless the upazila. The agro-climatic condition of the upazila is suitable for cultivation of multiple crops. About 59 percent of the land is intensively cultivated (Consultation workshop at DAE, Shibchar, 1016). Being comprised predominantly of medium high and medium low land, varieties of crops, most of which are high value such as jute, wheat, maize, pulses, sweet potato, onion, garlic, chilli, mustard, vegetables, etc. are grown here. The main crops grown in the area is boro rice or dry season rice. On the other hand, the aus rice covers a small area.

Rivers and beels support major subsistence and commercial fisheries, while the seasonally flooded lake margins support major rice-growing activities, and the abundant aquatic vegetation provides rich grazing for domestic livestock and an alternative source of fuel and fertilizers for the local people. Major land uses of the upazila are agriculture, housing, forest, water body, inland capture fisheries and culture fisheries, etc. On the other hand, the upazila is susceptible to natural and human induced disasters like flood, siltation, erosion, drought, water pollution, loss of fertile agricultural land and housing in agricultural land etc.

Various human interventions are key players responsible for degradation of valuable land resources. Land use pattern of the upazila is changing, creating pressure on land resources. Absence of pragmatic strategies towards conservation of natural resources has been experiencing a high degree of environmental degradation of Shibchar Upazila.



Map-1. 1: Shibchar Upazila (Source: Webpage: Banglapedia, 2015)

1.5 Approaches and Methodologies

Different approaches and methodologies have been followed in the study. These are, review of secondary information, household survey, consultation with stakeholders, analysis of national policies and plans, analysis of collected data and synthesis of information. The detailed discussions of approaches and methodologies are made in the following paragraphs.

1.5.1 Approaches

- Review of secondary information
- Household survey for quantitative data
- Rapid Appraisals like, FGDs, purposive visits, in-depth interviews, and formal & informal discussion with various stakeholders
- Overlaying collected information on satellite imagery
- Data processing using statistical packages for social science (SPSS) and Micro-soft Excel.
- Data analyzing following SPSS
- Preparation and submission of report addressing comments of different stakeholders and especially TMC members.

1.5.2 Methodology

a) Data Collection

Primary Data Collection

Both quantitative and qualitative primary data, related to land and soil type, existing land use and cropping pattern have been collected through a number of sequential steps as follows:

i) Household Survey: Quantitative data relevant to peri-urban (the grey area which is neither entirely urban nor purely rural in the traditional sense) and rural agricultural activities at household level has been collected through sample survey using a semi-structured questionnaire. HH survey program of the study had a section for farm household information of agricultural practices, current land use along with irrigation facilities & farm mechanization, present cropping system, cropping pattern and level of technology use by farmers especially for producing high value agricultural commodities (HVACs). Stratified random sampling procedure was adopted to select the size of the sample with 95% confidence level and ± 5 precision level. HH survey has been conducted with a sample of 555 respondents.

ii) Qualitative Data Collection: For qualitative data collection one focus group discussion (FGD) with DAE field officials, three key informant interviews (KIIs) with DAE, DLS and Fisheries officers at upazila level have been conducted.

iii) Secondary Data Collection: Secondary data related to land and soil type, existing land use and cropping pattern of the upazila has been collected through reviewing of secondary information as follows:

- Information about soil suitability of urban fringe and rural areas have been collected from SRDI and BARC and other NARS Institutes;
- Present status of crop, livestock and fishery related statistics have been collected from BBS, DAE, DLS and DoF;
- The base map, water resource maps, land use maps and other related information of the study area have been collected from SRDI, BARC and Bangladesh Space Research & Remote Sensing Organization (SPARRSO);
- Other relevant documents have been collected from different books, Journals, and Web domains;

b) Data Processing and Analysis

Collected data has been processed using different techniques. The primary data has been processed by statistical package for social science (SPSS) and Microsoft Excel.

CHAPTER-2: AGRICULTURAL POLICY FRAMEWORK

2.1 Introduction

In order to face the ultimate challenges of food scarcity against constantly increasing population, the Government of Bangladesh has taken a number of initiatives on policy formulation and their implementation.

Development of the agriculture sector is generally governed by a number of related national policies. National Agriculture Policy (NAP) 2013 is obviously the key guiding document for implementation of development agenda for the sector. The other related policy documents are New Agricultural Extension Policy (NAEP) 1996, National Food Policy (NFP) 2006, National Fisheries Policy 1996, National Livestock Policy 2007, National Water Policy 1999, National Forestry Policy 1994, National Integrated Pest Management Policy 2002, National Poultry Development Policy 2008 and the overarching National Sustainable Development Strategy (NSDS) 2013.

2.2 National Agriculture Policy, 2013

The prime objective of the National Agriculture Policy (NAP, 2013) is to ensure food and nutrition security for all and to improve the quality of life of the rural people through increased productivity and agricultural diversification. The document emphasizes sustainability and profitability agricultural production; research and extension; productivity enhancement; employment and income generation through commercialization, adaptability to climate change, developing market, agro-processing and agro-based industries, and promoting export of agricultural products. The policy stressed the need for innovative improvement for e-agriculture and use of Information and Communications Technology (ICT) in agricultural extension. To ensure farm level supply of quality seeds, the policy encourages participation of private sector along with public sector in seed production and marketing. The quality issue of seed and fertilizer were sufficiently emphasized in the document. For judicious use of water resources in farming; the policy emphasized enhancing water use efficiency. It encouraged use of surface water and solar energy for irrigation, wherever possible. For water scarce areas it suggested using force mode pump instead of suction mode pump. In case of agricultural machinery, the policy suggested to continue import subsidy and encourage innovation of climate sensitive technologies.

The NAP, 2013 duly emphasized developing agricultural marketing system through improving infrastructure and establishing uninterrupted value chain between producers and consumers. The policy suggested establishing local level storage facilities and agro-processing industries. The document also mentioned the importance of women involvement in different agricultural activities, particularly in homestead gardening, seed production, bee rearing, food processing and storage etc. It also suggested for elimination of wage discrimination between men and women in agriculture.

The NAP, 2013 recognized several weaknesses and threats, which may hinder successful implementation of different programmes. The constraints include less developed market infrastructure, lack of diversification, and high volume of post-harvest loss, financial constraints, limited availability of agricultural credit from formal sources, inadequacy of climate sensitive agricultural technologies and inadequate use of ICT technologies. The development of the sector is also threatened

by factors like, environmental hazards, deteriorating soil quality, continued reduction of arable land and water, loss of agricultural bio-diversity, excessive and imbalanced use of pesticides and inadequate budgetary allocation especially for agricultural research.

Very little or no progress has been observed in the light of NAP 2013 in respect of value chain management agro-commodities as well as women engagement in agriculture. No significant improvement made in agriculture market infrastructure development and agro commodities storage facilities development. With the construction of the Padma Multipurpose Bridge, the opportunities of agro-commodities marketing export from Shibchar is expected to increase manifold. The upazila agriculture sector is far from climate sensitive technology dissemination and use of ICT in agriculture. Irrigation water use efficiency and management level of the upazila need to be harnessed in the light of the NAP 2013.

2.3 National Agricultural Extension Policy, 2012

The revised National Agricultural Extension Policy (NAEP, 2012), provides extension policy directions for transferring technologies to crop, fisheries and livestock sector development. The macro-economic scenario, agro ecology/bio-ecological zones and current issues in agricultural production, land ownership and tenancy, poor soil health status, decreasing agricultural land, irrigation water scarcity, lack of good agricultural practices, high demand of quality seeds/planting materials etc., livestock and fishery issues including emerging challenges and perspectives have been pointed out for strong consideration.

The mission of this NAEP is to provide efficient and effective decentralized demand responsive integrated extension services to all categories of farmers, producers and small & medium entrepreneur (SME) in agriculture through farmers group (FG) and their federations at union, upazila, district and national level, to enable them to optimize their use of resources, in order to promote sustainable agricultural, agri-business and socio-economic development.

The NAEP is built on nine (9) key principles:

1. Increasing production (horizontal and vertical) and productivity as a whole;
2. Cost effective efficient decentralized demand responsive extension services;
3. Targeting and mobilizing farmers group (FG) and their federations (FO);
4. Bottom-up planning and implementation;
5. Coordinated and integrated extension services through NAES;
6. Development of agri-business and contract farming for export promotion;
7. Adoption to climate change and development of specialized extension service for climatically distressed areas;
8. Broad based extension support (in-time input support and subsidies, credit, price enhancement etc.); and
9. Digitalized agricultural extension services (e-agriculture).

The goal of the National Agricultural Extension Policy is to: **“Encourage the various partners and agencies within the National Agricultural Extension System (NAES) to provide efficient and effective coordinated services which complement and**

reinforce each other, in an effort to increase the efficiency and productivity of agriculture in Bangladesh for ensuring food security and business development”.

To achieve the above goal in relation to different agriculture related policies of Bangladesh, the NAEP emphasis on:

- i) coordinated and integrated Extension services,
- ii) promotion of farmers’ group formation and their federation, iii) capacity building of farmers’ groups,
- iii) implementation of market led, demand driven, pluralistic and decentralized bottom-up extension system,
- iv) strengthening “One-Stop Service Center”,
- v) development of agribusiness and market linkage,
- vi) promoting e-agriculture,
- vii) strengthening Research-Extension- Farmers linkages, viii) strengthening urban agriculture,
- viii) strengthening PPP in agriculture,
- ix) Strengthening supply of quality seeds and other inputs
- x) emphasizing organic farming/ green farming,
- xi) mainstreaming women in agriculture,
- xii) emphasizing homestead gardening,
- xiii) thrust on farm mechanization,
- xiv) industry linkage for enhancing agro-based industries and xxi) Strengthening Monitoring and evaluation.

The revised National Agricultural Extension Policy 2012 provides policy directives for quicker transferences of modern technologies for crop, fisheries and livestock sub-sectors toward productivity enhancement and product quality and safety improvement. But unfortunately in Shibchar upazila public service providing agencies are unaware about the objectives of the policy. They are operating in the old fashion with the under developed and handicapped instruments and with less skilled manpower and or lack of adequate manpower, especially in fisheries and livestock sub-sectors. DAE is supposed to provide demand driven extension service, but how the technology demands of farmers are assessed is not clear. Census once conducted for need assessment of the farming community is now not in practice. Upazila agricultural extension program planning is not in practice now. Participatory extension program planning on the basis problem census is required to be executed to ensure decentralized and bottom-up planning.

2.4 The Ground Water Management Ordinance, 1985

The ground water management ordinance 1985 is an ordinance to manage the groundwater resources for agricultural production.

According to the Ordinance no tube well (means a deep tube well, shallow tube well, suction lift hand-pumped well or deep set hand pumped well used for irrigation or water supply) shall be installed in any place without a license granted by the Upazila Parishad. Upazila Parishad after necessary enquiry, through Upazila Irrigation Committee considering the aquifer condition of the soil, distance of the nearest existing tube well and the area likely to be benefited by he tube well and its impacts on water availability of other installed tube well will issue license. The Upazila Parishad

has been empowered to suspend or cancel the license on proper reasons. Implementation of ground order ordinance need to be accelerated in Shibchar Upazila.

2.5 National Water Policy, 1999

Government of Bangladesh has adopted the National Water Policy, 1999. that prioritized the importance of increasing irrigation water use efficiency through various measures including drainage-water recycling, rotational irrigation, adoption of water conserving crop technology, and conjunctive use of groundwater and surface water. The policy promised to continue support for private development of groundwater irrigation with simultaneous development of surface water irrigation where feasible. The policy expressed serious concerns regarding water pollution through residues of fertilizer and pesticides that are either leached to the groundwater or washed off the fields to rivers and lakes.

The NWP has 16 components, which describes policy measures to be undertaken to achieve the above objectives. These policy measures include: (1) river basin management, (2) planning and management of water resources, (3) water rights allocation, (4) public and private involvement, (5) public water investment, (6) water supply and sanitation, (7) water and agriculture, (8) water and industry (9) water, fisheries and wildlife, (10) water and navigation, (11) water hydropower and recreation, (12) water for environment, (13) water for preservation of haors, baors, and beels, (14) economic and financial management, (15) research and information management and (16) stakeholder participation.

The NWP, emphasizes, among others, three interrelated issues such as water and agriculture, water, fish and wild life, and water for preservation of haors, baors and beels. One of the notable policy directions in the NWP was to encourage private sector development of groundwater for irrigation and also to emphasize surface water augmentation.

2.6 Bangladesh Water Act, 2013

The recently published Water Act 2013 is based on the National Water Policy, and designed for integrated development, management, extraction, distribution, usage, protection and conservation of water resources in Bangladesh. In general, if one takes a critical look at the Act, the new law has provided the right framework for better management of water resources in the country. The Water Act 2013 is based on the National Water Policy, and designed for integrated development, management, extraction, usages, protection and conservation of water resources in Bangladesh.

In view of water resources protection and conservation, the Act adopted a timely decision to address the water needs in irrigation and urban areas in the context of available surface water, groundwater, and rainwater. The need for water resources management in the context of natural drainage pattern has also been correctly highlighted in the Act. Management of water resources within the territory of the country in rivers, creeks, reservoirs, flood flow zone, and wetlands has been assigned to the Executive Committee under the Ministry of Water Resources. In summary, the Act recognizes the significance for managing all forms of water resources in the context of natural flow of surface water and recharge of groundwater. The Act provides the legal framework for development, management, extraction, distribution,

usage, protection, and conservation of water resources. However, the Act falls short in making a commitment by the government to ensure the quality of water for various beneficial uses.

2.7 National Seed Policy, 1993 and Seed Rules, 1998, Seed Act of 1977, Seed Act (Amendment) 1997, Seed Act (Amendment) 2005

Quality seed is considered to be the basic input for increasing agricultural output and thereby achieving self-sufficiency in food production. Effectiveness of other inputs like, fertilizer and irrigation, depends largely on good seed. But use of improved seed is still very limited. Two major reasons behind this fact are:

- Production and distribution of quality seed is insufficient in the public sector as compared to its demand;
- Seed production in the private sector has not yet got the necessary support.

National Seed Policy provides policy directives to increase production of improved seed both in the public and private sectors and for making best quality seeds available to the farmers on timely basis, and at competitive price. The seed policy has also provisions, among other things, for liberalization of import of seed and seed processing machineries, strengthening of quality control and research system and maintaining a seed security arrangement. A major thrust of the seed policy has been on the institutional arrangement of the seed sector.

Government has already declared the National Seed Policy with the objective of promoting seed industry in the private sector. The basic objectives and strategies of the National Seed Policy (NSP) are of three types, i) strengthening BADC capacity, ii) allowing the private to produce seeds of approved varieties as well as develop new ones, and to iii) import seeds from abroad. For this purpose, importation procedures were simplified. The NSP and Seed Rules make a number of provisions that could guarantee quality of seeds either produced domestically or imported. First, any variety, whether imported or domestically developed, must be registering new seed variety and packaging seeds in labeled containers, must be registered. Finally, the Seed Certification Agency (SCA) must certify all varieties of seed.

2.8 National Water Management Plan, 2001

This framework plan aims to guide (but not prescribe), in an integrated and comprehensive manner, the actions of all concerned with development and managing water resources and water services.

The purpose of the NWMP is to operationalize directives given in the National Water Policy and in accordance with the government approved development strategy.

The objectives of the NWMP are, to contribute in a balanced fashion to the overall national goals of economic development, poverty alleviation, food security, public health and safety, decent standard living for the people and protection of the natural environment.

It is a rolling plan and updated in five years' interval providing a firm plan for the first five years, an indicative plan for the subsequent five years and perspective plan for the long term (25 years), all set in the context of what may happen at least 50 years ahead.

2.9 National Food Policy, 2006

The Ministry of Food (MoFood) has prepared the National Food Policy (NFP) with FAO support. The NFP clarifies three basic concepts: food security for all people, access to food depending on household income and food prices and health care, taking care of nutritious food and improvement of health care system. Given these basic concepts, the major objectives of the national food policy, which aims at ensuring dependable food security for all, are the following:

- a. Adequate and stable supply of safe and nutritious food at affordable prices;
- b. Increased physical, social and economic access and purchasing power of all people; and
- c. Adequate nutrition for all individuals, especially children and women.

The strategy for ensuring adequate and stable supply of safe and nutritious food at affordable prices- depends basically on improvement of domestic food grains production and food import. This will be realized through (i) improving agricultural research and extension, (ii) efficient use of water resources, (iii) availability of agricultural inputs and their efficient use, (iv) agricultural diversification and improved agricultural technology- promotion of non-food grain crops (vegetables, oilseeds, pulses and fruits), development of poultry, fisheries and livestock, increasing agricultural productivity and reducing post-harvest losses and disease/pest prevention. The second strategy is the development of efficient food market: (i) development of market infrastructure, (ii) encouragement to private sector by promoting private storage and movement of food items, liberal credit for food items and development and enforcement of quality standards and (iii) development and dissemination of early-warning and market information. The third strategy is the non- discretionary food market intervention for price stabilization, which is to be realized through (i) price incentives for domestic food production, (ii) public food grain stock and (iii) consumer price support.

The second objective- increased physical, social and economic access and purchasing power of all people- involves three sets of strategies. The first strategy is the transitory shock management, which includes (i) special measures for disaster mitigation for agriculture, (ii) emergency distribution from public stock and (iii) measures for increased supply through private trade and stock. The second strategy is the effective implementation of the targeted food-assistance programs. And the final strategy is the employment-generating income growth to pursue through (i) support to women in income generating activities, (ii) investment in employment enhancing technology, (iii) fiscal incentives for agro-based and rural industries, (iv) education skill and human resources development and (v) broad-based labor intensive growth promoting macro policy. The final objective- adequate nutrition for all individuals, especially children and women will be achieved through the following measures: (i) sufficient macro-nutrients and enhance nutrition for the vulnerable group, (ii) safe and quality food supply, (iii) safe drinking water and improved sanitation, (iv) balance diet containing sufficient micro- nutrient and (v) adequate health status.

2.10 The National Livestock Development Policy, 2007

NLDP, 2007 identifies ten critical policy areas. These are, Dairy Development and Meat Production, Poultry Development, Veterinary Services and Animal Health, Feeds and Fodder Management, Breeds Development, Hides and Skins; Marketing of Livestock Products; International Trade Management of this sector, Access to Credit and Insurance; and Institutional Development for Research and Extension. Besides, the ministry can ensure participation of women in the programmes/activities of this ministry as stated in the national policies formulated by it including the National Poultry Development Policy, 2008 and the Microcredit Disbursement Rules, 2011. The programmes/activities being carried out by this ministry include rearing of cattle and poultry, fish cultivation and processing and marketing. This ministry can play an enterprising role to ensure that the women get the due part of the benefit out of these activities.

2.11 National Fishery Policy (1998)

The policy aims to enhance fisheries production and improve socio-economic conditions for households where capture fishing is the main activity; to meet the demand for animal protein; to boost economic growth by exporting fish and fisheries products and finally to maintain an ecological balance. The policy also highlights the need to conserve fish habitats, especially in the development of water management infrastructure. Through the formulated policy, the Government of Bangladesh expressed its determination to prevent further drainage of standing water bodies for agricultural development, and to promote fisheries development in all water bodies.

2.12 National Land Use Policy (2001)

The National Land Use Policy was adopted by government in 2001, setting out guidelines for improved land-use and zoning regulations. The policy was issued by the Ministry of Land but the government has difficulties with implementation partly ascribed to the dispersion of land administration authority among many different ministries. To increase effectiveness and credibility of such reforms the government should focus on decentralized and concentrated services. The content of the National Land Use Policy is as follows:

- i) Stopping the high conversion rate of agricultural land to non- agricultural purposes;
- ii) Utilizing Agro-Ecological Zones (AEZs) to determine maximum land- use efficiency;
- iii) Adopting measures to discourage the conversion of agricultural land for urban or development purposes;
- iv) Improving the environmental sustainability of land-use practices.

2.13 PRSP- Agriculture and Rural Development

The PRSP places agriculture and rural development as the key driver of pro-poor growth strategy. Government's overriding policy is to create enabling environment and support the transformation of subsistence agriculture to a more diversified commercial agribusiness with significantly increased participation of private sector. For crop and non- crop sector growth, PRSP put emphasis on achieving productivity

and profitability gains, broad-based support to agriculture, diversification and commercialization of agricultural enterprises in the face of trade liberalization under globalization. PRSP also stressed on cross-cutting issues, i.e. agricultural research and technology generation, farmers' demand-led extension services, energizing agricultural marketing and agro-processing, land use and women in agriculture.

The most important contribution of PRSP exercise on agriculture is the formulation of a reasonably precise and workable policy matrix, which identifies 22 crucially important strategic goals, fixes up targets against these goals, charts actions already taken, sets future policy agenda and priorities and delineates responsibilities for the concerned ministries. The lead ministries established its ownership by playing active roles in fixing the policy priorities, which were then seeped through wide range of participation from the mainstream ministries, agencies, academia, NGO and civil society groups.

2.14 National IPM Policy, 2002

Crop pest control through chemical means has been the primary method in Bangladesh. After transfer of pesticide business to private sector in 1979, due to increased rice area, increase in cropping intensity and an increase in the area under high yielding varieties pesticide use increased to a dangerous level. Over dependence on chemical pesticides is not only expensive but also leads to negative environmental impacts, in addition to increased health hazards to both the grower and consumers of crops. There is a need for an alternative method rather than to rely solely on pesticides. Integrated Pest Management (IPM) has now been considered as the most appropriate one in this respect.

To enable farmers to grow healthy crops in an increased manner and thereby increase their income on a sustainable basis while improving the environment and community health Government of Bangladesh adopted IMP policy in the year 2002. The key components of the IPM policy are: i) maintaining ecological balance, ii) executing appropriate actions on pesticides, iii) operating an effective system for implementing the national IPM program, iv) developing human resources as the core of IPM, v) conducting research on IPM, and vi) maintaining Ecological Balance.

2.15 Actionable Policy Brief and Resource Implications (APB)

An Actionable Policy Brief (APB) was prepared in 2004 by the GoB. The APB is based on the overarching national goal, food security, which basically means sufficient cereal stock in the country. The APB is built on a solid conceptual framework, focused vision for the future, indicators of comparative advantages, competitive strength and profitability that will guide the development of each crop subsector, constraints to moving forward and key challenges that must be faced in achieving the overall objective of promoting food security for all in the country. The critical policy areas addressed in the APB include production and distribution of seed; production, import, pricing and marketing of fertilizers; land use, minor irrigation, mechanization, marketing and agribusiness, agricultural research and agricultural extension.

Seed: The APB team has identified the major constraints facing the seed sector and made several recommendations to overcome those constraints. The most important ones relate to facilitating quality seed development in private sector, training farmers

on quality seed production and preservation, strengthening seed certification, bolstering National Seed Board, rationalizing seed subsidy and ensuring level playing field for private sector seed developer.

Fertilizer: The APB emphasized three concepts- timely supply, adequate quantities and fair prices- as the key issues in the fertilizer policy. However, timely and adequate supply does not guarantee farmers to use proper doses unless they can buy fertilizers at fair prices at the time they need it. While privatization of fertilizer distribution since mid-1970's has generally improved availability of fertilizer, it has not necessarily succeeded in eliminating supply bottlenecks and ensuring fair prices of fertilizers at farm level. Fertilizer subsidy has also not guaranteed farmers the proportionate benefits, major share of subsidy benefits being grabbed by the fertilizer traders. The prominent constraints include depletion of soil nutrient, lack of awareness program, risk of crop failure, imbalanced use of fertilizer, deficiency in micro-nutrient and organic matter.

Land: The land use policy guideline was first introduced in the NAP prepared by the MoA in 1999. Then the Ministry of Land prepared a grand policy statement in 2001. APB recognizes the problems of implementing land policy, which arise from the fact that land administration falls into the domains of many ministries. The national land use policy recommends the following important measures: (i) halting the present alarming rate of conversion of agricultural land to non-agricultural purposes, (ii) preparing guidelines for maximum land utilization based on AEZ characteristics, (iii) discouraging acquisition of agricultural land for urbanization or for other development projects, and (iv) reducing environmental pollution and degradation of land, water and air and promoting environmentally friendly activities in agricultural development.

Minor irrigation: The APB team has identified factors constraining the development of minor irrigation and put forward several recommendations for removing those constraints. One of these recommendations includes reducing farmers' irrigation costs. There are two major ways to do this. First, subsidies may be provided on fuel as well as on the import of irrigation equipment. Second, supplying electricity to power-driven machines. But the policies have missed one important point that all farmers using irrigation facilities do not own the irrigation appliances. They used to buy water from pump owners under various payment system- cash, kind or hourly basis. This means that reduction of pumping costs through diesel or electricity subsidy, will not benefit the pump owners and not necessarily the farmers buying water because there is no way to make the water sellers to reduce water charges.

Mechanization: The APB identifies several constraints to desirable level of mechanization, which are (i) lack of knowledge and skill for efficient use, proper maintenance and repair of machinery at all levels of users, artisans and traders, (ii) absence of any public sector agricultural extension activity involving farm machinery or mechanization, (iii) poor quality of fuel and lubricating oil available in the village areas, (iv) Scarcity of proper spare parts, replaceable tools and accessories and adequate aftersales services, (v) poor quality of many imported as well as locally fabricated machines, (vi) low tariff on imported machines and high tariff on materials of fabrication (especially carbon steel), (vii) absence of product standards and quality certification (for both imported and locally made items) for helping traders and users to make informed choices, (viii) absence of adequate design and fabrication guidelines, technical facilities and credit sources for local manufacturers, and (ix) lack of

community threshing floors often impedes the use of threshing machines near the harvest areas especially in the haor regions of Bangladesh. The APB team makes several useful recommendations that are supposed to address these constraints. One important point missing from the report is that it does not recognize the importance of the growing market for power tiller services and thus it fails to pinpoint the implications of rationalizing import duty on power tiller accessories and development of infrastructure favoring power tiller growth.

Marketing and Agribusiness: The APB has discussed agribusiness constraints under eight groups- policy, institutional, infrastructural, human resources, information, quality Control. The APB team also makes valuable recommendations aimed at removing those constraints. These include establishment of an expert committee to review agribusiness status periodically, establishing agro-export processing zones, setting up a separate 'center for agricultural market research, intelligence and certification' by restructuring and renaming DAM, amendment of the agricultural markets produce regulation act of 1964, increased investment in market infrastructure, and arranging technical assistance and credit for improving preservation, packaging and transportation of agro-products, formulation of a comprehensive 'agribusiness policy' involving the private sector, establishment of an 'agribusiness development fund', and establishment of a 'market feeder road development and maintenance fund'.

Agricultural Research: The APB team analyzes agricultural research problems as the constraints faced by the NARS institutes and the NARS constraints are flagged as lack of quality human resource and funding, inflexible institutional and management system, and absence of decentralization of authority limiting freedom of research management. What the APB misses is a reflection on the new agenda for agricultural research in the changing national priorities towards pro-market technology generation and for protecting the interests of small farmers in the face of global competition. Also, the deplorable state of agricultural statistics and institutional obstacles to information flow, which hinder quality agricultural research, are not addressed at any great length.

Agricultural extension: In the backdrop of a long list of weaknesses of DAE, the APB team points out four major constraints/issues to be addressed for desirable development of agricultural extension system. These constraints/issues include blueprint agriculture and ecological problems, participatory technology development and extension, addressing equity and ecological problems, and group approach in extension. APB recommends formation of 'Specialized Agricultural Service Centers' (SASC) at the upazila level and one stop extension service at the union level', development of a comprehensive training program for the farmers, input dealers, seed producers and field technicians at the upazila level, adoption of community (village) or group based extension and training system to develop group farming, establishment of a permanent 'Advisory Committee on Agricultural Research and Extension', building soil-testing capacity at upazila level and strengthening SRDI capacity.

2.16 Bangladesh Climate Change Strategy and Action Plan (BCCSAP)

Bangladesh Climate Change Strategy and Action Plan 2009 is an updated and revised version of the Action Plan prepared in 2008. Bangladesh is one of the most vulnerable countries in the world due to climate change. The lives and livelihoods of millions people living in the climate hotspots are badly affecting due to climatic variability. Climate changes are a potential threat to human welfare and also challenge to

development. The Climate Strategy and Action Plan of Bangladesh is a part of overall development strategy of the country. The climate change constraints and opportunities are being integrated into the overall plan and programs involving all sectors and processes for economic and social development.

The plan is built on six pillars: i) food security, social protection and health; ii) comprehensive disaster management; iii) infrastructure development to protect the assets; iv) Research and knowledge management; v) Mitigation and low carbon development; and vi) capacity building and institutional strengthening.

2.17 7th Five-Year Plan

The 7th Five Year Plan has been conceived with other agenda to fix development strategy for agrarian economy in Bangladesh, bring dynamism in public-private investment, and diversify products to boost export. The SFYP emphasized in maintaining food security by raising productivity, profitability and higher growth in crop agriculture through diversified and high value crop production, more value addition, increasing efficiency in resource utilization and judicious use of agricultural inputs; promoting science-led technology system and disseminating improved technologies; **reducing loss of arable land**; minimizing yield gaps, increasing production, distribution and preservation of quality seeds; reducing output loss through technology based weather prediction. The plan emphasizes crop Zoning and land Use Planning as per productivity of land, availability of technologies and marketing facilities. For resource conservation and judicious use of inputs, the 7th FYP will give more focus on the Precision Agriculture (PA). To ensure economic use of water resources irrigation efficiency will be ascertained and modern water management technology will be promoted to enhance irrigation efficacy. During the plan period emphasis will be given to promote Good Agricultural Practices (GAP) suitable for Bangladesh agro-ecological and socio-economic conditions intensify crop production and to reduce dependency on animal, production cost, enhance productivity and profitability of land, labour and inputs. Farm mechanization will be promoted further to reduce harvest and post-harvest losses, production costs, and drudgery of farm workers and to ensure timely operation. 7th FYP will support SMEs in agro-processing to utilize seasonal surpluses in several agricultural commodities of perishable nature and to prevent postharvest losses and to enhance farmers' income. For efficient technology transfer and to ensure demand led research and extension the Regional Technical Committee (RTC) and District Technical Committee (DTC) and National Technical Co-ordination Committee (NTCC) will be revived during the plan period.

Livestock sector development strategy of 7th FYP is to extend DLS service with increasing resource allocations for providing better services in regulatory measures, quality assurance and control, monitoring function, food safety function, disease surveillance, while private sector, NGOs and CBOs (Community Based Organizations) would be encouraged to provide more services of the livestock. Govt. will reduce the demand and supply gap, supply chain based production, processing and marketing of milk and milk products; promoting cooperative dairy development and smallholder dairy farming integrated with crop and fish culture.

7th FYP will stress on increased production of fish through enhancing productivity, livelihoods security and equitable distribution of benefits side by side with the

conservation of potential fisheries resources and aquatic biodiversity of rivers, beel, *haor*, *baor*, flood plains and other water bodies. Priority areas of the sector will be to control of pollution of the rivers; prevent further deterioration of water logging, blockade of water-flows and shrinkage of water- bodies by infrastructures like embankment, roads, urban housing projects and industrialization

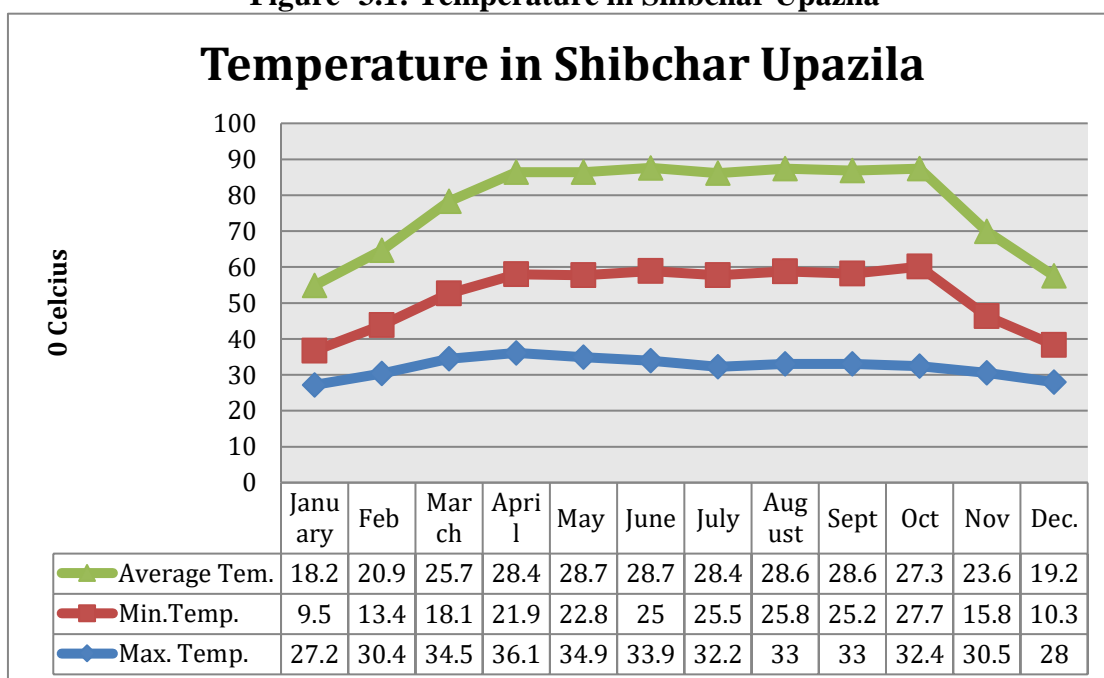
In the 7th FYP social forestry programs will be continue for expansion and strengthening of upazila nurseries, union level nurseries. An estimated 20,000 km. of strip plantations will be raised during the plan period. For the prevailing demand through social forestry, short/medium rotation fast growing tree species will be planted along the roads and embankments, and on marginal and fellow lands with active participation of local people and NGOs.

CHAPTER-3: BIOPHYSICAL RESOURCES

3.1 Climatic Condition

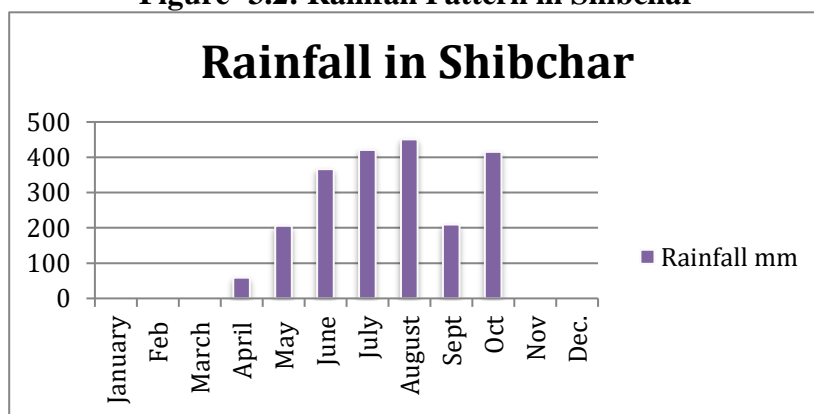
In Shibchar upazila there are three distinct seasons, rainy season (May to October), winter season (November to February) and summer season (March to April). The fig 3.1- and 3.2 reveal that the upazila has a tropical wet and dry climate characterized by monsoon high temperature, considerable humidity and rainfall. Average temperature is 25.5 °C. Hot season commences early in April and continues up to July maximum mean temperature observed (34°C) in April and minimum mean temperature recorded (12 °C) in January. Minimum temperature may fall up to 9° C in the month of January. Rainfall ranges from 4 mm in January to 363 mm in June with average annual rainfall of 2,014. Average rainfall in winter season is 65 mm. Monthly and yearly rainfall and temperature data of 30 years (1961 to 1999) received from Bangladesh Meteorological Department, Faridpur shown in figure 3.1

Figure- 3.1: Temperature in Shibchar Upazila



Source: Meteorological Department Faridpur

Figure- 3.2: Rainfall Pattern in Shibchar



Source: Meteorological Department Faridpur

3.2 Land

3.2.1 Land Type

In general, the upazila is dominated by medium highland (11870 ha) followed by medium lowland (12196 ha). Generally, favorable land conditions for varieties of production is indicated by higher percentage of medium high land. The distribution of agricultural land types by union is given in Table 3.1.

Table 3.1: Land Type

Union	HL ^a	MHL ^b	MLL ^c	LL ^d	VLL ^e	BL ^f	Total
1. Bandarkhola	25 (2%)	460 (28%)	1000 (62%)	99 (6%)	36 (2%)	0 (0%)	1620
2. Banshkandi	275 (14%)	950 (47%)	450 (22%)	200 (10%)	150 (7%)	0 (0%)	2025
3. Bayratala Daskhin	60 (8%)	340 (46%)	280 (38%)	55 (7%)	10 (1%)	0 (0%)	745
4. Bayratala Uttar	90 (9%)	530 (51%)	250 (24%)	150 (15%)	10 (1%)	0 (0%)	1030
5. Bhadrasan	0 (0%)	45 (6%)	350 (49%)	300 (42%)	25 (3%)	0 (0%)	720
6. Bhandari Kandi	115 (7%)	180 (11%)	1125 (70%)	100 (6%)	80 (5%)	0 (0%)	1600
7. Charjanjat	200 (4%)	1450 (32%)	420 (9%)	150 (3%)	55 (1%)	2280 (50%)	4555
8. Ditiyakhanda	50 (6%)	410 (47%)	348 (40%)	52 (6%)	15 (2%)	0 (0%)	875
9. Dattapara	420 (12%)	1020 (30%)	1180 (34%)	225 (7%)	415 (12%)	170 (5%)	3430
10. Kadirpur	75 (5%)	310 (20%)	1085 (70%)	55 (4%)	25 (2%)	10 (1%)	1560
11. Kanthal Bari	230 (9%)	1350 (54%)	630 (25%)	220 (9%)	50 (2%)	0 (0%)	2480
12. Ktubpur	21 (1%)	459 (29%)	1000 (63%)	80 (5%)	28 (2%)	0 (0%)	1588
13. Madaberer char	140 (8%)	630 (35%)	450 (25%)	280 (16%)	305 (17%)	0 (0%)	1805
14. Nilakhi	155 (8%)	670 (37%)	430 (24%)	270 (15%)	300 (16%)	0 (0%)	1825
15. Panch char	160	450	270	80	45	0	1005

^a High Land (HL), which is above the normal flood level

^b Medium High Land (MHL), Normally flooded up to about 90 cm (3 ft) deep.

^c Medium Lowland (ML), Normally flooded between 90-180 cm (3-6 ft) deep

^d Lowland (L), Normally flooded between 180-300 cm (6-10 ft).

^e Very Lowland (VL), Normally flooded deeper than 300 cm (> 10 ft).

^f Bottomland (BL), Depression sites in any land level class which remains wet throughout the year

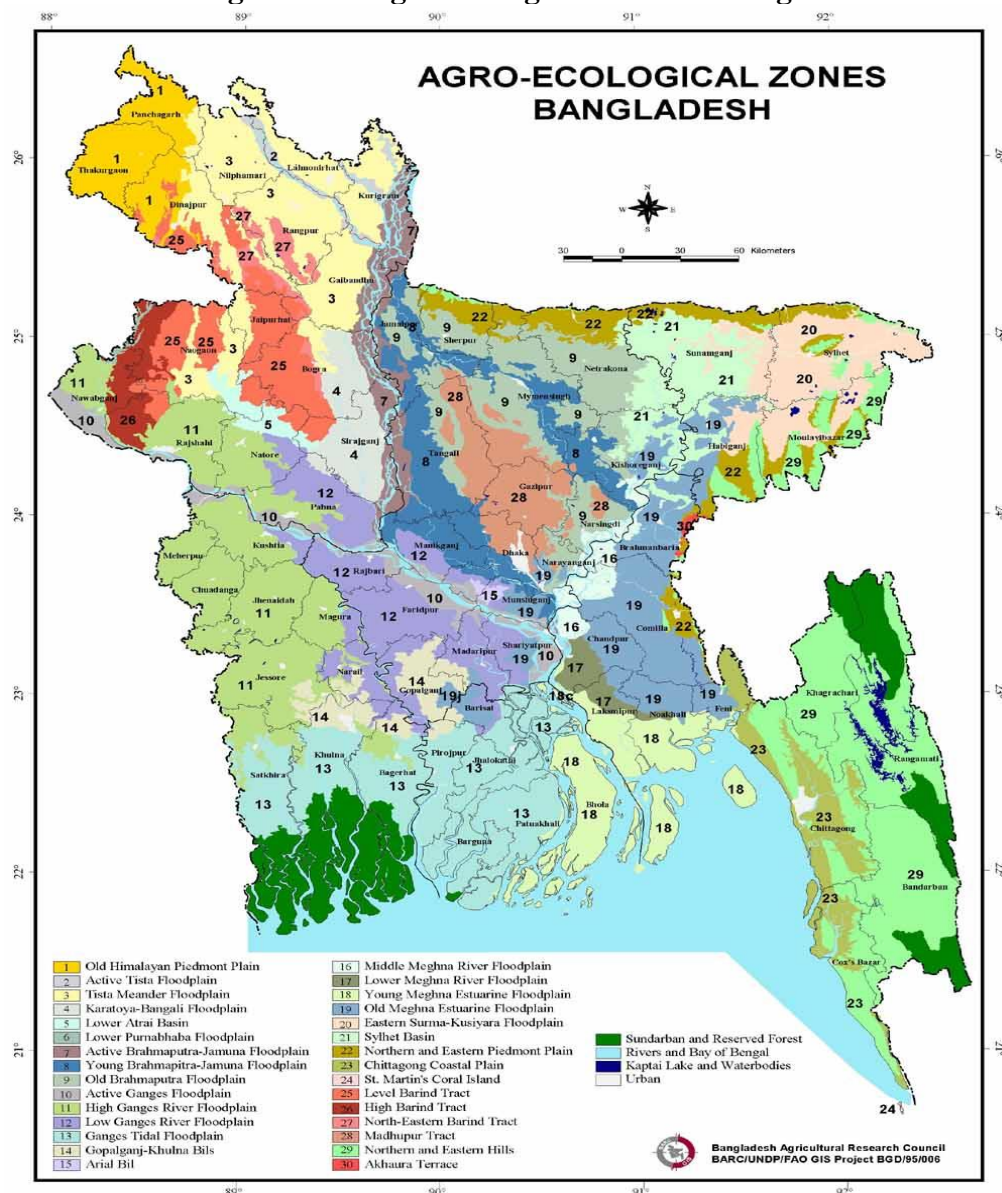
Union	HL ^a	MHL ^b	MLL ^c	LL ^d	VLL ^e	BL ^f	Total
	(16%)	(45%)	(27%)	(8%)	(4%)	(0%)	
16. Sannyasir Char	23 (1%)	626 (27%)	1028 (44%)	440 (19%)	235 (10%)	0 (0%)	2352
17. Shib Char	40 (6%)	300 (42%)	250 (35%)	100 (14%)	15 (2%)	1 (0%)	706
18. Umedpur	547 (27%)	950 (47%)	500 (25%)	43 (2%)	0 (0%)	0 (0%)	2040
19. Siruali	21 (1%)	540 (32%)	1000 (60%)	80 (5%)	28 (2%)	0 (0%)	1669
20 Municipality	30 (7%)	200 (44%)	150 (33%)	50 (11%)	20 (4%)	0 (0%)	450
Total	2677 (8%)	11870 (35%)	12196 (36%)	3029 (9%)	1847 (5%)	2461 (7%)	34080

Source: DAE, 2016

The upazila is covered by two Agro-ecological Zones (AEZs), Active Ganges Floodplain and Low Ganges river Floodplain. Active Ganges Floodplain occupies 7559 hectares of unstable alluvial char lands with irregular relief of broad and narrow ridges and depressions, interrupted by cut-off channels and active channels. Both the outline and relief of char formations are liable to change each flooding season due to bank erosion by shifting channels. Local difference in elevation are mainly 2-5 meter. Seasonal flooding is shallow on ridges and moderately deep in depressions. Depression sites and thick new silty deposits stay wet through the dry season.

Low Ganges River Floodplain covers 16041 hectares of land having meander floodplain landscape with greater relief differences between ridges and basins, deeply flooded by mainly rainwater (Floodplain, 2015). It has also higher proportion of the land, less deeply flooded and drains early enough in the dry season to be usable for dry land rabi crops. The region has a typical meander floodplain landscape of broad ridges and basins. It has somewhat irregular relief alongside rivers, crossing the region comprising broad and narrow ridges, inter-ridge depression and cut-off channels. Difference in elevation between ridge tops and basin centers are generally in the range of 3-5 meter. The highest part of the ridges stands above normal flood level, however, generally become wet during periods of heavy monsoon rainfall when the surrounding land is flooded and remain submerged for short period during exceptionally high floods. Adjoining middle parts of ridges are shallowly flooded at the peak of normal floods. The basins occupy greater portion of the landscape and are moderately to deeply flooded.

Figure- 3.3: Agro-Ecological Zones of Bangladesh



Source: BARC

3.2.2 Land Suitability for Crop Production

The land may be considered in its present condition or after improvement. The land suitability classification indicates the relative suitability of land for sustained production of common agricultural crops and other uses such as fisheries, forest, urban and commercial areas adapted to the existing physical and environmental condition. the soil may likely to change land capability classes. In that respect land suitability classification is an economic evaluation of land.

3.2.3 Crop Suitability

For crop suitability of a land its elevation, flooding depth, soil characteristics, as soil conditions, land type and topography, hazards like erosion, drought and socio-economic interventions etc. are used. On the basis of AEZ characteristics and “Land Suitability Assessment and Crop Zoning of Bangladesh” published by Bangladesh

Agricultural Research Council (BARC) in 2012 crop suitability of Shibchar has been prepared.

A crop suitability-rating table has been prepared using Upazila Land Use Report of SRDI, 2001. Four different categories of suitability have been used for land use: S₁ – highly suitable, S₂ – suitable, S₃- moderately suitable, S₄- not suitable. A land is considered suitable for a crop when it is either in category S₁ or in S₂ and moderately suitable or unsuitable for a crop when it lies under S₃ or S₄. Attributes used for the assessment of physical suitability are shown in table 3.2.

Table 3.2: Bio-Physical Attributes for Suitability of Agricultural Crops

Characteristics	Dry land Crops	T.aman	T.aus	Boro (HYV)
Land Type	HL to MHL	HL to MHL	HL to MLL	HL to MLL
Relief	Level	Level	Level	Level
Recession of Surface Water	Very early to early	Very early to late	Very early to late	Very early to very late
Drainage	Well to poor	Moderately well to poor	Moderately well to poor	Moderately well to poor
Soil Texture	Silty loam- Silty Clay	Silty Clay to Clay	Silty Clay to Clay	Silty Clay to Clay
Top Soil consistency	Friable	Firm to friable	Firm to friable	Firm to friable
Soil Moisture	Moderate to high	Moderate to high	Moderate to high	Moderate to high
Soil PH	4.5 - 8.4	4.5 - 8.4	4.5 - 8.4	4.5 - 8.4

Source: Upazila Land Use Report, SRDI, 2001.

On the basis of the above characteristics agricultural land use of all upazilas of Shibchar have been done (table 3.3).

Table 3.3: Land Suitability of Shibchar by Union

Union	Area (ha)	Land Type %	Soil P ^H	Top Soil Texture	Land Suitability
Bandarkhola	1400	HL-12,MHL-22,MLL-36,LL-18,VLL-12	5.7-7.5	Loam to Silty Loam	Mostly S1 and S2
Banshkandi	1938	MHL-11,MLL-22,LL-33,VLL-34	6.0-6.5	Loam to Clay Loam	Mostly S1 and S2
Bayratala Dakshin	934	HL-11,MHL-62,MLL-25,LL-2	6.2-7.0	Silty Loam to Loam	Mostly S1 and S2
Bayratala Uttar	1258	HL-5,MHL-22,MLL-49,LL-19,VLL-5	5.7-6.5	Clay Loam to Loam	Mostly S1 and S2
Bhadrasan	960	HL-7,MHL-49,MLL-49,LL-19,VLL-5	5.0-6.0	Clay Loam to Loam	Mostly S1 and S2
Bhandarikandi	1359	HL-14,MHL-24,MLL-30,LL-17,VLL-115	5.7-6.5	Clay Loam to Loam	Mostly S1 and S2
Char Janajat	3195	HL-2,MHL-15,MLL-24,LL-47,VLL-12	6.0-7.0	Silty Loam to Sandy Loam	Mostly S1 and S2
Datta Para	2466	HL-18,MHL-34,MLL-36,LL-5,VLL-7	6.0-7.0	Clay Loam to Loam	Mostly S1 and S2
Ditiya Khanda	785	HL-7,MHL-45,MLL-38,LL-10	6.2-7.0	Clay Loam to Loam	Mostly S1 and S2
Kadirpur	1996	HL-4,MHL-21,MLL-65,LL-7,VLL-3	5.7-6.0	Loam to Clay Loam	Mostly S1 and S2
Kanthalbari	3716	HL-7,MHL-47,MLL-	6.3-7.0	Loam to Clay Loam	Mostly S1 and S2

		27,LL-13,VLL-6			
Kutubpur	1528	MHL-59,MLL-39,LL-2	5.7-7.0	Silty Loam to Sandy Loam	Mostly S1 and S2
Matbarer Char	2126	HL-28,MHL-29,MLL-23,LL-13,VLL-7	6.2-7.0	Loam to Silty Loam	Mostly S1 and S2
Nilakhi	1509	HL-24,MHL-15,MLL-27,LL-14,VLL-20	5.7-6.0	Sandy Loam to Sand	Mostly S1 and S2
Panch Char	1393	HL-11,MHL-50,MLL-31,LL-6,VLL-2	5.7-7.0	Loam to Sandy Loam	Mostly S1 and S2
Sannyasir Char	1859	HL-4,MHL-76,MLL-16,LL-4	6.0-6.5	Silty Loam to Loam	Mostly S1 and S2
Shibchar	534	HL-20,MHL-61,MLL-8,LL-8,VLL-3	5.7-7.0	Loam to Sandy Loam	Mostly S1 and S2
Siruail	1578	HL-47,MHL-14,MLL-25,LL-12,VLL-2	6.5-7.0	Silty Loam to Clay Loam	Mostly S1 and S2
Umedpur	1966	HL-39,MHL-16,MLL-20,LL-23,VLL-2	6.5-7.0	Sandy Loam to Loam	Mostly S1 and S2
Shibchar Municipality	803	HL-4,MHL-83,MLL-10,LL-3	6.2-7.0	Loam to Silty Loam	Mostly S1 and S2

* Land Type^g

**Land Suitability Classification^h

Source: SRDI, 2001

3.2.4 Land Utilization Pattern

Table 3.4 reveals that, out of the total area 33469 ha only 74 ha (<1%) is forest coverage i.e under social forestry, 2500 ha (7%) water area, 500 ha (1%) is urban area, 6388 ha (19%) occupied by rural settlement and 14007 (72%) ha is cultivable area. Out of the total cultivable area 23264 ha (97%) is under crop cultivation and only 530 ha (2%) is used for non-agricultural purposes.

Table 3.4: Land Utilization Pattern by Union

Union	Total Area (ha)	Forest area (ha)	Water area (ha)	Urban area (ha)	Rural settlement (ha)	Cultivable area (ha)	Cultivated area (ha)	Permanent fallow (ha)	Area used for other purposes (ha)
Bandarkhola	1400	0	150	15	200	1035	1000	10	25
Bashkandi	1938	0	150	20	500	1268	1240	8	20
Bayratala Dakshin	934	0	100	10	250	574	565	4	5
Bayratala uttar	1258	0	100	10	200	948	940	1	7
Bhadrasan	960	0	100	10	200	650	640	5	5
Bandarikandi	1360	0	50	10	200	1100	1100	0	0
Char Janajat	3195	10	1000	60	300	1825	1750	25	50
Ditiakhanda	785	0	55	20	200	510	500	5	5
Datta Para	2466	10	100	60	500	1796	1790	2	4
Kadirpur	1996	10	50	10	250	1676	1650	6	20

^g HL- High Land, MHL-Medium High Land, MLL- Medium Low Land, LL-Low Land, VLL-Very Low Land

^h S₁- Highly Suitable, S₂-Suitable, S₃- Moderately Suitable, S₄- Not Suitable

Union	Total Area (ha)	Forest area (ha)	Water area (ha)	Urban area (ha)	Rural settlement (ha)	Cultivable area (ha)	Cultivated area (ha)	Permanent fallow (ha)	Area used for other purposes (ha)
Kanthalbari	3716	10	50	10	600	3046	3000	15	31
Kutubpur	1528	0	50	25	300	1153	1100	3	50
Mathbarer Char	2126	10	100	26	350	1640	1575	15	50
Nilakhi	1509	10	100	20	350	1029	1009	10	10
Pach Char	1393	18	100	20	300	955	940	5	10
Sannyasir Char	1859	2	100	35	358	1364	1350	4	10
Shib Char	534	0	50	20	100	364	360	0	4
Umedpur	1966	1	50	20	250	1645	1625	5	15
Siruail	1578	0	50	20	300	1208	1180	5	23
Shibchar Municipality	803	5	5	115	450	228	210	0	18
Total	33304	86	2510	536	6158	24014	23524	128	362

Source: DAE, Shibchar, 2016 & BBS, 2011

At individual level maximum 0.53 ha and minimum 0.06 ha of land are used for homestead. Area under perennial plants are maximum 2.94 ha and minimum 0.01 ha. individual pond /water area is maximum .81 ha and minimum 0.01 ha.

Table 3.5: Individual Land Utilization Pattern

Purpose	Land use pattern by individual household (ha)		
	Minimum	Maximum	Average
Homestead	0	0.53	0.06
Field crop	0	8.42	0.6
Perennial plants	0	2.94	0.01
Cultivable waste	0	1.34	0.02
Pond/ Water bodies	0	0.81	0.01

Source: Household Survey, 2016

3.2.5 Growth and Decline of Cropland During Last 10 Years

Due to urbanization and rural settlement and other infrastructure net cropped area declined over the last 10 years. But necessity knows no bounds. To combat the situation farmers are intensifying crop land use by producing more than one crops in a year. Therefore, the total cropped increased during the last decade (Table 3.6).

Table 3.6: Growth/ Decline of Cultivated Land in Shibchar

Union	Total Cultivated Area (ha)			
	2005-06	2015-16	Growth/Decline (ha)	Growth/Decline (%)
Bandarkhola	1078	1036	-42	4 % Declined
Bashkandi	1442	1434	-8	1 % Declined
Bayratala Dakshin	698	691	-7	1 % Declined

Union	Total Cultivated Area (ha)			
	2005-06	2015-16	Growth/Decline (ha)	Growth/Decline (%)
Bayratala uttar	980	931	-49	5 % Declined
Bhadrasan	750	710	-40	5 % Declined
Bandarikandi	1020	1006	-14	1 % Declined
Char Janajat	2332	2314	-18	1 % Declined
Ditiakhanda	843	825	-18	2 % Declined
Datta Para	1582	1545	-37	2 % Declined
Kadirpur	1456	1407	-49	3 % Declined
Kanthalbari	2638	2605	-33	1 % Declined
Kutubpur	1121	1111	-10	1 % Declined
Mathbarer Char	1417	1403	-14	1 % Declined
Nilakhi	1127	1117	-10	1 % Declined
Pach Char	1041	1031	-10	1 % Declined
Sannyasir Char	1319	1306	-13	1 % Declined
Shib Char	338	385	47	14 % Growth
Umedpur	1126	1115	-11	1 % Declined
Siruaail	1315	1302	-13	1 % Declined
Shibchar Muni.	584	626	42	7 % Growth
Total	25257	23900	-1357	5 % Declined

Source: DAE, Shibchar, 2016

3.3 Soil

3.3.1 Soil Type

The soils of the upazila are complex mixture of calcareous sandy and clay alluvium, with some shallowly developed brown loamy soils on ridges and dark grey clay in depressions on older alluvial areas. The proportions of sandy, silty and clay alluvium vary from place to place and from year to year. Organic matter contents are low, especially in sands and the soil reaction is moderately alkaline. Seven general soil types occur in the region, but only three cover significant areas. Low Ganges River Floodplain has predominantly developed calcareous soils. It has a high proportion of soils with a clay topsoil, so runoff is rapid during heavy pre-monsoon and early monsoon rainfall, causing water levels to rise rapidly in basin centers. After external flood levels fall, drainage is rapid from ridge sites, but basin centers stay wet for part or all of the dry season; the extent varies from year to year. The general soil pattern is olive-brown silt loams and silty clay loams on the highest parts of the floodplain ridges and dark grey silty clay loams to heavy loams to heavy clays on lower sites. Basin clays are relatively more extensive in this region. Brown and dark grey ridge soils are calcareous and moderately alkaline throughout. Basin clays usually have a strongly or very strongly acid cultivated layer overlying a slightly acid to neutral subsoil. Some heavy clay in basin centers remains strongly or very strongly acid. Organic matter content in the cultivated layer range from less than about 1.5 percent in

brown ridge soils to 2-5 percent in darkest grey soils and more than 5 percent in some basin centers soils which stay wet for most or all of the dry season.

3.3.2 Soil Nutrient Status

The soil nutrient condition in Shibchar is moderate. Major plant nutrients- Nitrogen, phosphorus content is low to very low when potassium content is moderate. Micronutrient content is high except Zn, which is low in the soil (Table.3.7)

Table 3.7: Soil Nutrient Status of Shibchar Upazila

Land Type	Soil Texture	Cultivation Type	Nutrient Status										
			Ca	Mg	K ₂ O	N	P ₂ O ₅	S	B	Cu	Fe	Mn	Zn
HL	Loamy	Upland/ Wetland	VH-H	VH-H	M	L	L	L	L	VH	VH	VH	L
MHL	Loam/Clay Loam	Upland/ Wetland	VH-H	VH-H	M	L	L	L	L	VH	VH	VH	L
MHL	Loam/Clay Loam	Upland/ Wetland	VH	VH	M	VL-L	VL-L	L	VL	VH	VH	VH	L

Note- VH- Very High, H- High, M- Medium, L- Low, VL- Very Low

Source: SRDI, 2001

CHAPTER-4: AGRICULTURAL PRODUCTION AND MARKETING SYSTEMS

4.1 Crop Agriculture

About 72 percent of the land of the upazila area is occupied by crop and intensively used for cultivation (DAE, Shibchar, 2016). Due to dominance of medium low land, cropping intensity during summer season is comparatively less than winter. During winter, the crop fields are covered by multiple crops and give a refreshing view. Well-grown fruits are date palm, palm, coconut, areca nut, mango, jackfruit, guava and banana etc. Date palm in agricultural land is a well-known pattern. Tree farming is found in the raised border of land. Field crops and date palm collectively yields a bumper crops as well harnessed cash-income. It is a friendly agroforestry land use model considered as a best tree farming practice in the country. The area is suitable for betel vine cultivation. Out of the total 23264 ha. net cropped area, 18 percent is single cropped, 66 percent double cropped, and 17 percent triple cropped. Land of the upazila is moderately fertile and cropping intensity is 199 %. The area is favorable and suitable for betel vine cultivation and other winter crops.

4.1.1 Farming Category

In Shibchar upazila small and marginal farmers (Marginal 42% and Small 31%) dominate the farming community. About 13 percent farmers are landless. About 14 percent farmers (medium-11% and Large -3%) are economically solvent. Out of 55856 farm families, 17175 (31 percent) are tenant farmers (DAE, Shibchar, 2016). Small and tenant farmers are resource poor and invest less in the farming and are not able to harvest potential yield of the crops and crop varieties. Due to poverty the farming practices are mostly subsistence in nature and produce minimum marketable commodities.

Table 4.1: Farm Category of Shibchar by Union

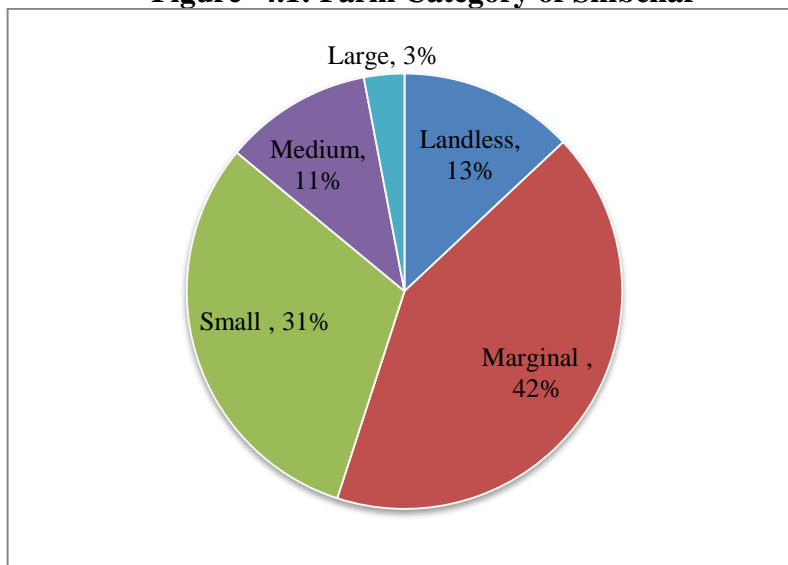
Union	Category of Farm Family (%)					Total
	Land Less	Marginal	Small	Medium	Large	
Bandarkhola	250 (12%)	400 (20%)	800 (39%)	500 (24%)	100 (5%)	2050
Banshkandi	450 (20%)	1050 (47%)	500 (22%)	200 (9%)	50 (2%)	2250
BayratalaDakshin	200 (10%)	450 (22%)	1050 (52%)	300 (15%)	25 (1%)	2025
Bayratala Uttar	290 (12%)	1350 (55%)	480 (20%)	300 (12%)	40 (2%)	2460
Bhadrasan	297 (12%)	1693 (69%)	236 (10%)	201 (8%)	19 (1%)	2446
Bhandarikandi	190 (7%)	1670 (59%)	675 (24%)	260 (9%)	35 (1%)	2830
Char Janajat	350 (19%)	850 (47%)	400 (22%)	175 (10%)	50 (3%)	1825
Datta Para	1200 (15%)	3000 (37%)	2500 (30%)	700 (9%)	800 (10%)	8200
Ditiyakhanda	160 (8%)	745 (37%)	835 (42%)	230 (11%)	35 (2%)	2005
Kadirpur	330	1840	640	365	50	3225

Union	Category of Farm Family (%)					Total
	Land Less	Marginal	Small	Medium	Large	
	(10%)	(57%)	(20%)	(11%)	(2%)	
Kanthalbari	410 (15%)	1050 (38%)	748 (27%)	450 (16%)	92 (3%)	2750
Kutubpur	627 (19%)	1320 (41%)	877 (27%)	415 (13%)	15 (<1%)	3254
Matbarer Char	380 (9%)	1860 (45%)	1420 (34%)	440 (11%)	50 (1%)	4150
Nilakhi	100 (6%)	500 (29%)	800 (47%)	150 (9%)	150 (9%)	1700
Panch Char	510 (14%)	1650 (44%)	1215 (33%)	310 (8%)	25 (1%)	3710
Sannyasir Char	80 (6%)	842 (64%)	254 (19%)	118 (9%)	26 (2%)	1320
Shibchar	50 (7%)	350 (50%)	220 (31%)	76 (11%)	10 (1%)	706
Siruaill	627 (19%)	1320 (39%)	877 (26%)	415 (12%)	111 (3%)	3350
Umedpur	670 (16%)	1350 (31%)	2020 (47%)	235 (5%)	25 (1%)	4300
Shibchar Municipality	200 (15%)	300 (23%)	500 (38%)	200 (15%)	100 (8%)	1300
Total	7371 (13%)	23590 (42%)	17047 (31%)	6040 (11%)	1808 (3%)	55856

Source: DAE, 2016

As of the Population and Housing Census 2011, Shibchar has a population of 31,8220 of which 156508 are males and 161712 are females. with population density 956 per km². Males constitute are 49 percent of the population, and females 51 percent. The sex ratio is Male: Female= 0.49:1. This Upazila's eighteen up population is 143975. The table 1.1 shows that about 73 percent of the population aged 7 or above are engaged in agriculture out of which and 70 percent male and only 3 percent female.

Figure- 4.1: Farm Category of Shibchar



Source: DAE, 2016

Table 4.2: Population Engaged in Agriculture

Union/ Municipality	HHs	Pop ⁿ	Pop ⁿ aged 7 years and above			
			Total Pop ⁿ	Pop ⁿ engaged in agriculture		
				Male	Female	Total
Municipality	5527	24154	1625	870	234	1104
Bandarkhola	2094	9129	1601	1207	55	1262
Banshkandi	4249	19436	2315	1907	36	1943
Bayaratola Dakshin	1864	8995	1147	907	106	1013
Bayratola Uttar	2693	12243	2106	1640	214	1854
Bhadrasan	2409	10339	1353	959	9	968
Bhandarkandi	2376	10178	1248	1142	23	1165
Char Janajat	3557	17234	2740	2366	70	2436
Dattpara	5242	24343	3091	2273	53	2326
Ditiyakandi	2513	11152	1235	941	42	983
Kadirpur	3172	14920	2010	1618	152	1770
Kanthalbari	4136	19612	2940	2386	52	2438
Kutubpur	3802	17373	2644	2160	31	2191
Matbarerchar	5411	26058	6699	2185	32	2217
Nilakhi	2798	12770	1690	1300	14	1314
Panchchar	3995	19252	1947	1038	28	1066
Sannyasir Char	3836	16035	2237	1870	26	1896
Shibchar	1128	5382	904	542	256	798
Siruail	3662	15936	2399	1775	23	1798
Umedpur	5159	23679	2676	1904	42	1946
Total	69623	318220	44607	30990	1498	32488

Source: Population & Housing Census-2011, BBS

4.1.2 Land Ownership

Farmers land ownership pattern as the household survey revealed that average farmers have only one hectare of land with maximum 8.52 ha and average 0.53 ha. when maximum leased in land is 1.6 ha. and average leased area is 0.12 ha. Mortgage land area is maximum 4.00 ha and average 0.07 ha. The ownership pattern indicates that most of the farmers are poor and their large farmers are absentee who lease out or mortgage their cultivable land to landless or marginal and small farmers.

Table 4.3: Land Ownership Pattern

Ownership	Land Area (ha)		
	Min	Max	Average
Own land	0.00	8.52	0.53
Leased in land	0.00	1.60	0.12
Mortgage in land	0.00	4.05	0.07
Total	0.00	8.52	0.72

Source: Population & Housing Census-2011, BBS

4.1.3 Major Crops Grown

Agro-climatic condition of Shibchar upazila favors the production of a number of crops, most of those are high value and increasing demand in the local and international market. Crops grown in the upazila with estimated area are shown in the Table 4.4.

Rice: Rice is a primary crop and a staple food of this area. Major rice grown in aman season. Boro rice cultivation expanding with the increase of irrigation facilities in the upazila. Productivity of rice increased due to technological breakthrough. At present rice grown in about 9537 ha of land and covers 20 percent of the cropped area.

Jute: Jute is the main cash crops of this upazila. It is an eco-friendly fiber crop and increase soil fertility. Jute grown in about 15895 ha. of land and covers about 33 percent of total cropped area. Despite relative decline in jute area and production due to defective marketing system, potential still exists for the fibre to increase its contribution to the economy through productivity enhancement by increasing availability of quality seeds and accelerated extension services and providing credit support.

Vegetables: Vegetables grown both in winter and summer season are next important crops of the upazila. A good number of vegetables like brinjal, green chilli, are grown here all the year round. Table 4.3 shows that vegetables grown in 1284 ha of land of which winter vegetables coverage is 526 ha and summer and year round vegetables grown in 858 ha of land. Most of the rural households grow vegetables in the homestead areas. But due to dominance of medium low and low land vegetables covers only 3 percent of total cropped area. Immense potentials exists to increase area and production of summer vegetables in the upazila by introducing modern techniques.

Pulses and oil crops: Riverine floodplain dominant in the upazila with medium low and low land accompanied by calcareous soil made it highly suitable for pulses and oil crops cultivation in the winter season. At present pulses and oil crops grown respectively in about 1900 ha. and 3000 ha. of land. These

crops occupy about 12 percent of the total cropped area. Introduction of modern varieties with improved cultural practices can increase pulses and oil crops production and productivity.

Photograph 4.1: Mustard Crop Field in Panch Char Union



Spices: Spices are the important rabi crops grown in Shibchar upazila. Spices grown in about 8700 ha of land and occupy about 18 percent cropped area of the upazila. Spices have bright prospect of growing in the upazila with modern techniques through organized farming approaches.

Tuber Crops: Potatoes and sweet potato are important tuber crops in the upazila. Area under tuber crops is about 4845 ha. and occupying about 10 percent of the cropped area. Vitamin rich Orange Fleshed Sweet Potato if introduced through project support could contribute in reducing nutrient deficiency and food security of the rural community.

Table 4.4: Area (Percentage) under Major Crops in Shibchar

Union	Rice (ha)	Wheat (ha)	Maize (ha)	Pulse (ha)	Oil Crops (ha)	Tuber Crops (ha)	Species (ha)	W. Veg (ha)	S. Veg (ha)	Fruits (ha)	Jute (ha)	S. Cane (ha)
Bandarkhola	18.78	3.90	0.24	10.49	10.29	16.24	15.02	3.66	2.44	1.37	17.07	0.49
Banshkandi	24.21	1.59	0.00	2.18	8.81	2.62	15.67	1.59	2.46	0.40	39.68	0.79
Bayratala Dakshin	12.51	3.08	0.44	11.45	4.93	11.10	17.62	1.76	2.11	0.62	34.36	0.00
Bayratala Uttar	18.72	1.60	0.27	10.70	5.35	18.72	12.57	2.67	1.60	0.53	26.74	0.53
Bhadrasan	16.54	3.15	0.39	6.30	7.87	7.87	13.78	1.97	2.36	0.79	37.80	1.18
Bhandarikandi	10.68	3.41	0.09	5.18	10.64	7.64	19.55	1.59	3.27	1.27	36.36	0.32
Char Janajat	36.34	1.41	1.41	7.61	4.23	7.04	14.08	2.82	1.83	0.70	22.54	0.00
Datta Para	36.46	5.21	0.00	7.81	5.21	7.81	7.81	4.17	3.13	1.04	20.83	0.52
Ditiya Khanda	32.07	2.92	0.73	7.29	7.29	7.29	8.75	4.96	4.37	0.73	23.32	0.29
Kadirpur	16.92	3.08	0.09	4.00	4.92	5.38	21.54	1.54	1.54	0.37	40.00	0.62
Kanthalbari	25.86	2.59	0.86	10.34	10.34	8.62	8.62	4.31	3.45	0.52	24.14	0.34
Kutubpur	18.18	0.45	0.00	2.27	2.27	4.55	25.91	0.45	1.36	0.55	43.64	0.36
Matbarer Char	29.92	1.57	0.06	11.02	9.45	14.17	12.60	0.79	0.98	0.54	17.32	1.57
Nilakhi	26.90	0.81	0.00	13.45	5.38	12.10	8.07	1.34	1.34	0.48	29.59	0.54
Panch Char	22.50	1.25	0.00	10.00	5.00	17.50	10.00	1.25	1.50	0.50	30.00	0.50
Sannyasir Char	14.89	0.85	0.21	6.17	6.81	4.26	21.70	0.64	1.28	0.43	42.55	0.21
Shibchar	36.76	1.47	0.74	7.35	7.35	8.82	7.35	2.94	3.68	1.47	22.06	0.00
Siruaill	16.00	1.60	0.00	4.80	4.80	3.20	28.80	4.80	3.20	0.32	32.00	0.48
Umedpur	21.17	1.82	0.04	5.84	4.38	8.39	21.90	1.82	0.91	1.97	31.02	0.73
Shibchar Municipality	23.81	1.19	1.19	5.95	4.76	11.90	11.90	7.14	5.95	2.38	23.81	0.00

Source: DAE, Shibchar, 2016

4.1.3 Cropping Pattern

Consultation with DAE field staff and local elite farmers disclosed the land based cropping pattern practices of the farmers of Shibchar upazila. During kharif-I jute dominate the cropped area when in Kharif-II aman rice is the main crop. Varieties of rabi crops like spices, pulses and winter vegetables grown in the upazila (Table 4.5). Improved cropping pattern including high value dry land crops like pulses, oil crops, spices need to be introduced through demonstration in the farmers' fields.

Table 4.5 Existing Cropping Pattern

Land type	Existing Pattern	Area
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	Kharif-I [□]	Kharif-II ^Φ	Rabi [#]	(ha)
High Land	Jute	Fellow	Onion	1500
	Jute	Black gram	Mustard	500
	Jute	T.aman	Garlic	300
	Vegetables	Vegetables	Vegetables	377
Medium High Land	Jute	T.aman	Lentil	3000
	Jute	T.aman	Garlic	1500
	B. aus	Fellow	Groundnut	2000
	Jute	B. aman	Coriander	4000
	Jute	T. aman	Wheat	1370
Medium low Land	Jute	Fallow	Black cumin/Spices	4300
	Jute	Fallow	Grass pea	3200
	Fellow	T. aman	Coriander/spices	4696
Low Land	Fellow	Boro (HYV)	Fallow	2100
	Fellow	Boro (Local)	Fallow	929

Source: DAE, 2016

4.1.4 Cropping Intensity

Multiple crops produced by the enthusiastic farmers in Shibchar upazila. Keeping pace with the market demand and family needs farmers are producing various crops round the year.

At the same time, the pressure of population on land and other natural resources along with river erosion, infrastructure and unplanned establishment is a major factor for changing land-use patterns rapidly which has adverse effect upon upazila's agricultural land. Consultation workshop with the field officials of the Department of Agricultural Extension cropping intensity has been calculated. Present cropping intensity is around 198 percent. Highest intensity (234 %) recorded in Umedpur and lowest (174 %) in Sannyasir Char union (Table 4.6).

Table 4.6: Cropping Intensity

Union	Net Cropped Area (ha)	Single Cropped		Double Cropped		Triple Cropped		Intensity
		Area (ha)	(%)	Area (ha)	(%)	Area (ha)	(%)	
Bandarkhola	1000	250	25	450	45	300	30	205
Banshkandi	1240	200	16	800	65	240	19	203
Bayratala Daskshin	565	55	10	450	80	60	11	201
Bayratala Uttar	940	150	16	650	69	140	15	199

Kharif-I: It is the transition period between summer and winter. It starts from 1st week of March and ends in last week of May.

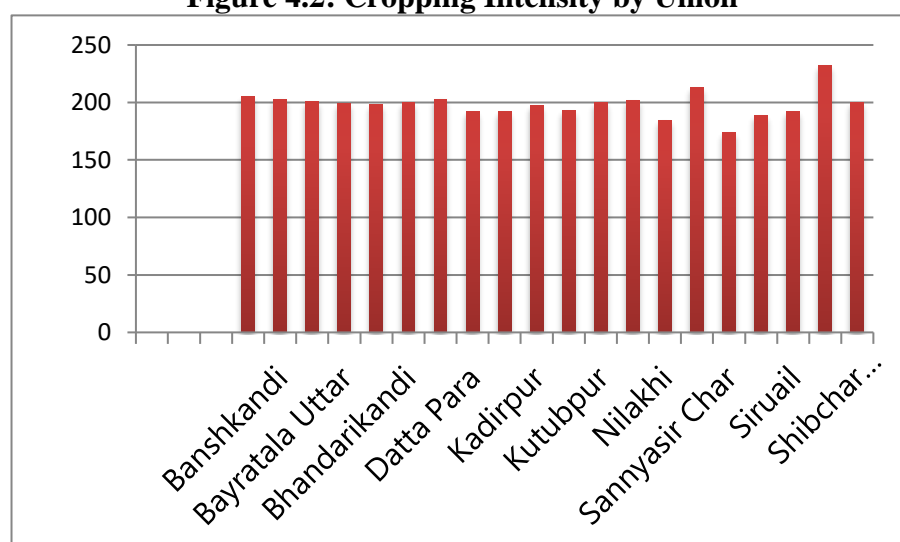
Kharif -II: The season starts from 1st week of June and ends in last week of October.

Rabi: Starts at the end of the humid period and extends up to the pre-kharif season (Nov.- Feb). The mean length of the Rabi growing period ranges from 100-120 days in the extreme west to 140-150 days in the Northeast of Bangladesh

Union	Net Crop ped Area (ha)	Single Cropped		Double Cropped		Triple Cropped		Intensity
		Area (ha)	(%)	Area (ha)	(%)	Area (ha)	(%)	
Bhadrasan	640	40	6	570	89	30	5	198
Bhandarikandi	1100	100	9	900	82	100	9	200
Char Janajat	1750	400	23	900	51	450	26	203
Datta Para	500	100	20	340	68	60	12	192
Ditiyakhanda	1790	400	22	1140	64	250	14	192
Kadirpur	1650	200	12	1300	79	150	9	197
Kanthalbari	3000	700	23	1800	60	500	17	193
Kutubpur	1100	100	9	900	82	100	9	200
Matbarer Char	1575	350	22	850	54	375	24	202
Nilakhi	1009	259	26	650	64	100	10	184
Panch Char	940	60	6	700	74	180	19	213
Sannyasir Char	1350	450	33	800	59	100	7	174
Shibchar	360	100	28	200	56	60	17	189
Siruil	1625	250	15	1250	77	125	8	192
Umedpur	1180	150	13	500	42	530	45	232
Shibchar Municipality	210	50	24	110	52	50	24	200
Total	23524	4364	19	15260	65	3900	17	198

Source: Consultation Workshop with DAE, Shibchar

Figure 4.2: Cropping Intensity by Union



Source: DAE, 2016

4.1.5 Input Supply Situation

Seeds, fertilizers, pesticides, farm machineries and equipment constitute the inputs of crop production. Supply situation, price and quality affect farming practices and production. Present status of input use in the upazila is presented in the following paragraphs.

Seed: Improved seed is one of the most basic and important inputs to increase production and productivity of crops. The pace of progress in increasing crop production and productivity largely depends upon the pace with which good and quality assured seeds and planting materials are multiplied and accessed by farmers. Variety development and maintenance of foundation seeds, multiplication of improved or certified seeds, and an efficient distribution network are all important elements of a healthy and well-functioning seed sector. But seed sector in Bangladesh is characterized by dominance of the public sector, inaccurate demand estimation mechanism and limited capability of the private sector. Discussion with extension staff and allied farmers disclosed that more than 80 percent farmers use their own seeds. Only 15 to 20 percent seeds of rice and jute are supplied by BADC. Vegetable seeds are marketed by private seed companies.

Fertilizer

Most of the soils in the upazila have low reserves of plant available nutrient and cannot support optimum levels of crop productivity on their own. In addition large areas also suffer from other soil related constraints which reduce the availability of nutrients present in the soil for crop use. Among the soil nutrient deficiencies in the upazila, the most extensive and important are those of nitrogen, phosphorus and potassium.

Fertilizers, as carriers of essential plant nutrients, are used by farmers to improve the soil fertility. Discussion with different farmers and extension personnel as well as review of documents revealed that fertilizer rates applied by the farmers of Shibchar are generally well below the rates recommended. Unbalanced, or rather lopsided use of Nitrogenous fertilizers causing soil nutrient depletion. Yearly chemical fertilizer use of Shibchar as presented in the table 4.7 divulge that nitrogenous fertilizers are used more than 700 times more than other type of fertilizers.

Table 4.7: Yearly Distribution of Chemical Fertilizers in Shibchar Upazila

Fertilizer	Distribution (ton)
Urea	6300
TSP	800
MoP	800
DAP	2500
Others	525

Source: District Statistics - 2011, BBS

Irrigation

Irrigation is considered as a basic input for producing cereals and many other crops. Success of modern crop cultivation highly depends upon fulfilling water requirement

at various stages of growth. Two major sources of irrigation utilized by farmers are surface water and ground water. Table 4.8 indicates that farmers are exploiting ground water than surface water. This may be due to availability of STWs at affordable prices, one pump can be used in several borings and privatization of the equipment. Table 4.8 revealed that 74 percent farmers use LLP and 42 percent farmers use STW for irrigating their crop fields.

Table 4.8: Irrigation Status

Union/ Municipality	Cropped Area (ha)	Irrigated Area (ha)	Non- Irrigated Area (ha)	Commanded Area for Irrigation						
				Ground Water				Surface Water		
				DTW		STW		LLP		Other
				No	Area (ha)	No	Area (ha)	No	Area (ha)	Area (ha)
Bandarkhola	2050	1680	370	0		160	1120	35	560	5
Banshkandi	2520	1210	1310	0		150	1050	10	160	0
Bayratala Dakshin	1135	1048	87	0		160	1000	3	48	0
Bayratala Uttar	1870	1190	680	0	0	170	1190	0	0	0
Bhadrasan	1270	928	342	0		128	896	2	32	0
Bhandarikandi	2200	1706	494	0		230	1610	6	96	0
Char Janajat	3550	1400	2150	0		200	1400	0	0	0
Datta Para	960	960	0	1	25	250	895	14	40	0
Ditiya Khanda	3430	871	2559	0		113	791	5	80	0
Kadirpur	3250	1514	1736	0		150	1050	29	464	0
Kanthalbari	5800	2928	2872	0		400	2800	8	128	5
Kutubpur	2200	962	1238	0		62	434	33	528	0
Matbarer Char	3175	1437	1738	0		155	1085	22	352	0
Nilakhi	1859	836	1023	0		108	756	5	80	250
Panch Char	2000	970	1030	0		134	938	2	32	0
Sannyasir Char	2350	1207	1143	0		145	1015	12	192	0
Shibchar	680	680	0	0		100	680	0	0	0
Umedpur	3125	1048	2077	0		120	840	13	208	0
Siruail	2740	1295	1445	0		185	1295	0	0	0
Shibchar Municipality	420	420	0	0		85	350	6	70	0
Total	46584	24290	22294	1	25	3205	21195	205	3070	260

Source: DAE, 2016

Table 4.9: Household Utilization of Different Mode of Irrigation

System	Household No.	
	Used (n)	Average (%)
Deep Tube Well	44	10
Shallow Tube Well	183	42
Power Pump	9	2
Diesel Pump	327	74
Electrified Pump	2	0.45
Indigenous	16	4
Others	12	3

Source: DAE, 2016

Mechanized Cultivation

Like other areas of the country mechanized cultivation is gaining momentum in Shibchar upazila. The main thrust of mechanization is to reduce dependence on human labour and draft / animal power to till soil and plant, intercultural operation, and harvest crops. It contributed to timely cultivation and thus increased cropping intensity, reduced yield losses and wastage. Use of machines has also cut down the cost of threshing. Government mechanization program and subsidy in fuel and electricity yielding positive results. Table 4.10 reveals that farm mechanization is still concentrated on ploughing. Total 1073 power tillers are in operation in the upazila.

Table 4.10: Mechanized Cultivation Status

Union	Total Cropped Area	Tractor		Power Tiller		Power Thresher		Power Sheller	
		No.	Area Cover (ha)	No.	Area Cover (ha)	No.	Area Cover (ha)	No.	Area Cover (ha)
Bandarkhola	2050	2	40	40	1120	50	560	0	0
Banshkandi	2520	0	0	25	1050	30	250	0	0
Bayratala Daskhin	1135	0	0	30	450	20	300	0	0
Bayratala Uttar	1870	0	0	73	1300	90	1800	0	0
Bhadrasan	1270	0	0	30	650	10	450	0	0
Bhandari Kandi	2200	0	0	52	1100	0	0	2	100
Charjanjat	3550	0	0	20	800	15	130	0	0
Dattapara	960	1	156	80	1450	45	1200	10	400
Ditiyakhanda	3430	0	0	48	750	8	250	0	0
Kadirpur	3250	0	0	75	1450	30	600	0	0
Kanthali Bari	5800	0	0	35	700	30	500	0	0
Ktubpur	2200	0	0	169	1120	61	650	0	0
Madabarar char	3175	2	300	60	1000	70	500	0	0
Nilakhi	1859	1	50	3	300	4	20	0	0
Panch char	2000	2	250	35	650	15	600	0	0
Sannyasir Char	2350	0	0	170	1110	81	550	0	0
Shib Char	680	0	0	38	438	8	140	1	5
Umedpur	3125	0	0	80	800	2	80	0	0
Siruali	2740	0	0	0				0	0
Shibchar Municipality	420	0	0	10	600	5	300	0	0
Total	46584	8	796	1073	16838	1073	1073	13	505

Source: DAE, 2016

Household survey conducted during 2016 revealed that about 2 percent household use bullock drawn plough and 95 percent prepare their land by power tiller (Table 4.11).

Table 4.11: Use of Farm machineries by Individual Farmer

System	Household No.	
	Used (n)	Average (%)
Plough	10	2

Power Tiller	421	95
Indigenous	13	3
Others	3	1

Source: Household Survey, 2016

4.1.6 Food Security Status

Shibchar upazila is deficit in food grain production. Annual food grain demand is about 42960 tons and annual production is 39675 tons. Total food shortage is about 3285 tons (Table 4.12). Other items of food have been excluded from the calculation. Among the unions, Bandarkhola, Char Janajat Bandarikandi, Dattapara, Kadirpur, Madbarerchar, Nilakhi and Shibchar are surplus; when the rest unions and Shibchar Municipality are deficit in food production.

Table 4.12: Food Situation in Shibchar Upazila

Union	Population	Food grain		
		Requirement	Production	Surplus/Deficit
Bandarkhola	9129	1232	2075	843
Banshkandi	19436	2624	2571	-53
Bayratala Dakshin	8995	1214	825	-389
Bayratala Uttar	12243	1653	1538	-115
Bhadrasan	10339	1396	913	-483
Bhandari Kandi	10178	1374	1391	17
Charjanjat	17234	2327	4586	2259
Dattapara	24343	3286	4004	718
Ditiyakhanda	11152	1506	1396	-110
Kadirpur	14920	2014	2225	211
Kanthali Bari	19612	2648	2468	-180
Kutubpur	17373	2345	1725	-620
Madabererchar	26058	3518	3969	451
Nilakhi	12770	1724	1894	170
Panchchar	19252	2599	1890	-709
Sannyasir Char	16035	2165	1301	-864
Shib Char	5382	727	1158	431
Umedpur	23679	3197	1769	-1428
Siruali	15936	2151	1540	-611
Shibchar Munci.	24154	3261	437	-2824
Total	318220	42960	39675	-3285

Source: Calculation by the consultant

4.2 Fishery

Shibchar is the most potential upazila under Madaripur district in respect of inland fisheries. Pond culture, capture fisheries in beels, canals, dishes, etc. are common practices in the upazila. Most of the fisheries practices are traditional with a few improved carp poly cultures. A variety of species like talapia, catfish, singhi fish, koi

fish species are also used in polyculture and monoculture systems. At present fish culture in the paddy fields are gaining popularity are gaining popularity in the upazila.

Fishing is the second important livelihood option for small and landless rural families. About 60 percent of the landless fishers' families took extensive fisheries as the livelihood options when 40 percent of them practice it as side business. About 20 percent marginal and 10 percent small farmers practice semi-intensive fish farming as principal occupation.

There are 1550 fishermen engaged in fishing as their livelihood and total area of capture and culture fisheries in the upazila are 30,600 ha with annual production of 45900 tons when area under culture fisheries is 10,270 ha with annual production of 30810 tons (Table 4.10).

4.2.1 Inland Aquaculture

Among various segments of the sector, the inland aquaculture experienced fastest growth mainly through the introduction of new technologies, species and intensification and improvement of farming particularly in pond aquaculture, all over the country.

4.2.2 Pond Culture

Pond fishery is very popular in the upazila especially for the year round Carp Polyculture, Carp Golda Poly Culture, monoculture and Cat Fish Culture for the major species of Rui, Catla, Mrigel, Silver carp, Big head Carp, Silver Carp, Common Carp, Kalibaus, Tilapia, Pangus, Koi, Golda, Singhi, Magur, Pabda and Gulsha. In the upazila there are 2622 ponds covering an area of about 440 ha. (District Statistics, 2011, BBS). (Table 4.13).

Table 4.13 Resource Based Fish Production in Shibchar

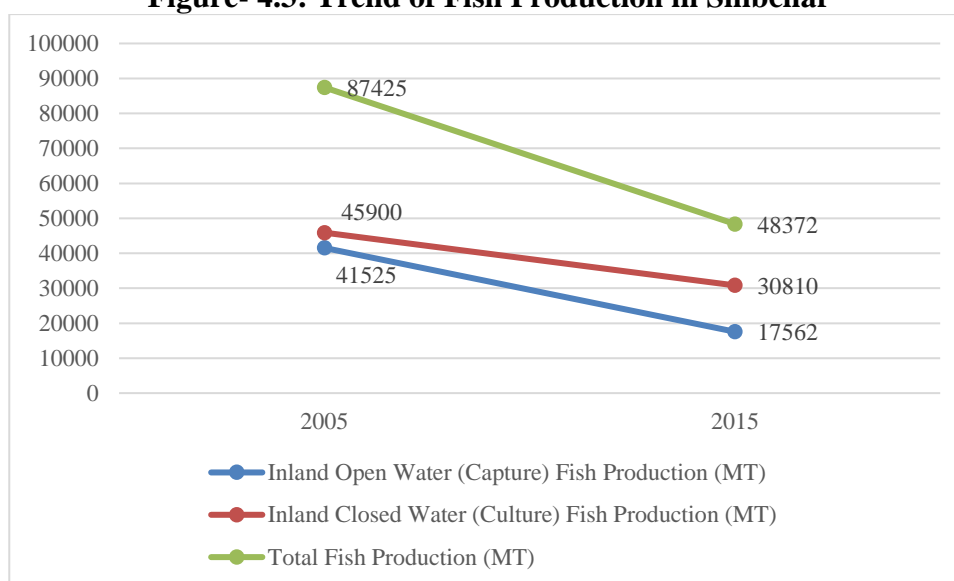
Types of Water Body	Area (ha)	Production (Ton)	% of total Production
A. Closed Water Culture (culture Based)			
i) Ponds	1116		
ii) Seasonal Cultured Water Bodies	1200		
iii) Oxbow Lakes	505		
iv) Semi-closed Floodplain	7450		
Total	10271	30810	40
B. Open Water Body (capture Based)			
i) Rivers and Estuaries	20145		
ii) Beel	2500		
iii) Baor	505		
iv) Floodplain	7450		
Total	30600	45900	60
Upazila Total	40871	76710	

Source: DoF, Shibchar, 2016

Figure- 4.3 Shows that during the last 10 years excepting pond fishery other resources either remain static or slightly increased. Pond culture slightly reduced due to riverbank erosion and development infrastructure. During the same period capture fish production increased in by 10 percent and culture fish production increased by 75 percent (Fig. 4.3).

It is shown in the Figure-4.3 that both inland open water and closed water fish production decreased during last 10 years. Inland open water (capture) fish production reduced by 58 percent when inland closed water (culture) fish production reduced by 33 percent and total fish production reduced by 45 percent.

Figure- 4.3: Trend of Fish Production in Shibchar



Source: DoF, Shibchar, 2016

4.3 Livestock

Farming of cattle, buffalo, goat, sheep, etc., constitute an important sub-sector for the economy and food security of the poor people of the Shibchar upazila. This sub-sector plays a significant role in meat, milk and egg production. The char lands offer great opportunity for dry season cattle grazing. Poultry farming, especially, duck rearing is a common round the year practice. During the field visit reveals inadequate transport and lack of technologies (like milk processing, sweet, yogurt and cheese production) for which char people cannot fully utilize these resources.

Present status of livestock and poultry population has been provided in the Table 4.14. Shibchar upazila is riverine and there is huge scope of duck farming here. But duck population is only about 53,790. Pigeon farming is another promising enterprise. As the area is famous for pulse production, commercial pigeon farming is possible here.

Table 4.14: Livestock Population

Livestock	Farm Family	Number
Cattle & Buffalo	33174	49315
Goat	45591	15200
Sheep	100	487
Cock & Hen	215	229886

Duck	120	53790
Pigeon	30	15021

Source: District Statistics-2011, BBS

Cattle and poultry farming are mainly concentrated as backyard farming practices. Commercial poultry farming is at growing stage. At present there are 82 small scale commercial poultry farms and 520 dairy farms in the upazila (District Statistics, 2011, BBS). Buffalo rearing is also popular in the upazila. Number of animal rearing per household is presented in the Table 4.15.

Table 4.15. Livestock and Poultry Farming by Individual Farmer

Type of animal	No. Reared/House		
	Min	Max	Average
Cattle	1	9	2
Buffalo	2	4	2
Goat	1	7	3
Poultry Farming	1	1500	82

Source: Household Survey, 2016

4.3.1 Poultry Farming

In Shibchar upazila commercial poultry farming is gaining popularity and emerged as an employment source for the job seeking unemployed educated people and women folk. At present there are 413 small scale poultry farms. Total number of commercial poultry farms is 82 (Upazila Parishad, Shibchar).

4.3.2 Cattle Farming

Small-scale dairy farming is becoming one of the best livelihood options for poor farmers in the upazila. There are 520 dairy farms in the upazila.

4.3.3 Goat Farming

Commercial goat farming business is gaining popularity day by day. In Bangladesh it is already an established and profitable business model. Goats are small sized livestock animal and it is very easy to raise some goats by any rural household. Even the woman and children can also raise and take care of them easily along with their regular work. Commercial goat farming in the upazila is has not developed yet. Goats are reared in the backyard with grazing in the fringe land.

4.4 Forestry

There is no typical forest in Shibchar upazila. Vegetation in the homestead, public places, roadside popularly termed, as social forestry and vegetation in the crop field known as agro-forestry constitute the forestry sub-sector in the upazila. Total area of shibchar is about 33305 ha of which about 21 percent (6910 ha) is under rural settlement and vegetation cover. Land types of the types in the upazila vary from medium high to medium land. Rural settlement is established mostly in ridge area (highland) and medium highland and even in low land raising mounds. The settlement

area comprised of dwelling houses, ponds and vegetation from annual herbs to perennial shrubs and trees. Maximum forest area found in Umedpur and minimum in Kanthalbari and Char Janajat unions. (Table 4.16).

Table 4.16: Social Forestry in Shibchar Upazila

Union	Area (ha)	Rural settlement & vegetation	
		Area (ha)	% of total land
1.Dattapara	2466	557	23
2. Kutubpur	1528	317	21
3. Banshkandi	1938	445	23
4. Sannyasir Char	1859	390	20
5. Kanthal Bari	3716	294	8
6. Umedpur	1966	765	36
7.Bhandari Kandi	1359	281	21
8. Bayratala Dakhin	934	182	20
9.Shib Char	534	115	20
10. Madabererchar	2126	600	28
11. Nilakhi	1509	340	21
12. Pachchar	1393	476	33
13. Bhadrasan	959	256	27
14. Bandarkhola	1400	149	11
15. Charjanjat	3195	239	7
16. Ditiyakhanda	785	214	27
17.Kadirpur	1996	430	22
18 Bayratala Uttar	1258	317	25
19. Siruali	1578	342	20
20. Shibchar Municipality	803	201	25
Total	33305	6910	21

Source: Consultation Workshop with DAE Field Staff, 2016

4.5 Marketing of Agricultural Commodities

Agricultural outputs markets in the upazila can be classified as primary market, secondary market and terminal markets. Usually large number of intermediaries operates in the agricultural markets. The primary markets are small local markets. These type of markets open usually twice a week. Petty traders, known as Faria, operate in these markets. They purchase directly from the farmers and assemble the produce. They perform some important marketing functions like sorting, grading, packaging and transportation. They sell outputs to the Beparis or whole sellers in the same markets or in the secondary markets at the upazila level. The secondary markets are situated in the upazila level; size of the market is much bigger than the local markets. Also number of sellers and buyers are large. Usually large number of Farias and Beparis operates in



Photo. 4.2: Agriculture Market in Shibchar

these markets and daily volume of outputs traded is also high. The Farias assemble outputs from surrounding villages. Secondary markets are well communicated with district markets and terminal markets at Dhaka. In Shibchar upazila there are 67 established markets where agro-commodities are traded (Upazila at a Glance,2015, Shibchar Upazila Parishad). Out of the total markets about 18 markets have necessary infrastructure for cleaning and grading of agro-commodities (Table 4.17).

Table 4.17: List of Markets and Growth Centers by Union

Union	Name of the market
Bandarkhola	Bondorkhola Bazar*; Mazid Hawladarer Hat;Arial Khan Ferry Ghat*;Rab Fakirer Hat
Banshkandi	Babur Hat ; Bajitpur Shakepur Hat*;Somvuk Hat;Somvuk Bazar;Natun Char Somvuk Hat
Bandarikandi	Bandarikandi; Shaeber Hat; Magurkhanda; Garir Hat
Bayratala Dakshin	Bayratala Rafiuddin Hat*
Bayratala Uttar	Shaeber Hat; Crokechar Hat *
Bhadrasan	Badrasan Bazar*
Char Janajat	Charjanat Khaser Hat*; Chiru Chowdhuryer Hat
Datta Para	Surjanagar Hat * ; Bablatala; Datta para Bazar;Ananda Bazar
Kadirpur	Manikpur Hazi Esuf Bazar; Munshi Kadirpur Hat*; Soni chander Hat*; Manikpur Hat; Kadirpur Deloar Bepari Hat Kadir Munshi Hat;Ohab Bepari hat
Kanthalbari	Chairman Gate Hat; Taltala Bazar; Char Kanda Hat;Mazgar Kanda Hat; Bangla Bazar*; Hashem Mollar Hat
Kutubpur	Kachari Kutubpur Hat; Kutubpur Nuton Hat*; Kutubpur Puraton Hat; Hoglarmath Kutubpur Hat
Matbarer Char	Matbarerchar Hat* ;Paddercharbai Bridge hat
Nilakhi	Kowar Hat*; Bagmara Hat; Kalatala Hat; Nilokhy Bandar Hat
Panch Char	Bahadurpur Hat; Panchchar Hat*; Thakur Bazar Chowdhury Hat
Sannyasir Char	Arial Kha Ferry Ghat; Shikdarhat Bazar; Munsir Hat
Siruil	Seruli Bazar*; Utrail Hat* ;Teker Hat; Sheruyir Hat
Umedpur	Chander Char Hat*; Golar Bazar; Satvagia Bazar
Shibchar Municipality	Shibchar Bazar

Source: DAM, 2016

Table 4.18 shows that farmers are getting maximum profit from poultry farming (BDT.20000.00). Other practices are at subsistence level.

Table 4.18: Household Income from Agriculture

Item	Expenditure (thousand)			Gross Income (thousand)		
	Max	Min	Median	Max	Min	Median
Crop	50	43	40	50	43	50
Poultry	30	43	43	50	43	43
Livestock	50	43	43	50	43	30
Fishery	50	43	43	50	43	43

Source: DAM, 2016

UPAZILA MAP
UPAZILA SHIBCHAR
DISTRICT MADARIPUR

UPAZILA SREENAGAR
DISTRICT MUNSHIGABJ

UPAZILA SADARPUR
DISTRICT FARIDPUR

UPAZILA LOHAJANJ
DISTRICT MUNSHIGABJ

UPAZILA BHANGA
DISTRICT FARIDPUR

UPAZILA RAJOIR

UPAZILA JANJIRA
DISTRICT SHARIATPUR

UPAZILA MADARIPUR SADAR

SHIBCHAR

LEGEND

Administrative Boundary

- International Boundary
- District Boundary
- Upazila Boundary
- Union Boundary
- Mauza Boundary
- Municipal Boundary

Administrative Headquarters

- District
- Upazila
- Union

Natural Features

- Wide River with Sandy Area
- Small River/Khal
- Water Bodies
- Forest
- Hill

Physical Infrastructures

- National Highways
- Regional Highways
- Zila Road
- Upazila Road (Pucca)
- Upazila Road (Kutcha)
- Union Road (Pucca)
- Union Road (Kutcha)
- Village Road A (Pucca)
- Village Road A (Kutcha)

Socio-Economic Infrastructures

- Health Centre
- Rural Market
- Police Station
- Upazila Health Complex
- Family Welfare Centre
- Community Clinic
- Post Office
- College
- High School
- Primary School
- Madrasah

Other Symbols

- Religious
- Gravities
- Settlement

Scale

R.F. 1:1,00,000

Notes: Information shown on this map is for the internal use of Local Government Engineering Department. Information shown on this map should not be used for any other purpose.

Compiled from: 1:50,000 Scale Base Map, 1984-85, Survey of India
GPS Survey 1999 and Re-Working in 2010

Projection: UTM (Universal Transverse Mercator)

Map Sheet No.: 60/10

LOCAL GOVERNMENT ENGINEERING DEPARTMENT

Desh Upodesh Ltd. in Association with AIBL & TechSuS
XLIV

CHAPTER-5: CHALLENGES CONFRONTING AGRICULTURE

5.1 Crop Agriculture

Despite favorable agro-climatic condition crop agriculture of the upazila is confronting various natural and manmade challenges. These are,

- low level of soil fertility,
- lack of capital for investment in farming,
- lack of farmers' access to technologies,
- farm labor crisis, and finally,
- lack of incentives due to improper marketing facilities.

Total annual cereal food requirement of the upazila is about 64000 metric tons and annual production of cereals is 51000 metric tons. The upazila is in deficit condition with respect of food production. Major constraints are discussed in the following sections.

5.1.1 River Bank Erosion

Riverbank bank erosion is the topmost problem of land degradation of the upazila. This is the most common geomorphologic process played by the river Padma and the Arial Kha. Erosion depends on type of flow, channel geometry, topography, vegetation and its variation with time and space. Riverbed depth gradually decreases due to accumulation of eroded materials from the upstream accelerate flood and riverbank erosion. Bank erosion and channel shifting of the untrained rivers are big problems to the local socio-economy and environment. It has a widespread effect on human settlement and agricultural land. There are displacement and socio economic impact due to riverbank erosion. When floods hit or the embankment erodes, people face severe problems. PRAs conducted and informal and formal discussions with local people and representatives of service providing agencies revealed that the unions situated partly or entirely on the bank of the mighty river Padma are prone to river bank erosion. Every year hundreds of families' loss their valuable household assets, lands and livelihood due to bank erosion, resulting into migration to other places or in urban areas. Most affected unions are Bandarkhola, Bayratala Dakshin, Charjanajat and Kanthalbari unions.

5.1.2 Drought

Absence of rainfall for a prolonged period is drought. It is a climatic change induced natural disaster in Shibchar upazila. It occurs when rainfall is absent for a prolonged period of time, causing earth to parch, wells to dry and underground water to fall. Other climatic factors such as high temperature, high wind and low relative humidity are often associated with drought. Drought prevails here in the pre-monsoon (March-May) period. Wide ranges of agricultural crops grown in the rabi and pre-kharif seasons become vulnerable to drought at varying degrees.

5.1.3 Monsoon Flood

Annual flooding during monsoon is common in the floodplains like, Shibchar. Occasionally, it become highly devastating in the area. Due to siltation, discussed in the previous section, reduces the drainage capacity of the rivers and canals and the narrow outlet created by siltation prolong the duration of flooding. Devastating floods occur in 2/3 years' interval. Prolonged flooding has negative impacts on crop, livestock and fisheries.

5.1.4 Water Logging

Water logging is one of the problems of Shibchar Upazila. Main cause of water logging is the siltation in the natural waterways. Low lands are usually being flooded in the early monsoon. Due to inadequate drainage system, and or silted up of drainage channels or illegal encroaching by the influential persons for their interest, water cannot move out. As a result, the low laying areas of the upazila remain inundated for three to four months in the monsoon season. Other causes of water logging are human interventions like, construction of embankments, construction of many unplanned housing and village road networks. Moreover, the problems become acute when people have a common tendency to encroach and/or blocking the waterways for making houses, shops or fish culture etc. Localized drainage congestions are reported throughout the upazila but the level and duration of drainage condition depends upon various factors. Water logging usually remain confined to medium low land to low land areas. In addition to the damage of agricultural crops, drainage congestions affect transportation system. Additionally, it affects surface water quality, causing spread of water borne diseases and other health hazards. Water logging is a acute problem of Shibchar Pourashava (Ward,1,2 and 5), and in Bandarkandi,Siruai, Sannyasir char, Nilakhai and Bayratola Dakshin unions of the upazila.

5.1.5 Brick Fields in Agriculture Land

Brickfields are known to be leading cause of land degradation. Rapid urbanization increases demand for brick and people are establishing brickfields in medium high agricultural lands near the roads. These are fertile lands capable of growing 2-3 crops in a year. Operation of brickfields in the agricultural land is carried out through collecting soils from a depth of about 1- 2 meter from agricultural land. Brickfields in Shibchar is degrading topsoil and polluting environment. Emission of huge quantity of toxic elements from brick kilns is causing serious health hazards. The brick kilns emit toxic fumes containing suspended matters rich in carbon particles and high concentration of carbon monoxides and oxides of sulphur that are harmful to eye, lungs and throat, which stunt the mental and physical growth of children. A significant amount of wood of this upazila is used for burning bricks every year, causing deforestation. Brick burning not only alters the physico-chemical properties and habitats of the nearby soils but also contributing to the pollution of environments and ecosystems. The topsoil nutrient elements and soil biota are destroyed through brick burning. Brick burning also increases the concentrations of greenhouse gases in the atmosphere. Evolved heat damages the forest and vegetation surrounding the brickfields and ultimately degrades the natural ecosystem. Smoke, dust and heat generated from the brickfields operation are the major issues of environmental hazards. Smoke and dust pollute the air of the surrounding areas that affect human settlements, educational institutions, office, market places, etc.

5.1.6 Expansion of Settlement, Infrastructure and Industries

Majority of the agricultural land in Shibchar Upazila is medium highland and medium land those are suitable for double or triple crops. But due to increased population, these fertile lands adjacent to roads are being converted into settlement areas, industries, hat-bazar, road etc. These unplanned developments of roads and infrastructures are gradually being developed everywhere within the upazila. The people are neither aware of planned township nor they care the future consequences of land loss for food security of the next generation. These sort of human interventions are aggravating waterlogging situation. Rapid and unplanned expansion of housing has been considered as one of the great challenges for sustainable agricultural production including the homestead forest. So, increased demands of housing and settlement, infrastructure, industries etc. are reducing the area of agriculture land. It threatens the ecological balance and leads to environmental degradation.

5.1.7 Improper Agricultural Practices

Majority of the people of Shibchar are engaged in farming and earn food and income from agriculture and natural resources. But to grow more crops from less areas farmers are practicing high yielding technologies in inappropriate way. Many traditional crop varieties are either disappeared or in the verge of extinction. In addition, the practice of mono cropping has caused serious deterioration of soil characteristics and a decline in soil fertility as well as productivity. There are also competing demands on land for nonagricultural uses.

5.1.8 Improper Use of Fertilizer and Agrochemicals

Although fertilizer is one of the most important agricultural inputs to increase crop production, the soil health has deteriorated in recent years due mainly to imbalanced use of fertilizers. In our condition, urea is used in disproportionate dosages, while the other fertilizers like TSP & MoP are used in much lower dosages than the requirement. This imbalanced use of chemical fertilizers is mostly due to a lack of appropriate knowledge of the farmers for cultivation of different crops, non-availability of site-specific soil fertility information and high prices. Sometimes, unavailability of required fertilizers during peak demand periods and their defective distribution system impeded the use of fertilizers in required quantity.

As proper pest management is a contributing factor for increasing production, the availability and proper use of agro-chemicals are also important area of consideration. Pesticides of all types are available but there is a marked lack of quality control. Consequently, excessive and haphazard use highly poisonous pesticides deteriorating quality of food crops as well as the environment. Farmers are using chemical fertilizers and poisonous chemicals for pest control. In most cases farmers do not follow recommended doses. Indiscriminate use of chemical pesticides and excessive use of chemical fertilizers increase water pollution cause declining the aquatic biodiversity.

5.1.9 Supply of Poor Quality Seeds

The availability of quality seed is far from satisfactory level. It is estimated that only 5% of the seeds used in the region are of good quality. People involved in agricultural

business agree that the seed issue is also to a larger extent a question of quality. Stagnation or decline in the yields have been partly attributed to the fact that farmers use too much retained seeds from earlier harvests rather than renewing the seed and also that many modern varieties are losing their vigor. From the farmers' point of view there is no efficient seed control and certification machinery in force. Seed situation is another serious constraint on raising yields.

5.1.10 Degradation of Wetland Ecosystems

Wetlands are among the productive and economically valuable ecosystems. Wetlands prevent flooding by holding water mass like a sponge. It holds water during monsoon and releases in drought. Both natural factors and manmade unplanned interventions are mainly responsible for the degradation of terrestrial and aquatic ecosystems. Due to tremendous pressure of population with limited economic resources, the ecosystems have gone under modification and alteration by human activities at various levels. The major elements of destruction are siltation, building infrastructure with inadequate drainage facilities, destruction of forest, wetland filling, improper fishing practices, water hyacinth, drying up of wetlands etc. In addition, people are converting low lying areas of the upazila for multipurpose commercial use, filling up fertile lands to build housing and similar other activities. This illegal practice is degrading the nature of wetland ecosystems. Bandarkhola, Seruail, Dattapara, Shannyasirchar, Kanthalbari, Char Janajat, etc. unions are mostly affected.

5.2 Fishery

5.2.1 Siltation of Riverbed

Siltation of the Arial Kha and the Moynakata riverbed is a common problem in Shibchar Upazila. Over a few decades, significant changes in physical features and ecology have taken place due to siltation of riverbeds. This has a negative impact on the resource base and livelihoods of wetland resource dependent people. Unplanned construction of communication structure like roads, culverts, embankments, flood regulators, etc. have caused barrier to natural water flow of the rivers and canals creating water logging in the beels and floodplains and enhances silt deposition. As soon as the beels are silted up, the conjunctions of the rivers/canals mouth are also raised rapidly resulting the destruction of the connectivity between rivers/canals and beels. This is how the water is logged at various locations. Thus, the water areas have been reduced and affected the aquatic fauna and flora especially the fisheries resources. As a result, migratory routes of the fish and other aquatic animals have been seriously disrupted causing loss of aquatic habitats and its resources. Beds of the Padma River and canals have been silted up that reduced water carrying capacity of rivers. So, the excessive load of sediment deposited in the Arial Kha River and their tributaries causes flooding during monsoon and deposits sediments in adjacent low lying areas including agricultural land, lower depressions and wetlands of the upazila. During prolonged flooding of 1988, 1998, 2002 and 2004, there were huge depositions of sediment on agricultural land that damaged the crops and lost fertility of the soil. Almost all unions of Shibchar Upazila were affected by different degrees of siltation. The trend of reduction of the beels/water bodies was found to be similar at different places with negligible exceptions.

5.2.2 Catching of Brood Stocks and Juveniles of Hilsa

The Jatka is the juvenile form of Hilsa fish. The biology and ecology of the Jatka are distinct from the adult Hilsa. Conservation of Jatka is important as juvenile species should not be fished before they reach maturity. Removing the fish before breeding age prevents reproduction processes, and therefore reduce continued growth of the Hilsa species. Economically, Jatka are smaller, therefore, has considerably less market value too. It migrates into the Padma River and its tributaries from the Bay of Bengal for breeding and nursing. Man-made influences, river siltation, closure of migratory routes, over-fishing, uses of damaging fishing gears, pollution, hydrological and climatic changes are responsible for the decline of Hilsa fish. Hilsa have significant ecological, economic and cultural importance, and are currently the focus of conservation efforts to preserve the sustainability of the fisheries.

5.2.3 Loss of Biodiversity

Shibchar upazila has been rich in biodiversity. But due to both natural and manmade factors like siltation of water channels, abuse of wetlands and disruption of aquatic network by constructing unplanned roads, embankments, expansion of housing and blocking of water channels, etc. the abundance and diversity of extremely valuable open water fisheries resources of this region are in declining trend. On the other hand, polluting the open water by runoff coming from over doses of fertilizers and pesticides/insecticides in the agricultural land etc. greatly influence the degradation of the aquatic environment and its resources. Indiscriminate using of destructive fishing gears like set bag net and current net, wetlands declined due to irrigation, destructive gears, industrial effluents, increased population, unplanned interventions for spawning & nursing and vice versa. Almost all the unions and the Shibchar municipality is more or less affected by bio-diversity loss phenomena.

5.3 Livestock

Livestock and poultry sub-sector is constrained by a number of factors. Substandard feeding and improper management practices negatively affecting the productivity of the sub-sector.

5.3.1 Technical and Management Problems

The agriculture of the upazila suffers from some technical and management problems as follows.

- i) Most small farmers lack financial resources to establish dairy, poultry units. Absence livestock production-related extension service (e.g., upazila-level livestock service is limited to mostly clinical veterinary services, and a limited breeding service is available).
- ii) Unavailability of high growth rate and high meat yielding beef cattle/ doe for fattening. Farmers are mostly unaware of semi-intensive system of goat production.
- iii) Poultry farmers lack technically skilled manpower, shortage of quality chicks/ breeding materials,

5.3.2 Inadequate Coverage of Animal Health Service

The ratio of veterinary surgeons to farm animal and poultry is as low as 1/100,000 for livestock and 1/2,000,000 for poultry. The problem is again aggravated with poor transport network leaving 80 percent of the farmers outside of veterinary service. Only about 15-20 percent of farm animals are occasionally vaccinated. Private sector investment in the animal health sector remains low and is unlikely to expand in the future, unless provided adequate policy support and extension service. While the quality and quantity of vaccine, medicine and veterinary service delivered by the DLS are inadequate, the private sector is not coming up. There is no independent authority to check the quality of domestically produced or imported vaccine, medicine, feed and other inputs and there are no provisions for control of movement and quarantine during disease outbreak or epidemics.

5.3.3 Scarcity of Feeds and Fodder

Acute shortage of feeds and fodder is one of the single most important obstacles to livestock development in Bangladesh. Feed resources for livestock are primarily derived from crop residues and by-products such as straw, grass and tree leaves. Supplementary and concentrate feed are provided rarely and inadequately. This has resulted in stunted growth, reproduction and reduced productivity. Most of the dairy, poultry and fish farmers are facing the problem of adulterated and inferior quality of commercial feeds and feed ingredients. Feed labeling and control is inadequate. Most feed millers do not disclose the necessary information on the packaging with regards to feed composition, ingredients, date of manufacturing, date of expiry, storage guidelines, energy levels, and protein and vitamin contents. Further, poor packaging causes quicker spoilage and deteriorating quality and threatening livestock, fish and human health. High price of feeds and fodder are also a problem for the smallholder livestock and fish farmers.

5.4 Marketing of Agro-commodities

5.4.1 Crop

Lack of organized market for selling farm produce is a problem for the upazila. The salient features of agricultural product markets of the region are poor infrastructure, with lack of cool chains, inadequate transports, storage and processing facilities, poor local roads and communication system, unfair practices of middlemen, etc. The farmers of char lands are suffering with inadequate transport and with small number of petty traders (farias). The marginal and small farmers are often facing problem of marketing their products and are not getting fair price due to existence of trade syndicates.

5.4.2 Supply Chain Management of Fisheries

Although aquaculture production has experienced remarkable growth recently, a business-friendly supply chain still lagging behind. Due to long and complex marketing system, producers are not getting proper price for their farm products, where consumers are paying more. As fish and fish products are most perishable goods, but there is a dearth of physical facilities and infrastructure necessary for postharvest management of fish and fish products in the upazila.

5.5 Agriculture Related Problems as Found from PRA

River Bank Erosion: PRA results revealed that Shibchar upazila is badly affected by river bank erosion. Every year hundreds of rural families those who are living by the river bank and are comparatively poor loss their household belongings with lands and after losing everything they migrate to other places or in urban areas to live on seasonal labor or depends on begging for their survival.

Water logging: Chronic water logging emerged as a major problem for crop production in the unions situated on the bank of the river Padma and Arial khan. Participants in the PRA opined that water logging problem arises mainly because most of the canals, drainage channels and low lying areas have either been silted up or been illegally occupied by influential people for serving personal interests. The problem of water logging is more acute in monsoon when water accumulated due to heavy rains and cannot recede quickly because of obstructions in the water channels.

5.5.1 Problem Identification

PRA participants identified of problems of their respective union. Table-2.1 shows, a variety of major problems have been identified by the PRA participants of 19 unions of the upazila (Table 5.1). Though problems vary from union to union, some are common for all unions. Agriculture practices of almost all unions are mostly traditional. Farmers do not get quality seeds in time and due to bad road communication fertilizers are sometimes become scarce in supply and prices become high. Due to bad road communication they face troubles in transporting agro-commodities to the market. Lack of bank branches in the remote markets impede their access to rural credit. Unions facing the Padma river complaint of river erosion and ask for bank protection.

Table 5.1: Major Problems Identified by the PRA Participants

Union	Major Problems
Shibchar	1. Problem of transport and communication 2. Lack of marketing facilities for both input and output
Panchchar	1. Inadequate road and poor maintenance of roads. 2. Low production in agriculture
Matbarer Char	1. Bad transport and communication facilities.
Sannyasir Char	1. Lack of communication facilities 2. Canals and water bodies are silted.
Kathal Bari	1. River bank erosion.
Kadirpur	1. Transport and Communication problem.
Dattapara	1. Communication problem (Roads, bridge and culvert).
Char Janajat	1. River bank erosion. 2. Lack of sufficient metaled roads in the union.
Bayratola Uttar	1. Poor condition of roads, bridge and culvert. 2. Absence of deep and shallow tube-well.
Bhadrason	1. Poor condition of Bhadrashon bazar. 2. Canals are silted; 3. Poor condition of roads and bridge.
Bashkandi	1. Problems of road facility.
Nilokshi	1. Communication problem

Union	Major Problems
	2. Canals are silted;
Bayratola Dakshin	1. Transport and Communication problem 2. Canal siltation 3. Problem of riverbank erosion.
Umedpur	1. Transport and Communication problem 2. Traditional agricultural practices.
Dittya Khanda	1. Problem of transport and communication
Kutubpur	1. Problem of transport and communication.
Bhandar Kandi	1. Problem of transport and communication 2. Canal siltation.
Siruail	1. Problem of transport and communication 2. Waterlogging problem.
BandarKhola	1. Problem of river bank erosion. 2. Problem of transport and communication.

CHAPTER-6: DEVELOPMENT POTENTIALS

Despite many challenges and constraints, the Shibchar Upazila has immense potential for diversify crop production and enhance productivity. Fisheries and livestock sub-sectors also possess huge potentials for development

6.1 Crop Agriculture

There is scope for vertical development of crop sub-sector by productivity enhancement through the use of modern varieties and improved management practices. Sustainable technology adoption through understanding of those within the environment is of prime importance. Potentials lies in the development of crop varieties and management techniques best suited in the agro-climatic condition prevailing in the area. With the above backdrop the opportunities are analyzed to determine the potentials.

6.1.1 Transformation of Crop Agriculture with Potential HVCs

With rapid changing of food basket, demands for high value nutritious crops are increasing in Bangladesh. Economic growth, rising incomes and rapid urbanization are combining to shift food demand away from traditional staples toward high value foods. This creates an enormous opportunity for farmers, traders and processors for transformation from traditional to high value crop production, processing and marketing. The production, processing and marketing of many high value crops (HVCs) are labor intensive and embodies an opportunity of rural employment generation. Benefits from cultivation of HVCs will include improvements in average farm incomes, improved nutrition among consumers and establishment of a secured base for production and post-harvest skills which would enable growers to avail themselves, over time, of higher value distribution options in the processing and export channels for crops. PRA with farming community divulged that crop productivity could be enhanced in almost all unions through better management of high yielding crops.

6.1.2 Promotion of Pulses in the Rice Based Cropping System

Pulses are major sources of protein and also most suitable for growing in the upazila. In these circumstances household livelihoods and diet could be benefited by crop diversification and intensification through fitting short duration pulses (lentil, mung bean, chickpea, field pea, peanut, etc.) into new cropping niches. This tailoring process involves- introducing new short and super short duration cultivars, use of relay cropping (sowing pulses prior to the harvest of aman rice in rabi season, and in Kharif-I season) relaying pulses in the crops of previous season.

Review of demonstration results, BBS reports and discussion with the researchers and extension personnel, unveiled that there are huge yield gaps between the achievable yields and farmers' average yield of various pulse crops grown in the upazila.

Fortunately, NARS Institutes have developed a good number of pulse varieties appropriate for fitting into the rice-based pattern. Amongst the pulse varieties Bina masur-2,9,4,5 ,6,7 and 9; BARI masur-4 and 5; Bina mas-2 &3; Bina mug 2,5,6,7,8; Bari-mug 6, 7, 8 and Bari chhola 5,6,7 are the suitable varieties to be fitted in the rice-

based cropping pattern. Potential areas exist in Dittyakhanda, Kutubpur, Bandarikhola, Kanthalbari, Sannysirchar, Dattapara and Kutubpur.

6.1.3 Enhancing Productivity of Cereals

There are yield gaps between average yield and demonstration results in the region. The average yield (Ton/ha) of cereals in different seasons (boro rice, 4.47, T. aus rice 2.0, T. aman rice 2.57, wheat 1.87 and maize 7.0), and farmers' managed demonstration yields exhibits wide gaps in yield of cereals in the region. Since the region has a severe landscape with dominance of marginal and small farmers there is urgent need of tapping additional yields by bridging the yield gaps. Due dominance of high & medium high land and maximum irrigation facilities exist, Bashknadi, Bayratola, Char Janajat, Kanthalbari, Dattapara, Dittyakhanda, Panchar and Shibchar unions are highly suitable for productivity enhancement of cereal crops with better management and using quality inputs.

Measures

Productivity enhancement of major cereals requires the following measures:

- i) Intensification of cultivation: Further increases in cereals production have to come from intensive cultivation but the option is hindered by both natural and man-made calamities of varying degrees. Use of modern varieties having stress tolerance and short duration characteristics with recommended dose of both organic manures and inorganic fertilizers and integrated approaches for pest and disease management are the core interventions towards achieving the desired goal.
- ii) Capacity enhancement of extension personnel: Traditional techniques of so called need based extension approach without ensuring accountability at all levels are not bringing desired change in the technology dissemination and adoption. Capacity of the extension personnel, especially those who are working at grass level need to be enhanced through training and exposure to the latest technologies developed by national and international research organizations as well as their efficiency in organizing commodity based farmers' groups.
- iii) Ensuring supply quality inputs and credit support: Quality inputs need to be made available at the doorstep of farming community in time and at reasonable price. As the farmers are mostly poor to enable them for using quality inputs and modern technologies credit should be provided at easy term both from GO and NGO sources. Assessment of crop based credit requirement and a committee at upazila level should monitor disbursement.

6.1.4 Establishing Jute Production Zone

Agro-climatic characteristics of the upazila divulge high suitability for jute production. Most suitable unions are Bandakhola, Kadirpur, Matbarerchar, Kanthalbari, Nilakhai, Shibchar and Umedpur having dominance of loamy and clay loam soil highly suitable for jute cultivation.

To revamp the jute sector, it is required to implement a special program along with establishing a sound marketing system.

Suggested Measures:

i) Promotion of Appropriate Jute Varieties

Lack of awareness, absence of adequate campaign & motivational programs and finally defective seed supply chain attributing increased use of low quality TLS seeds of India coming through illegal trans-boundary trading. To save the farmers from this trap, it necessary to promote appropriate jute varieties in the region. The Bangladesh Jute Research Institute (BJRI) has developed more than 15 jute varieties, of which D-154-2, CVL-1, CC-45, BJRI desi pat -5,6,7,8 and BJRI tossa pat-4,5,6 are high yielding and CVE-3, BJRI desi pat-6 are short duration. These varieties need to be popularized to the jute farmers through special campaign. Local jute farmers need to be organized, trained and provide with breeder's/foundation seeds to produce their own seeds.

ii) Introduction of Latest Techniques of Ribbon Retting

Ample availability of water is crucial for conventional retting of jute stem through immersing stem bundles in water). The system requires sufficient water source, and availability of water for growing and retting in the same locality. The technique may be up-scaled in the jute growing areas like Banshkandi, Bandarikandi, Kadirpur, Charjanajat Matbarerchar Sannysirchar, Dittykhanda (Table 4.3).

China has developed several retting systems, i) stripping the ribbons of bark from the plant on harvesting, drying and storing those to overcome winter for retting in the next summer when sufficient water is available. This technique saves time, transport cost and water. Moreover, the quality of the fiber produced is generally superior; ii) rice field retting technique taking advantage of the time and land available between two crops of rice. The bunds of the harvested rice field are raised to enable water to be ponded to a depth of about 500 mm. Both stem retting and ribbon retting can be practiced in field, thereby avoiding the pollution of normal open waters. Further retting wastes remain in the field as green manure, and the impounded water gives a measure of control over nematode infestation. In this method dark colored fiber produced because of contamination. Where irrigation water is available, a polyethylene-lined ditch 1.5-2.0 m deep will provide a useful temporary retting water facility. Jute can be rented in a ribbon to water ratio as low as 1:5.

6.1.5 Promotion of Oil Crops

a) Realizing the yield ceiling of the oil seed varieties developed by NARS Institutes

A good number of varieties developed by NARS Institutes of Bangladesh. Some of these are short duration but high yielding and potentially suitable for the region. Amongst the newly developed varieties Bina Sarissa-3,4; Bari Sarissa-10; Bina Teel 2,3; Groundnut varieties-DM-1, Jinga badam, Bari badam5,6 are potential varieties for the region. There is a need for large-scale demonstration of these varieties and scaling up of the results for large-scale production.

6.1.6 Augmenting Crop Productivity of Char lands

Char lands occupy a significant area (33305 hectares) in the upazila there are old and young char lands. Char landers are mostly poor and deprived of all public facilities available in the mainland. Agriculture is the main occupation of the char landers. With the introduction of high yielding varieties and increasing availability of quality inputs crop productivity can increase. Developing interventions depends on the kinds of char lands. These are as follows:

Table 6.1: Char lands in Shibchar

Union/ Municipality	Area (ha)	Charlands	
		Area (ha)	% of total land
1. Dattapara	2466	82	3
2. Sannyasir Char	1859	44	22
3. Kanthal Bari	3716	2243	41
4. Bayratola Dakhin	934	3	<1
5. Madabererchar	2126	29	1
6. Nilakhi	1509	31	2
7. Charjanjat	3195	787	21
8. Siruali	1578	59	4
Total	33305	3276	9

Source: DAE, 2016

Enhancing crop productivity in the relatively settled char lands:

FGDs and KIIs with farmers and extension staff disclosed that a good number of crops are grown in the char lands, but their yield is low. To enhance the productivity scientific agriculture, need to be promoted. Considering nutritional needs of the upazila and the country it is recommended to grow in large scale orange fleshed sweet potato rich in vit. A, groundnut and maize.

Special extension program need to be promoted to harness the potentials of char lands without depleting soil fertility and process of land formation. Keeping these objectives in mind a coordinated extension program with national and regional NGOs and Public extension service is required with increasing availability of seeds of newly released modern varieties along with skill development of the farming community through training.

6.2 Fishery

6.2.1 Riverine Fishery

Community based fisheries management: Large area of public water bodies exists in Nilokhai, Bayratola Dakshin, Seruail and Sannysirchar unions with low productivity of fisheries. The community based fishery management by involving CBOs and NGOs is a good option for efficient management of public water bodies. It will also create the alternative income sources for poor fishers. The local administration should arrange the distribution of public water bodies among the real fishers and their capacity need to be increased to enhance productivity.

Establishment of community managed sanctuary: Establishment and maintenance of fish sanctuaries is one of the key instruments to maintain the sources of fish fingerlings and to conserve aquatic diversity. To enhance productivity of riverine ecosystem as well as to conserve biodiversity, wetland sanctuary may be actively considered in feasible areas. The river, canals and khals of the upazila are almost silted up in upazila. Government should take up a vigorous re-excavation program of all the water bodies and in all main courses of river and canals delineating potentials location of sanctuaries.

6.2.2 Beel and Floodplain Fishery

Expansion of small-scale aquaculture technologies: In the recent past years, small-scale floodplain aquaculture is popularizing at community level. Small-scale aquaculture in potential areas may be actively considered as one of the important adaptation measures of climate change impacts. It could be an alternative option of increasing open-water productivity.

Establishment of co-management approaches: Presently government is emphasizing to ensure co-management approaches of the potential beel and floodplain fisheries to explore its due potentials. Through strengthening CBOs, co-management approaches may be established for ensuring biological production system in beel and floodplain fisheries.

6.2.3 Pond Aquaculture

For sustainable aquaculture expansion, seed (spawn/ fry/fingerling) and feed are the most important production inputs. But now-a-days quality seed and feed becomes more crucial for sustaining the aquaculture production. More attention can be paid to address the crucial issues.

6.3. Livestock

Clearly, increased livestock production will depend ultimately on the adoption of appropriate technology, improved support services, market access and infrastructural development. Following sector wise recommended development actions is need to exploring in the upazila for developing livestock resources.

Dairy sector

i) Productivity enhancement of commercial dairy farm by ensuring availability of imported semen of progeny tested Holstein- Friesian bulls having milk yield potentiality of 9,500 – 10,000 kg in 305 days, lactation period (about 32 liter/d). Inseminate to local cross-bred Holstein-Friesian cows having daily milk yield capacity of at least 10 liters with a lactation period of at least 300 days with imported semen mentioned above. Encouraging farmers to rear minimum 5 lactating cows under intensive management ensuring animal comfort, adequate nutrition, health care and breeding, proper calf and manure management. It will ensure dairy cattle that will yield more than 6000-liter milk per lactation (305 days lactation period).

For semi-commercial dairy farm inseminating cross bred Holstein- Friesian cows (yielding 6-10 liter milk a day) reared under semi intensive management system with semen of progeny tested 50 percent Holstein- Friesian bulls (50 percent Holstein-Friesian X 50 percent Local) having milk yield capacity of about 4,500 liters in 305 days lactation period. Rear 2-5 lactating cows under semi-intensive system that is that is medium level of inputs supply ensuring animal comfort, adequate nutrition, health care and breeding, proper calf and manure management. It will yield more than 3000-liter milk per lactation (305 days lactation period).

For subsistence farming through inseminating native cows reared under low input production system with semen of progeny tested/ pedigree bulls of Sahiwal, Pabna cattle, RCC, Munshigonj, other improved desi cattle. Encouraging farmers to rear 1-3 lactating cows under subsistence farming system that is moderate level of inputs supply ensuring animal comfort, adequate nutrition, health care and breeding, proper calf and manure management. To produce native dairy cattle that will yield more than 1000-liter milk per lactation (305 days lactation period).

Beef Sector

i) Productivity Enhancement for Beef

Introducing pure-bred Brahma cattle for commercial beef cattle farmers. Accordingly establishing pure-bred Brahma cattle breeding station with sufficient number of bulls (at least 5) and cows (at least 500) in the upazila headquarter. Providing soft loan, technical and regulatory support to interested entrepreneur for establishing the pure-bred Brahma cattle breeding station.

For commercial beef fattening encouraging pure-bred growing bull/steer of Brahma or Shahiwal or Shindhi or Pabna breed or cross-bred (Holstein-Friesian cross) or Red Chittagong bull calves of 150-200kg live weight in the feed lot and rear them for 4-6 months.

For commercial beef fattening encouraging farmers to rear at least 10 fattening bulls/steers under feed-lot management ensuring animal comfort, adequate nutrition, veterinary care, bio-security and proper manure management. It will ensure a growth rate of 0.8-1.0 kg/d for 4-5 months.

Productivity enhancement for Goat/Sheep by introducing purebred Boar goat and pure-bred Dorper sheep for commercial Goat/Sheep farm. Accordingly establish purebred Boar goat and pure-bred Dorper sheep breeding farm with sufficient number of bucks/rams (at least 50) and does/ewes (at least 500) in Shibchar area at private sector. These farms will supply breeding stock to the small-scale commercial high-yielding goat/sheep farm. Providing soft loan, technical and regulatory support to interested entrepreneur for establishing the pure-bred Boar goat and/or pure-bred Dorper sheep breeding station.

Poultry Sector

i) Productivity enhancement for Chicken and Duck i) by establishing parent-stock farm of RIR and Fayoumi chicken to supply commercial strain of Sonali chicken at

private sector. Providing soft loan, technical and regulatory support to interested entrepreneur for establishing the parent-stock farm of RIR and Fayomi chicken.

ii) Establishing parent-stock farm Khaki-campbell, Xing Ding, Indian Runner, Pekin and Mascovi ducks to supply commercial strains of egg and meat purpose ducks in Shibchar at private sector. Providing soft loan, technical and regulatory support to interested entrepreneur for establishing these parent-stock duck farms.

6.4 Marketing and Value Chain Management

6.4.1 Improving Post-Harvest Management and Processing

Significant post-harvest losses in fruits and vegetables, and inadequate cold storage facilities are a major constraint in the region for transformation of high-value agriculture. Due to lack of many post-harvest arrangements, the market actors use illicit preservation techniques by applying hazardous chemicals, compromising on food safety. Food contamination exposure also occurs due to lack of processing capacity and lack of access to technologies to store harvested produce.

Vegetables collection and processing centers need to be established at private level through soft loan to facilitate cleaning, sorting, packaging and transporting to urban areas. Establishing agro-processing center in the upazila will enhance employment opportunities for women.

On-farm sorting, pre-cooling, packing and storage facilities for fruits and vegetables are essentially required for distant/export marketing.

6.4.2 Improving market linkages and development of value chains

i) Improvement of roads and market infrastructure

A number of priority investments have been identified: (i) Construction and adequate maintenance of rural roads to facilitate marketing of products and access to services in particular in remote areas. (ii) Construction or rehabilitation of rural markets including the supply of potable water, drainage, and storage facilities to improve conditions. (iii) Improvement and rehabilitation of wholesale markets in major cities; (iv) Private storage facilities to reduce losses and increase value added.

ii) Capacity building of value chain actors and market promotion

The potential area investments are: (a) Capacity building of farmers for group marketing and inputs procurement at community level (b) Capacity development of farmers and market intermediaries through training in food quality and safety regulations and requirements, good agricultural practices (GAP) so as to comply with market requirements; (c) Improved post-harvest management, value chain analysis and facilitation (d) Facilitate coordinated, market-based action, harnessing the productive capacity of agriculture to drive food security, environmental sustainability and economic opportunity. (e) Enhance opportunities for participation of women for value chain development

6.5 Findings from PRA on Agriculture Related Potentials

6.5.1 Potentials of Development

The participants of each union first, chalked out a long list of potentials. Finally, with discussions the participants finally selected five potential areas. Almost all unions unanimously call fertile agricultural land as a major resource of their respective areas. They also point dairy farming and fishery as two important resources that can bring prosperity. Unused manpower has been identified another major resource. Proper employment of this resource can bring wellbeing of the local families leading to social wellbeing.

Table 6.2: Major Potentials Identified by the PRA Participants

Union	Major Potentials
Shibchar	<ul style="list-style-type: none"> • Scope of enhancing productivity of crop agriculture through use of quality inputs and practicing modern technologies; • There are immense scope of development in fisheries and livestock sub-sectors;
Panchchar	<ul style="list-style-type: none"> • Land use efficiency development for precision crop production as per land suitability; • Scope of fisheries development • Backyard poultry, goat and dairy farming; • Improving postharvest management skills of women.
Matbarer Char	<ul style="list-style-type: none"> • Productivity enhancement in crop agriculture; • Backyard poultry and dairy rearing and small scale goat/sheep and dairy farming; • Culture fisheries development through increasing availability of fingerlings and fish feeds at reasonable prices; • Development of community floodplain fisheries.
Sannyasir Char	<ul style="list-style-type: none"> • Opportunity for small scale dairy farming, backyard poultry farming; • Crop agriculture development through adopting modern technologies, increasing quality input supply and improving marketing facilities for agro-commodities; • Skill development of working people. • Community open water fisheries in the floodplain water bodies affluent in the union.
Kanthal Bari	<ul style="list-style-type: none"> • Fertile agricultural land. • Opportunity for dairy farming. • Large water body for fisheries. • Use of solar energy. • Opportunity of poultry farming. •
Kadirpur	<ul style="list-style-type: none"> • Crop agriculture development through adopting modern technologies, increasing quality input supply and improving marketing facilities for agro-commodities Animal husbandry. • Opportunity for small scale dairy farming, backyard poultry farming; • There scope for social forestry.
Dattapara	<ul style="list-style-type: none"> • There is scope for small scale dairy, goat and poultry farming

	<ul style="list-style-type: none"> • There huge scope for culture fisheries development; • There are huge fallow land which can be brought under cultivation;
Char Janajat	<ul style="list-style-type: none"> • Crop agriculture development through adopting modern technologies, increasing quality input supply and improving marketing facilities for agro-commodities; • Opportunity for small scale dairy farming, backyard poultry farming; • Community based open water fisheries in the floodplain water bodies affluent in the union.
Baratola Uttar	<ul style="list-style-type: none"> • Crop agriculture development through adopting modern technologies, increasing quality input supply and improving marketing facilities for agro-commodities; • Opportunity for small scale dairy farming, backyard poultry farming;
Bhadrason	<ul style="list-style-type: none"> • There is scope for crop agriculture development through introduction of high value crops, increasing availability of quality inputs, training of farmers, improving postharvest value addition facilities as well as marketing network; • Huge scope for culture fisheries development • Opportunity for small-scale dairy farming, backyard poultry farming.
Banshkandi	<ul style="list-style-type: none"> • Crop agriculture development through adopting modern technologies, increasing quality input supply and improving marketing facilities for agro-commodities; • Opportunity for small scale dairy farming, backyard poultry farming; • Culture fisheries development through increasing availability of fingerlings and fish feeds at reasonable prices
Nilokshi	<ul style="list-style-type: none"> • Crop agriculture development through adopting modern technologies, increasing quality input supply and improving marketing facilities for agro-commodities; • Opportunity for small scale dairy farming, backyard poultry farming; • Culture fisheries development through increasing availability of fingerlings and fish feeds at reasonable prices
Bahertala Dakshin	<ul style="list-style-type: none"> • Opportunity for small scale dairy farming, backyard poultry farming; • Crop agriculture development through adopting modern technologies, increasing quality input supply and improving marketing facilities for agro-commodities.
Umedpur	<ul style="list-style-type: none"> • Opportunity for small scale dairy farming, backyard poultry farming; • Crop agriculture development through adopting modern technologies, increasing quality input supply and improving marketing facilities for agro-commodities. • Community open water fisheries in the floodplain water bodies affluent in the union.
Dittyia Khanda	<ul style="list-style-type: none"> • Development scope for crop agriculture through bringing huge fallow land into culture; • Opportunity for small scale dairy farming, backyard poultry

	farming;
Kutubpur	<ul style="list-style-type: none"> • Huge production of onion, garlic and peanut • Opportunity for small scale dairy farming, backyard poultry farming; • Culture fisheries development through increasing availability of fingerlings and fish feeds at reasonable prices
Bhandar Kandi	<ul style="list-style-type: none"> • Crop agriculture development through adopting modern technologies, increasing quality input supply and improving marketing facilities for agro-commodities; • Opportunity for small scale dairy farming, backyard poultry farming; • Culture fisheries development through increasing availability of fingerlings and fish feeds at reasonable prices
Siruail	<ul style="list-style-type: none"> • Crop agriculture development through adopting modern technologies, increasing quality input supply and improving marketing facilities for agro-commodities • There is huge scope for orchard development in the union; • Community based open water fisheries in the floodplain water bodies affluent in the union.
Bandarkhola	<ul style="list-style-type: none"> • Crop agriculture development through adopting modern technologies, increasing quality input supply and improving marketing facilities for agro-commodities; • Opportunity for small scale dairy farming, backyard poultry farming; • Culture fisheries development through increasing availability of fingerlings and fish feeds at reasonable prices

The above areas of agriculture development potentials can be summarized on the basis of area of development and potential unions. Major potentials of the upazila is provided in the table 5.3.

Table 6.3: Summary of Development Potentials in Shibchar

1. Scope of agricultural development	Shibchar, Panchchar, Matborer Char, Sannyasir Char, Kathal Bari, Kadirpur, Dattapara, Char Janajat, Bahertala Uttar, Kutubpur, Bhadrason, Banskandi, Nilokhi, Bahertala Dakshin, Umedpur, Ditty Khanda, Bhandar Kandi, Siruail, Bandarkhola
2. Scope of fisheries development	Panchchar, Matbarer Char, Sannyasir Char, Char Janajat, Kadirpur, Dattapara, Bhadrason, Banskandi, Nilokhi, Bahertala Dakshin, Umedpur, Kutubpur, Bhandar Kandi, Siruail, Bandarkhola
3.Scope of cattle and goat farming	Shibchar, Panchchar, Matbarer Char, Kadirpur, Char Janajat, Bahertala Uttar, Nilokhi.
4. Scope for poultry farming.	Panchchar, Matborer Char, Sannyasir Char, Kathal Bari, Kadirpur, Dattapara, Bahertala Uttar, Bhadrason, Banskandi, Nilokhi, Kutubpur
5. Scope for social forestry	Kadirpur,
6. Scope of hat and baza development.	Dattapara,

CHAPTER-7: CONCLUSION

Since agriculture is backbone of rural economy, development of agriculture can help reduce poverty of the rural areas. It can raise income of rural masses, improve food security and benefit all engaged in this sector of the Shibchar upazila.

The primary goal of this report is provide a snapshot of the agriculture sector of Shibchar upazila with its bio-physical resource base, current practices, constraints and challenges along with potentials for sub-sectoral development. It also indicates future course of actions for a healthy and vibrant sector to contribute in food security, job creation and adding value to raw materials, particularly, for food industries. It can earn valuable foreign exchange through export of cash crops, specially, jute.

The information for this study has been collected and collated from diverse and reliable sources to construct a vivid picture of the state of agriculture in the upazila. Study reveals that despite significant structural changes in agriculture in Bangladesh over the past 2-3 decades, not much changes have been observed in Shibchar upazila. With the construction of the Padma Multipurpose Bridge the Shibchar will be turned into hinterland of Dhaka Mega City. Opportunities will be created to market agro-commodities of Shibchar in the Dhaka city. So agriculture in this potential upazila needs a shift from low-value traditional farming to large-scale intensive farming of high-value agro-commodities.

For the above purpose it is crucial to take the following actions:

Crop Agriculture:

- i) Demarcating and preserving suitable agricultural land;
- ii) Establishing agricultural zones for precision agriculture and prohibiting encroachment of arable lands in village/rural areas;
- iii) Not permitting brick burning within the close proximity of any agricultural zone;
- iv) Intensifying cultivation of crops and increasing productivity in the existing agricultural lands;
- v) Organizing farmers into groups and their capacity enhancement through training, credit facilities and excess to both input and output markets;
- vi) Introducing integrated program at upazila level under the leadership of upazila chairman.

Fishery:

- i) Demarcating and preserving existing water bodies;
- ii) Excavating and re-excavating water bodies and arranging community fisheries;
- iii) Establishing union based demonstration farms in both public and private sectors to support fisheries in the upazila;
- iv) Organizing fishers into groups for their capacity building.

Livestock:

- i) Demarcating and preserving potential areas for cattle, goat/sheep and poultry/duck farming;
- ii) Increasing production of existing and future sources through capacity enhancement of DLS and supplying necessary inputs and capital for the farmers.

Agriculture Market:

- i) Improvising existing rural markets with necessary facilities for cleaning, grading and packaging agro-commodities.
- ii) Ensuring access of farmers in the markets;
- iii) Constructing necessary infrastructure for temporary storing of perishable agro-commodities
- iv) Arranging vans for transporting agro-commodities to the urban area on PPP.

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গৃহায়ন ও গনপূর্ত মন্ত্রণালয়

নগর উন্নয়ন অধিদপ্তর

“প্রিপারেশন অব ডেভেলপমেন্ট প্লান ফর ফোরটিন উপজেলাস” প্রকল্প

(প্যাকেজ নং-১ দোহার ও নবাবগঞ্জ উপজেলা, জেলাঃ ঢাকা এবং শিবচর উপজেলা, জেলাঃ মাদারীপুর)

পরামর্শক প্রতিষ্ঠান : দেশ উপদেশ লিঃ ইন এসোসিয়েশন উইথ আইমা ইন্টারন্যাশনাল বিডি লিঃ এন্ড টেকনিক্যাল সাপোর্ট সার্ভিসেস লিঃ

কৃষি জরিপ প্রশ্নমালা-২০১৫

প্রশ্নমালা নংঃ [শুধুমাত্র অফিসিয়াল ব্যবহারের জন্য] উত্তরদাতার নাম :-----

তথ্য সংগ্রহকারীর নামঃ..... কোডঃ তারিখঃ

১. ভূমির মালিকানা

ক. নিজস্ব জমি শতাংশ
খ. বন্ধক নেয়া জমি শতাংশ
গ. বর্গা নেয়া জমি শতাংশ
ঘ. মোট জমি শতাংশ

২. ভূমি ব্যবহার

ক. বসত ভিটা ও তৎসংলগ্ন জমি..... শতাংশ
খ. আবাদী (মাঠ ফসলী জমির পরিমাণ) শতাংশ
গ. স্থায়ী বাগানের অধীনে জমির পরিমাণ..... শতাংশ
ঘ. অনাবাদী জমির পরিমাণ শতাংশ
ঙ. জলাশয়/পুকুর শতাংশ

৩. এক বছরে Gross ফসল উৎপাদন এর বর্ণনাঃ

কি কি ফসল উৎপাদন করেন (কোড লিখেন)	জমির পরিমাণ (শতাংশ)	উৎপাদন (কেজি)	উৎপাদিত ফসল থেকে বিক্রয় করেন (কেজি)

কোড ৩.ঃ ফসল উৎপাদন

১. ধান	২. গম	৩. পাট	৪. ভুট্টা	৫. ইক্ষু	৬. ডাল	৭. আলু	৮. বেগুন	৯. লাউ	১০. কুমড়া
১১. পটল	১২. শসা	১৩. টমেটো	১৪. ফুলকপি	১৫. আম	১৬. কলা	১৭. কাঁঠাল	১৮. লেবু	১৯. পেয়ারা	২০. লটকন
২১. অন্যান্য.....			২২. তৈল বীজ (সরিষা, বাদাম ইত্যাদি)			২৩. মসলা (পিয়াজ, রসুন, আদা ইত্যাদি)			

৪. গরু / মহিষ / ছাগল পালন করেন? ☐ ১= হ্যা ২= না ৪.১. উত্তর হ্যা হলে গরু / মহিষ / ছাগল সংখ্যা কয়টি?
 ৫. হাস মুরগী খামার আছে কি? ☐ ১= হ্যা ২= না ৫.১. উত্তর হ্যা হলে হাস মুরগীর সংখ্যা কয়টি?

৬. এসব থেকে গত এক (১) বছরে খরচ ও আয়ের পরিমাণ (টাকায়)?

আইটেম	খরচ	আয়
ফসল		
হাসমুরগি		
গবাদী পশু		
মাছ		

কোড ৬ঃ খরচ ও আয়

১. ১০০০০-২০০০০	২. ২০০০০-৩০০০০	৩. ৩০০০০-৪০০০০	৪. ৪০০০০-৫০০০০	৫. ৫০০০০+
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৭. চাষের ব্যবস্থা কি? টিক (✓) চিহ্ন দিন

১. লাঙ্গল	২. পাওয়ার টিলার	৩. স্থানীয় পদ্ধতি	৪. অন্যান্য
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৮. সেচের ব্যবস্থা কি কি? টিক (✓) চিহ্ন দিন

১. গভীর নলকূপ	২. অগভীর নলকূপ	৩. শক্তি চালিত পাম্প	৪. ডিজেল চালিত	৫. বিদ্যুৎ চালিত	৬. স্থানীয় পদ্ধতি	৭. অন্যান্য.....
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৯. আপনার শস্য ক্ষেত্রের পানি নিষ্কাশনে কোনো সমস্যা আছে কি? ☐ ১= হ্যা ২= না (হ্যা হলে ১০ নং এ যান)

১০. সমস্যাগুলো কি কি?

- ১.
- ২.
- ৩.

১১. সেচ সুবিধা সম্প্রসারণের ফলে শস্য বহুমুখীকরণ বেড়েছে কি? ☐ ১= হ্যা ২= না (হ্যা হলে ১২ নং এ যান)

১২. যদি বেড়ে থাকে তবে নতুন ফসল কি কি?

- ১.
- ২.
- ৩.

১৩. সেচ সুবিধা সম্প্রসারণের ফলে গত ১০ বছরে শস্যের উৎপাদন বেড়েছে কি? ☐ ১= হ্যা ২= না (হ্যা হলে ১৪ নং এ যান)

১৪. যদি বেড়ে থাকে তবে ফসল ভিত্তিক শতকরা কত ভাগ?

১. ধান.....%
২. ভুট্টা.....%
৩. গম
৪. সবজি
৫. ডাল
৬. তৈল বীজ
৭. পাট
৮. অন্যান্য

১৫ চাষাবাদের ধরন কি? টিক (✓) চিহ্ন দিন

১. এক ফসলি	২. দুই ফসলি	৩. তিন ফসলি
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১৬. কোথায় বাজারজাত করেন? টিক (✓) চিহ্ন দিন

১. স্থানীয় বাজার	২. স্থানীয় পাইকার	৩. বাহিরের আড়তদার	৪. মাঠ পর্যায়ে	৫. অন্যান্য.....
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১৭. কৃষি ব্যবস্থাপনা কিভাবে হয়? টিক (✓) চিহ্ন দিন

১. স্থানীয় পদ্ধতিতে	২. সরকারী ভাবে প্রশিক্ষণ	৩. বেসরকারী ভাবে প্রশিক্ষণ	৪. অন্যান্য.....
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কৃষিজাত পণ্যের মূল্য সংযোজন ও বাজারজাতকরণ

ক) বাজার প্রবেশাধিকার

পণ্যের নাম	গত ১২ মাসে বিক্রয়ের পরিমাণ (কেজি/লিটার/সংখ্যা)	কার কাছে বিক্রয়	বিক্রয়ের স্থান	বাজার হতে বাড়ীর দূরত্ব, কি.মি.	পরিবহনের জন্য ব্যবহৃত যানবাহনের নাম	পরিবহন খরচ
ধান						
গম						
পাট						
ভুট্টা						
তেল বীজ						
ডাল ফসল						
সজি						
ফল						
হাঁস/মুরগী						
দুধ						
ডিম						
গরু/মহিষ						
ছাগল/ভেড়া						
মাছ						
মসলা জাতীয় ফসল (যেমন পিঁয়াজ, রসুন ইত্যাদি. . .)						
অন্যান্য (উল্লেখ করুন-----)						

কোডঃ ক্রেতা : ১ = ক্ষুদ্র ব্যবসায়ী/ফড়িয়া, ২ = পাইকারী ক্রেতা/বেপারী, ৩ = আড়তদার, ৪ = ভোক্তা,

বিক্রয়ের স্থান : ১ = বাড়ী, ২ = বাজার, ৩ = সংগ্রহ কেন্দ্র,

যানবাহন কোড :

১ = পায়ে হেঁটে ২ = বাই-সাইকেলে ৩ = রিক্সা ৪ = ভ্যান ৫ = ঠেলা গাড়ি ৬ = বাস ৭ = ট্রাক ৮ = টেম্পো/ অটোরিক্সা/ নসিমন

৯ = নৌকা/ট্রলার ১০ = অন্যান্য (-----)

মতস্য

জলাশয়ের বিবরণ/বর্তমান অবস্থা:

(ক) জলাশয়ের আয়তন (শতাংশ):

(১) সর্বোচ্চ আয়তন-----(২) সর্ব নিম্ন আয়তন-----

(৩) গড় আয়তন-----

(খ) জলাশয়ের গভীরতা (মিঃ):

(১) শুষ্ক মৌসুমে----- (২) বর্ষা মৌসুমে-----

(৩) গড় -----

(গ) জলাশয়ে মাছ চাষের বর্তমান কার্যক্রমঃ

(১) প্রাকৃতিক আবাদ----- (২) ব্যক্তিগত আবাদ-----

(৩) দলীয় বা কমিউনিটি আবাদ----- (৪) পলি দোআঁশ-----

(ঘ) জলাশয়ে মাছের প্রাপ্যতাঃ

ক্রমিক নং	স্থানীয় নাম	গত বছরের উৎপাদন (কেজি)
১	রুই	
২	কাতল	
৩	মুগেল	
৪	গ্রাস কার্প	
৫	সিলভার কার্প	
৬	সরপুটি	
৭	তেলাপিয়া	
৮	পাঙ্গাস	
৯	কই	
১০	মাগুর	
১১	শিং	
১২	পুটি/টেংরা/ মলা/ ঢেলা	
১৩	চিংড়ি	
১৪	অন্যান্য (উল্লেখ করুন)	

(ঙ) আপনি কি মাছ/ কৃষি/ গবাদী পশু/ পোলট্রি চাষের জন্য গত বছর ঋণ গ্রহণ করেছিলেন?

☐

১= হ্যাঁ

২= না

যদি করে থাকেন কত টাকাঃ -----টাকা

(চ) কার কাছ থেকে ঋণ গ্রহণ করেছেন? টিক (✓) চিহ্ন দিন

১. এনজিও	২. কৃষি ব্যাংক	৩. বেসরকারী ব্যাংক	৪. মহাজন	৫. অন্যান্য
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Appendix 1

Appendix 2



Photo: Discussion Meeting with Field Officials of DAE Shibchar