MASTER FILE

ON

POLDER 43/2A

BLUE GOLD PROGRAM

PATUAKHALI

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Preface

This is an internal document of Blue Gold Program for the Business Development Component. All information and data inserted here to understand current situation of the polder to develop Value Chain interventions.

Blue Gold Program is a partnership between Euroconsult Mott MacDonald, Femconsult, Socioconsult, iDE and BETS. The project is lead by Bangladesh Water Development Board (BWDB) and Department of Agriculture Extension (DAE) as technical partner and is jointly funded by the Government of the people's republic of Bangladesh and the Government of the Netherlands. The project seeks to reduce poverty of the people in the coastal areas by enhanced productivity of crops, fisheries and livestock and increasing incomes by improved processing and marketing of agricultural products including value chain development.

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Acronyms

BADC	Bangladesh Agriculture Development Cooperation
BARI	Bangladesh Agriculture Research Institute
BINA	Bangladesh Institute of Nuclear Agriculture
BRRI	Bangladesh Rice Research Institute
BWDB	Bangladesh Water Development Board
DAE	Department of Agriculture Extension
DLS	Department of Livestock Services
DoF	Department of Fisheries
FAO	Food and Agriculture Organization
FFS	Farmer Field School
FGD	Focus Group Discussion
HYV	High Yielding Variety
IRRI	International Rice Research Institute
KII	Key Informant Interview
LCS	Labor Contract Society
MFI	Micro Finance Institute
NGO	Non Government Organization
CSISA	Cereal Systems Initiative for South Asia
WMA	Water Management Association
WMG	Water Management Group

1.0 Introduction and background

Blue Gold Program is a partnership between Euroconsult Mott MacDonald, Femconsult, Socioconsult, BETS and iDE. The program is lead by Bangladesh Water Development Board (BWDB) and Department of Agriculture Extension (DAE) as technical partner and is jointly funded by the Government of the people's republic of Bangladesh and the Government of the Netherlands. The project seeks to reduce poverty of the people in the coastal areas by enhanced productivity of crops, fisheries and livestock and increasing incomes by improved processing and marketing of agricultural products including value chain development.

1.1 Overall objective of the Program

"To reduce poverty by creating a safe living environment and a sustainable socio-economic development for 150,000 household living on the 160,000 ha of polders."

1.2 Specific objective

- Prepare as a Source of information for polder 43/2A
- Assist to Polder development plan by providing necessary information
- Assess present situation (land use, market, production, constraint, and scope)
- Identify potential logical intervention strategies for business development component under Blue Gold program
- Potential value chain identification, analyze them and value chain development
- Set-up specific and appropriate activities against each intervention.

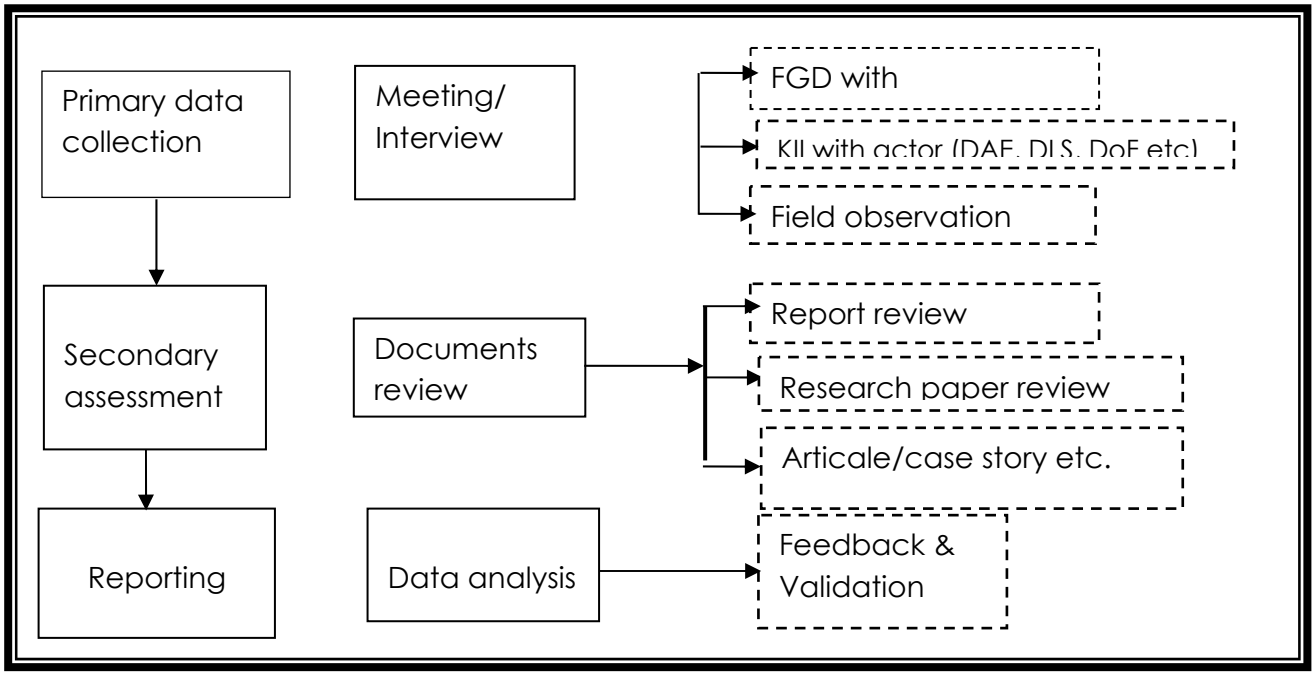
2.0 About the master file

Master file is an official document of Blue Gold Program which is the basket of information of the defined area, polder of "Blue Gold Program" implementing area. It contains polder related all information which can be used for any source of information. All Blue Gold people can use the master file for their activities and it will be help to clear Component – 4 mode of activity. This master file will help component-4 in market analysis, providing necessary information, so that they can select appropriate value chain for the economic growth of the polder dwellers. Finally, considering the strength and weakness, component will design intervention for sustainable development. Moreover, this information will help other components of "Blue Gold Program" and this is an ongoing process.

The purpose of this master file is to provide all the necessary information for the polder 43/2A to design component-04 strategy including polder development plan (PDP), Value chain identification, analysis and value chain development considering the local context. This master file provides a sound understanding the opportunities and existing practice of the producers, HHs present status, production system, input and output market situation, infrastructures, communications, geographical location, human resources, value chain actors and their function in practice, identify the weakness of the services., This master file may enable to assist component-04 to design a program in which an optimal combination of quick wins and longer term interventions are combined.

2.1 Methodology or preparing master file

The master file has been prepared by use different methodology such as, primary data collection by conducting meeting, , face to face discussion, interview with key informant, focus group discussion with different level of stakeholder, and overall field observation. Secondly, different reports and documents review in order to cross check and validation of all field information. Finally, master file has been developed by accumulating all type of analytical data, put point specific explanation against field information and observation The diagram of used different tools for accomplished the task in bellow;



2.2 Data collection process

- Key Informant Interview (KII)
- Focus Group Discussion (FGD)
- Secondary data from DAE, DLS, DOF, Union Parishad etc
- Field observation and Market visit
- Validation of collected information from relevant sources.

2.3 What is Polder?

The polder is a Dutch term. The Netherland is frequently associated with polders. This is illustrated by the English saying; "God created the world but the Dutch created Holland". The Dutch have a long history of reclamation of marshes and fenland, resulting in some 3000 polder in nationwide. Polder is an area of low-lying land that has been reclaimed from a body of water and is protected by dikes. Water enters the low-lying polder through water pressure of ground water, or rainfall, or transport of water by rivers and canals. This usually means that the polder has an excess of water, which is pumped out or drained by opening sluices at low tide.

A polder is a low-lying tract of land enclosed by embankments (barriers) known as dikes that forms an artificial hydrological entity, meaning it has no connection with outside water other than through manually operated devices.

Polders are man-made structures consisting of mud walls surrounding a hydrological unit. It is an infrastructure created in the coastal zones of Bangladesh in the 1960s to protect communities from flooding, inundation and salinity intrusion. Polder functions have changed over time and they now play a vital role in providing shelter from disasters and to increase food production. (**Source:** http://en.wikipedia.org/wiki/Polder *and* http://en.wikipedia.org/wiki/Polder#Polders and the Netherlands)

2.4 Type of Polder

There are three type polders;

1. **Land reclaimed**: from a body of water, such as a lake or the sea bed
2. **Flood plains**: separated from the sea or river by dike
3. **Marshes**: separated from the surrounding water by dike and subsequently drained.

2.5 Purpose of Polder:

Bangladesh is also ranked as being at "high-risk" of multiple devastating hazards. Bangladesh will be among the most affected countries in South Asia, with rising sea levels and more extreme heat and more intense cyclones threatening food production, livelihoods and infrastructure. Especially in the reason of agriculture development, they have also played a key role in mitigating the loss of life and damage during tidal surges.

In fact, in many areas, siltation has raised the river or other water channel - bottom to such levels that the polder region itself in fact lies below the water level. As a result, when sluice gates are opened for run out water, instead of water drain out from the polder lands, river's water rushes in, resulting in long-lasting water logging and flooded the crop land.

More over that, many of the polders were created to increase the safety of the people living in-side the or near the sea and rivers. Due to built-up high raised dikes around the sea or river to protect them.

"Polders play a crucial role in avoiding water logging from tidal surges. The recent Cyclone Mahasen was low in intensity, but the damage could have been significant from the resultant tidal surges and flooding. But the polder networks allowed the water to run off, avoiding long-term flooding," said Delwar Hossain, executive engineer of the Bangladesh Water and Development Board which maintains an extensive database of coastal polders, including their length, location, construction year and cost.

Overall, the potential of polders as a barrier to salinity greatly relies on a need for better management and maintenance anticipating future changes of climate, combined with policies ensuring controlled and sustainable management of shrimp farming," said Melody Braun, a climate change specialist of WorldFish Bangladesh.

"With the dikes surrounding the floodplains, the land is protected from the tides. One-way sluice gates regulate the water flow from the polder area out into the channel. Thus the land within the polder zone is free of water logging, salinity intrusion and can be used for farming and other agricultural work," said Mohammad Emdad Hossain, a scientist and monitoring and evaluation specialist at the Consultative Group on International Agricultural Research. (Sources; http://www.irinnews.org/report/98292/bangladesh-polders-under-threat)

2.6 Polder's situation at a glance at Patuakhali

In Patuakhali zone there are 14 Polders are in Blue Gold program most of them have been established in 1960-1970 by Water Development Board. Polders are man-made structures consisting of mud walls surrounding a hydrological unit. It is an infrastructure created in Patuakhali district as the coastal zones of Bangladesh to protect communities from flooding, inundation and salinity intrusion. Polder functions have changed over time and they now play a vital role in providing shelter from disasters and to increase food production.

Usually rainy season is the crisis period in this polder, like other area of Patuakhali upazila. In this period there is almost no work for unskilled labor and thus people have no or very limited cash in their hand.

The total communication system of this polder (43/2A) is rough as maximum roads are earthen road and in rainy season it is almost impossible to transport agricultural products from different parts of the polder. The communication situation is like below:

Polder	Union	Pacca road	Herringbone road	Kancha road
43/2A	Chato bighai	5 km	10 km	120 km
	Baro bighai	11 km	2.25 km	98 km
	Madarbunia	25 km	7 km	118 km

Unlike flooding and tidal surge, recent cyclones including the most recent *Sidr* in 2007 and *Aila* in 2009 brought substantial damage to these embankments. In response, BWDB re-focused its strategy on protecting against cyclones and developing early warning systems. [*source: Social management and resettlement policy framework (SMRPF), coastal embankment improvement project, phase-I (CEIP-I), April 11, 2013*]

While these have contributed significantly in enhancing crop production in the initial decades, they are now grasped in second generation problems, both social and environmental. Major problems are

- Siltation of river and Canals
- Weak Drainage systems and embankment
- Water logging
- Waterhyntch stagnant

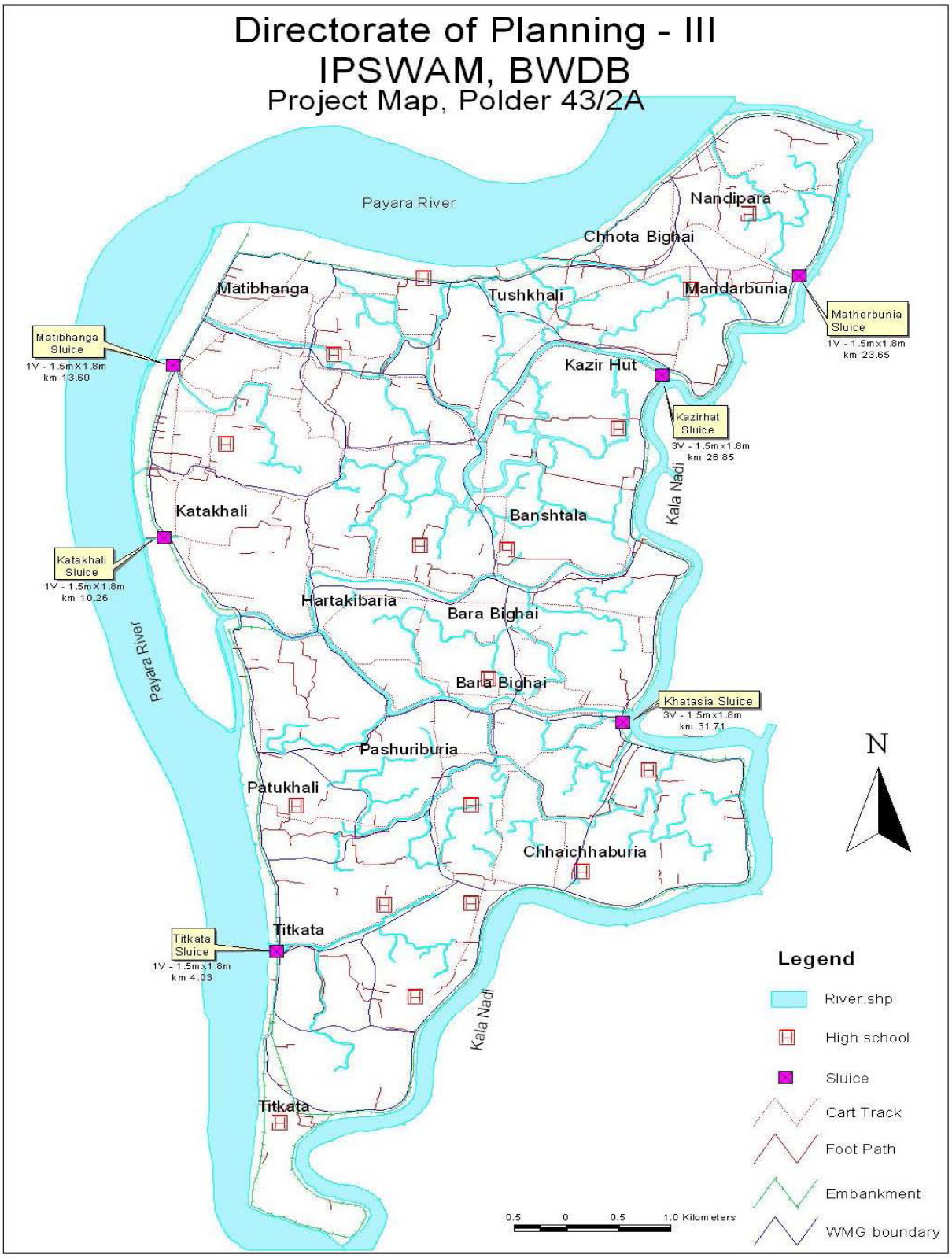
The polders listed below formed during IPSWAM period at Patuakhali Zone. "Blue Gold Program" is working in two districts, Patuakhali and Barguna under Patuakhali zonal office. There are 08 (eight) old polders of IPSWAM period of which Blue Gold will work on 06 (six) old polders and 08 (eight) new polders.

Polder no.	Upazila & District	Gross Area (ha)	Net Area (ha)	No. of WMGs	No of WMA	No. of house-holds of local stakeholders)
43/2A	Patuakhali Sadar	5,182	3,887	22	1	8,692
43/2E	Patuakhali Sadar	1,650	1,300	12	1	2,997
43/2D	Patuakhali Sadar	8,800	6,800	30	2	11801
43/2F	Amtali, Barguna & Patuakhali Sadar	4,453	3,500	27	1	6639
43/1A	Amtali, Barguna	2,675	2,200	14	1	5,105
43/2B	Galachipa, Patuakhali Sadar & Amtali, Barguna	5,460	4,000	28	6	10,382

3.0 Description of polder 43/2A

3.1 Geographical location

Polder 43/2A is located about 13kms far from the Patuakhali town and lies in between 22°13'30" - 22° 21'15" North and 90°12'15" - 90°17'45" East. The gross area of the polder is about 5,782 hectares, with a net cultivable area of 3,887 hectares. It is bounded by Payra river on the north, Gulishakhali Khal on the south, Gulishakhali Khal and Madarbunia Khal on the east and Payra river on the West. It is the boundary between patuakhali Sadar and Mirzaganj upazila on the North-East. The polder is under AEZ 13 & 18 Ganges tidal floodplain.


Directorate of Planning - III
IPSWAM, BWDB
Project Map, Polder 43/2A
Payara River
Nandipara
Chhota Bighai
Matibhanga
Tushkhali
Mandarbunia
Matherbunia Sluice
1V - 1.5mx1.8m
km 23.65
Matibhanga Sluice
1V - 1.5mX1.8m
km 13.60
Kazir Hut
Kazirhat Sluice
3V - 1.5mx1.8m
km 26.85
Kala Nadi
Katakhali
Banshtala
Katakhali Sluice
1V - 1.5mX1.8m
km 10.26
Hartakibaria
Bara Bighai
Payara River
Bara Bighai
Khatasia Sluice
3V - 1.5mx1.8m
km 31.71
Pashuriburia
Patukhali
Chhaichhaburia
Titkata
Titkata Sluice
1V - 1.5mx1.8m
km 4.03
Kala Nadi
Titkata
N
Legend
River.shp
High school
Sluice
Cart Track
Foot Path
Embankment
WMG boundary
0.5 0 0.5 1.0 Kilometers

3. Weater

Patuakhali has a tropical wet and dry climate. Maximum temperature of this district is 33.3°C and appears in the month of May, minimum 12.1°C appears usually in January. Annual rainfall is 2506 mm that maximum falls in June, July, August and September. Patuakhali district is is very near (78km) the sea of Bay of Bengal and it is known as Sagar Kanya. Thus Patuakhali faces frequently become victim of different cyclone and tidal bore.

3.3 Administrative Units

Polder 43/2A consists with 15 villages under 10 mouzas of two unions-Baro Bighai and Chato Bighai, and one mouza of one union- Madarbunia under Patuakhali Sadar Upazila of Patuakhali district.

3.4 Area

Gross benefited area of Polder 43/2A is 5,782 ha, net cultivable land is 3,887 ha, Embankment length is 39 km, Regulator number- 21, Flashing Inlet No.-03 and Drain Channel 37 Km. Polder 43/2A consists with 10 mouzas under 3 Unions (including one village of one Union (Madarbunia) of Patuakhali Upazila of Patuakhali district; the 3 unions are Chato bighai, Baro bighai, and Madarbunia (partly).

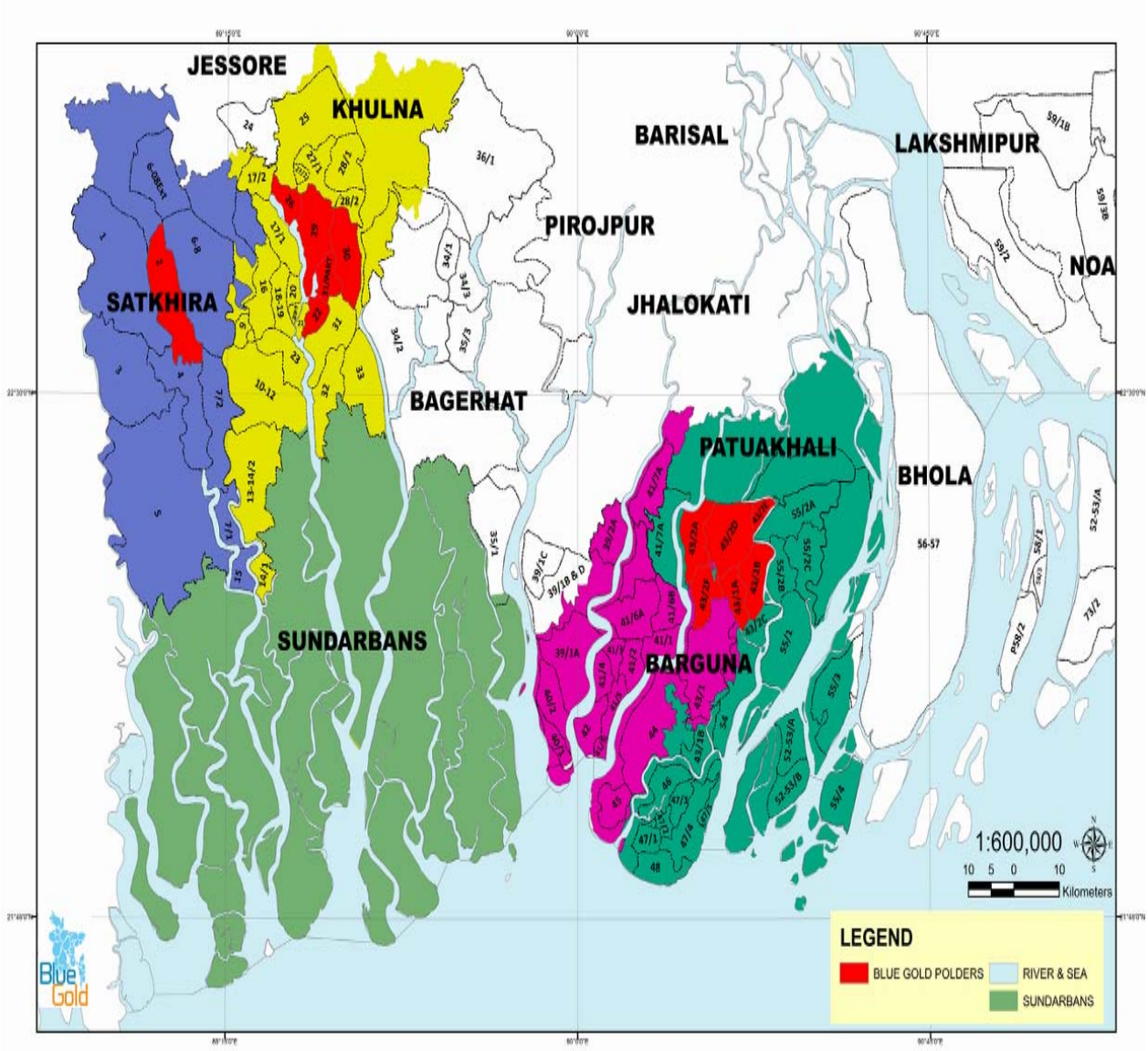
3.5 Description of Polder 43/2A

The Polder 43/2A has been constructed in the year 1985-1987, it has total 39 kms embankment and benefited area is 5,782 hectars. It is bounded by pyra riverand Gulishakhali Khal and Madarbunia Khal. Polder 43/2A consists with two unions, 11 mouzas, 15 villages and 22 WMGs and 10,453 HHs are under Blue Gold Program at polder 43/2A. Polder 43/2A is enriched with natural ecosystem which consists of khals, canal, fisheries, community/private forest and other natural resources. The polder has a lot of opportunities as well as vulnerabilities also. The salinity rate and other natural hazards are increasing day by day as reported by the local people. The area is exposed to severe cyclone and storm surges that cause huge sufferings in human lives and loss of agricultural crops as well as other assets of the people.

Polder 43/2A is not so far away from Patuakhali town its one union Choto Bighai

is about 20 Km, Baro bighai 24 km and Nandipara of Madarbunia union 11km away from Patuakhali Sadar upazila headquarter by road communication. The transport is by Rikhsa van, Autobyke or M otor cycle.

On the other hands, the polder has fertile agricultural lands and different natural water bodies, which are potential opportunities for income generating for the people.



BLUE GOLD PROGRAM POLDER MAP

4.0 Human resource

Table-1: Demographic ifno

Polder	Union Name	Total HH no.	Population			Education rate (%)
			Total	Male	Female	
43/2A	Chato bighai	4658	22,092	11,532	10,560	40
	Baro bighai	5020	19,333	9,518	9,882	57
	Madarbunia (One village)	775	3,673	1,908	1,765	46

4.1 Table-2: List of WMG and potential member no.

Name of Polder	Name of Union	Name of WMG	Name of Village	Distance from Upazila HQ Km.	Potential WMG Members
43/2A	Baro Beghai	Dakshin Bighai (Dakshin)	Baro Beghai	24	924
	Baro Beghai	Dakshin Bighai Bighai (Uttar)	Baro Beghai	23	504
	Baro Beghai	Dakshin Titkata	Titkata	26	630
	Baro Beghai	Pasaribunia	Pasrbunia	23	370
	Baro Beghai	Paschim Bara Bighai	Baro Beghai	22	770
	Baro Beghai	Paschim Kewabunia	Kewabunia	27	482
	Baro Beghai	Paschim Titkata	Titkata	25	442
	Baro Beghai	Patukhali	Patukhali	23	278
	Baro Beghai	Purba Kewabunia	Kewabunia	22	976
	Baro Beghai	Purba Bara Bighai	Baro Beghai	24	778
	Baro Beghai	Purba Titkata	Titkata	27	350
	Chato Beghai	Bhajna	Bhajna	19	246
	Chato Beghai	Haritakibaria	Hartakibaria	18	896
	Chato Beghai	Kumarkhali	Kumarkhali	17	256
	Chato Beghai	Madhya Matibhanga	Matibhanga	20	392

	Chato Beghai	Matibhanga-Chhota Bighai	Matibhanga	19	910
	Chato Beghai	Paschim Chato Bighai	Chato Beghai	18	574
	Chato Beghai	Paschim Matibhanga	Matibhanga	23	294
	Chato Beghai	Purba Matibhanga	Matibhanga	20	274
	Chato Beghai	Purba Chhota Bighai	Chato Beghai	20	478
	Chato Beghai	Tushkhali	Tushkhali	17	700
	Madarbunia	Madarbunia Nandipara	Nandipara	11	1086

Source: Component-1, Blue Gold Program, Patuakhali

4.2 Table-3: List of Community Organizers and their WMGs:

Sl. #	Name of Community Organizer	Name of Union	Name of WMG
1.	Anwar Hossain Suzom 01767495393	Madarbunia	Madarbunia Nandipara
		Chota Bighai	Purba Chhota Bighai
			Paschim Chato Bighai
			Tushkhali
			Matibhanga-Chhota Bighai
2.	Serajul Islam 01716-344448	Baro Beghai	Paschim Titkata
			Purba Titkata
			Purba Kewabunia
			Pasaribunia
			Dakshin Titkata
		Chota Bighai	Bhajna
3.	Lipy Akter 01736-141919	Chato Beghai	Haritakibaria
			Kumarkhali
			Madhya Matibhanga
			Paschim Chato Bighai
			Paschim Matibhanga
			Purba Matibhanga
4	Runa Nandi 01715-485317	Baro Bighai	Dakshin Bighai (Dakshin)
			Dakshin Bighai Bighai (Uttar)
			Paschim Bara Bighai
			Paschim Kewabunia

4.3 Table-4 List of FFS at Polder 43/2A

Sl #	Name of FFS	WMG	Name of FO	Mobile no. of FO
1.	Paschim Titkata FFS	Paschim Titkata	Feroj Alam	01710618697
2.	Purba Kewabunia FFS	Purba Kewabunia		
3.	Dakhin Bighai dakhin FFS	Dakhin Bighai dakhin		
4.	Patukhali FFS	Patukhali		
5.	Purba Titkata FFS	Purba Titkata	Rasel Miah	01727465316
6.	Paschim Kewabunia FFS	Paschim Kewabunia		
7.	Purba Baro Bighai FFS	Purba Baro Bighai		
8.	Paschim Baro Bighai FFS	Paschim Baro Bighai		
9.	Hartakibaria FFS	Hartakibaria	Asma Akter	01771483550
10.	Kumarkhali FFS	Kumarkhali		
11.	Paschim Matibhanga FFS	Paschim Matibhanga		
12.	Purba Chato Bighai FFS	Purba Chato Bighai		
13.	Tushkhali FFS	Tushkhali	Rohima Begum	01741411995
14.	Madhya Matibhanga FFS	Madhya Matibhanga		
15.	Purba Matibhanga FFS	Purba Matibhanga FFS		
16.	Matibhanga Chato Bighai FFS	Matibhanga Chato Bighai		

4.4 Table-5 List of WMG and their distance from Upazila Sadar

Name of Polder	Name of Union	Name of WMG	Name of Village	Distance from Upazila HQ in Km.
43/2A	Baro Beghai	Dakshin Bighai (Dakshin)	Baro Beghai	24
	Baro Beghai	Dakshin Bighai (Uttar)	Baro Beghai	23
	Baro Beghai	Dakshin Titkata	Titkata	26
	Baro Beghai	Pasaribunia	Pasrbunia	23
	Baro Beghai	Paschim Bara Bighai	Baro Beghai	22
	Baro Beghai	Paschim Kewabunia	Kewabunia	27
	Baro Beghai	Paschim Titkata	Titkata	25
	Baro Beghai	Patukhali	Patukhali	23
	Baro Beghai	Purba Kewabunia	Kewabunia	22
	Baro Beghai	Purba Bara Bighai	Baro Beghai	24
	Baro Beghai	Purba Titkata	Titkata	27
	Chato Beghai	Bhajna	Bhajna	19
	Chato Beghai	Haritakibaria	Hartakibaria	18
	Chato Beghai	Kumarkhali	Kumarkhali	17
	Chato Beghai	Madhya Matibhanga	Matibhanga	20
	Chato Beghai	Matibhanga-Chhota Bighai	Matibhanga	19
	Chato Beghai	Paschim Chhota Bighai	Coto Beghai	18
	Chato Beghai	Paschim Matibhanga	Matibhanga	23
	Chato Beghai	Purba Matibhanga	Matibhanga	20
	Chato Beghai	Purba Chhota Bighai	Coto Beghai	20
	Chato Beghai	Tushkhali	Tushkhali	17
	Madarbunia	Madarbunia Nandipara	Nandipara	11

4.5 Table-6 Institutional information

Public Institute	DAE, DoF, DLS, , BWDB, LGED
Private Institute	ACI, ACME, Lal teer, Syngenta, Bayer crop science, Metal agro, Squire have strong distribution and supply chain in the district headquarter and Upazilla level
Research institute	Regional Horticultural Research Institute-BARI, Patuakhali, Science and Technological University (PSTU)
Private entrepreneurs (Beyond the polder)	M/S. Chanchal Hatchery, Bay of Bengal Hatchery

4.6 Table-7 List of educational institute

Polder	Union	Infrastructures		Remarks
		Name	Number	
43/2A	Barobighai	Primary School	17	Govt.-15
		Secondary School	3	Private
		College	2	
		Madrasha	7	
		Cyclone shelter	4	
	Chatobighai	Primary School	15	Govt.-8
		Secondary School	2	Private
		College	1	Private
		Madrasha	8	Private
		Cyclone shelter	3	
	Madarbunia	Primary School	57	
		Secondary School	19	
		College	3	
		Madrasha	19	

4.7 Working NGOs in the polder

It was mentioned earlier this polder is under Patuakhali District Sadar upazilla and there are some Non-governmental activities running at the polder area.Different projects have their activities here, who are involved in development work. But most of the formal organizations are involved in micro credit program.

Table-8 Formal NGO working in Polder 43/2A:

SL	Name of Organization	Major Activity
1.	BRAC	Agriculture development and micro credit
2.	Dhaka Ahasania mission	Disaster and Livelihood
3.	Save the Children (Nobo Jibon)	For improving of mother and child nutrition
4.	iDE & CYMMIT (CSISA – MI)	Agricultural Mechanization
5.	iDE-PROOFS	Livelihood and Market development
6.	Susilon, Max Foundation	working for water and sanitation
7.	Grameen Sakti, Karania, RDF	Solar Energy
8.	Islamic Relief	Disaster and livelihood
9.	Uddipon	Livelihood program
10.	ASA	Micro Credit
11.	Grameen Bank	Micro Credit
12.	Codec	Micro Credit and Livelihood program
13.	Padakhep	Micro credit
14.	Muslim Aid	Micro credit and Loan for SME
15.	BDS	Micro credit

4.8 Financial Services in the polder

About 60-70% HHs are involved with borrowing money from micro finance institutions like: BRAC, ASA, Padakhep, CODEC, Uddipon, Muslim Aid provide loan for agriculture, micro and small enterprise. Agriculture loan range Tk 5,000-49,000 with weekly installment, Micro-enterprise loan range Tk 5,000-150,000 weekly/monthly repayment installment, small size enterprise loan range Tk 100,000-1,000,000 weekly/monthly repayment installment.

There is also existence of non-formal credit services. Usually traders or local Bapari get credit from upper tires, like- large Baparies, Arothders, whole sellers, processers or millers. For borrowing from a person/local investor; sometime borrower has not to pay interest against the loan or sometime they may have to pay 100 taka interest against 1,000 taka for one month, i.e. - 120% interest rate.

The socio-economic survey of "Blue Gold" shows that about 30% HHs have the membership in cooperative at this polder and 70% HH have no membership. The main relationship is credit. Female membership is rather higher than man.

4.9 Mobile Coverage

This polder is under all mobile operator coverage in Bangladesh, like:

- Grameen phone
- Banglalink
- Teletalk
- Airtel
- Robi
- Citycell

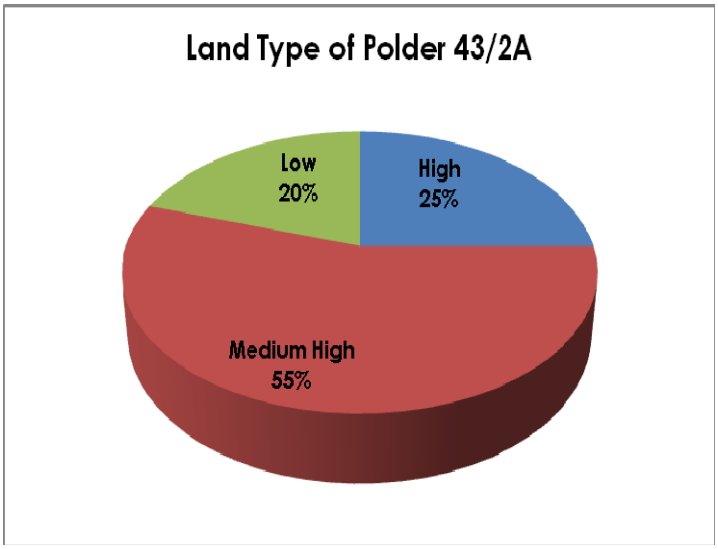
Among all the operators Grameen phone and Banglalink network coverage is fair at Polder 43/2A. Around 80-90% HHs use mobile for call through incoming and outgoing. At HHs level internet operation through mobile is an unknown feature. Maximum mobile operators are providing agriculture information (Mainly focused on production) through mobile taking a charge which could be a good source of production and market information by facilitating them to make understand how to use.

5.0 Natural Resources

Polder 43/2A is reach in various natural resources. In this section describe only agricultural production related resources.

5.1 Land characteristics of the polder

Land type is the dominant factor guiding choice of crops and cropping patterns of any area. Selection of crops/cropping patterns largely depends on the topographic position of land in relation to seasonal inundation depth and its duration. Lands, which are above normal inundation level, can provide a wide range of opportunities for growing both perennial and year round annual



dry-land crops. The major land types of this polder are medium high land 55%, and high land 25%, and the rest are low land area. It indicates that most of the land areas remain under moderately monsoon flooding and suitable for wetland crop cultivation. The limited high land is not inundated by monsoon flooding but other areas are inundated by the monsoon flooding for 4 to 5 months at various depths upto 90 cm.

5.2 Soil characteristics (Polder)

There are two agro-ecological zones in the Polder 43/2A namely Ganges Tidal floodplain (AEZ-13) and Young Meghna Estuarine Floodplain (AEZ-18)non-calcareous and loamy. The soil is formed from alluvial sediments of the rivers crossing this upazila. They are seasonally flooded, poorly drained soil developed in medium texture to fine textured alluvial deposited. Silty soils are predominating but there are significant amount of silty clay or clay soil found in shallow basined areas. The soils are moderately to very slowly permeable having well to poor moisture retention capacity in the dry season. The soil PH range is 5.5 to 7.5. Soil salinity range from very slightly to moderately saline ((2-4 ds/m)and partly strongly saline in dry season.

5.3 Water resource in the polder

Some places in the polder (43/2A), for salinity problem ground water is not suitable to use for irrigation in the dry season (March- May). Moreover, the sweet water layer very deep, thus shallow tube well (STW) and deep tube well (DTW) are not established in the Polder/Upazilla for irrigation purpose. But the area is bounded by river, canal and Khal and that source might be used in irrigation especially in dry season. So crops cultivation in this area is rain dependent. Sweet water preservation for irrigation use has not yet well developed. More over saline water intrusion through sluice gates by seepage is making sweet water unsuitable for irrigation. So water stored inside for irrigation during dry season could not be functioned.

To solve these problems inside the polder's canals, ponds and Khals need to be re-excavated for preserve sweet water during rainy season and use in irrigation during dry season. This will help solve the problem to cultivate crops in vast area during Rabi/winter Season.

To manage the tidal water there are 22 WMGs under 1 WMA named is Bighai in polder 43/2A. In 22 WMGs about 8,645 HHs members are involved and benefited through this system.

5.4 Water Management Body in the Polder

There are 22 water management group (WMG) in ploder 43/2A.

SL. No	WMGs	No. of households of local stakeholders	No. of Potential WMG members (70%)			Savings (Tk.) Deposits up August, 2014	
			Male	Female	Total	Male	Female
1	Dakshin Bighai (Dakshin)	660	462	462	924	25580	27470
2	Dakshin Bighai (Uttar)	360	252	252	504	5300	1900
3	Dakshin Titkata	450	315	315	630	7360	6800
4	Pasaribunia	264	185	185	370	17180	10300
5	Paschim Bara Bighai	550	385	385	770	13690	21410
6	Paschim Kewabunia	344	241	241	482	3850	2250
7	Paschim Titkata	315	221	221	442	21340	9380
8	Patukhali	199	139	139	278	15840	17170
9	Purba Kewabunia	697	488	488	976	16670	10520
10	Purba Bara Bighai	556	389	389	778	14560	5990
11	Purba Titkata	250	175	175	350	18280	6200
12	Bhajna	175	123	123	246	6970	11960
13	Haritakibaria	640	448	448	896	43030	18470
14	Kumarkhali	183	128	128	256	39060	28240
15	Madhya Matibhanga	280	196	196	392	6020	2040
16	Matibhanga-Chhota Bighai	650	455	455	910	25360	9500
17	Paschim Chhota Bighai	410	287	287	574	12750	5094
18	Paschim Matibhanga	210	147	147	294	22290	14080
19	Purba Matibhanga	196	137	137	274	27010	25136
20	Purba Chhota Bighai	341	239	239	478	13675	14885
21	Tushkhali	500	350	350	700	16240	15610
22	Madarbunia Nandipara	775	543	543	1086	38680	23730
Total		**9005**	**6305**	**6305**	**12610**	**410735**	**288135**

5.5 Fisheries

In Bangladesh fisheries provides 60% of the national animal protein and this sub-sector contributes about 5% of the GDP and about 9% to the foreign exchange earnings. Nearly, 1.2 million people directly employed in this sector and another 11 million are indirectly engaged in activities related to this sector.

Wet land distribution:

The Polder has a total wet land area of 1,276 hectares which 240 hectares are under aquaculture. Aquaculture comprises of homestead pond fish culture, prawn culture and commercial aquaculture. The open water fisheries are consists of river, canal and floodplain.

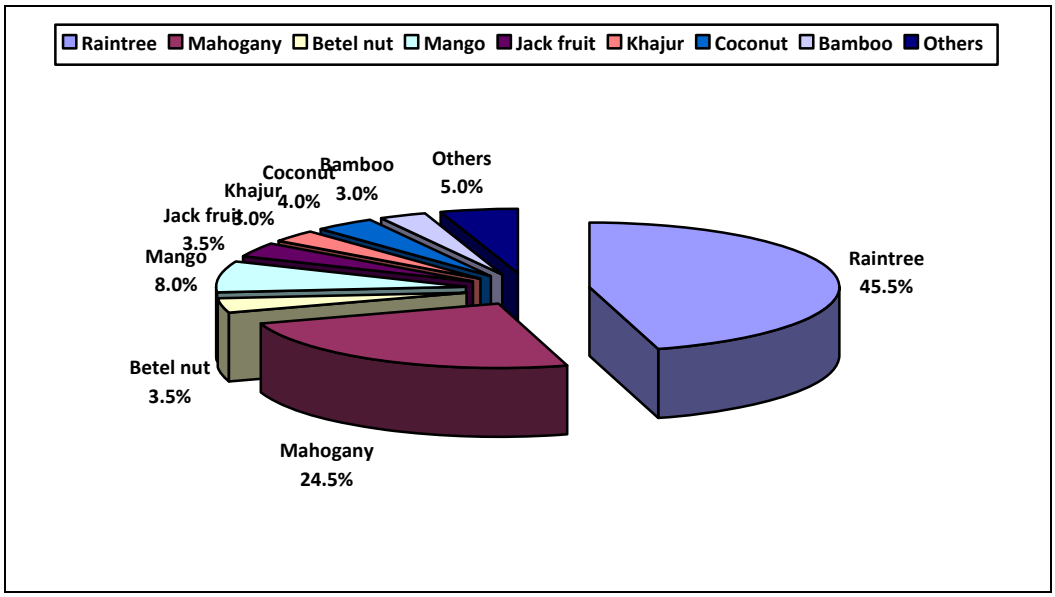
Table-9: Wetland distribution at polder 43/2A

Union	Total area (ha.)	Pond culture (ha.)	Fish culture (ha.)	Prawn culture (ha.)	Total culture (ha.)	Total capture (ha.)	Total wet land (ha.)
Chato Bighai	2,975	105 (3.53%)	09 (0.3%)	01 (0.03%)	115 (3.87%)	577 (19.39%)	692 (23.26%)
Baro Bighai	3,444	115 (3.34%)	04 (0.12%)	06 (0.17%)	125 (3.63%)	458 (13.3%)	583 (16.93%)
Madar bunia	2809	128 (4.56%)	4 (0.14%)	1 (0.04%)	133 (4.73%)	95 (3.38%)	228 (8.12%)

5.6 Homestead/community forestry

Homestead forest is a forest for the people and by the people, grown on marginal and fallow land of homestead area, beside roads, railway, embankment, river, khal and on fallow highlands characterized by a combination of annual and perennial forest species. The homestead forestry is a promising sector in this area which accounts for 48% of the total supply of saw and veneer logs, 70% of fuel wood in the rural areas,.

In polder 43/2A raintree occupies highest number among timber species, which is about 45.5% of the total planned forest. The next is Mahogany 24.50%, Betel nut 3.50%, mango 8.00%, jackfruit 3.50%, Khajur 3.00%, coconut 4.00%, Bamboo 3.00% and others are 5.00%.

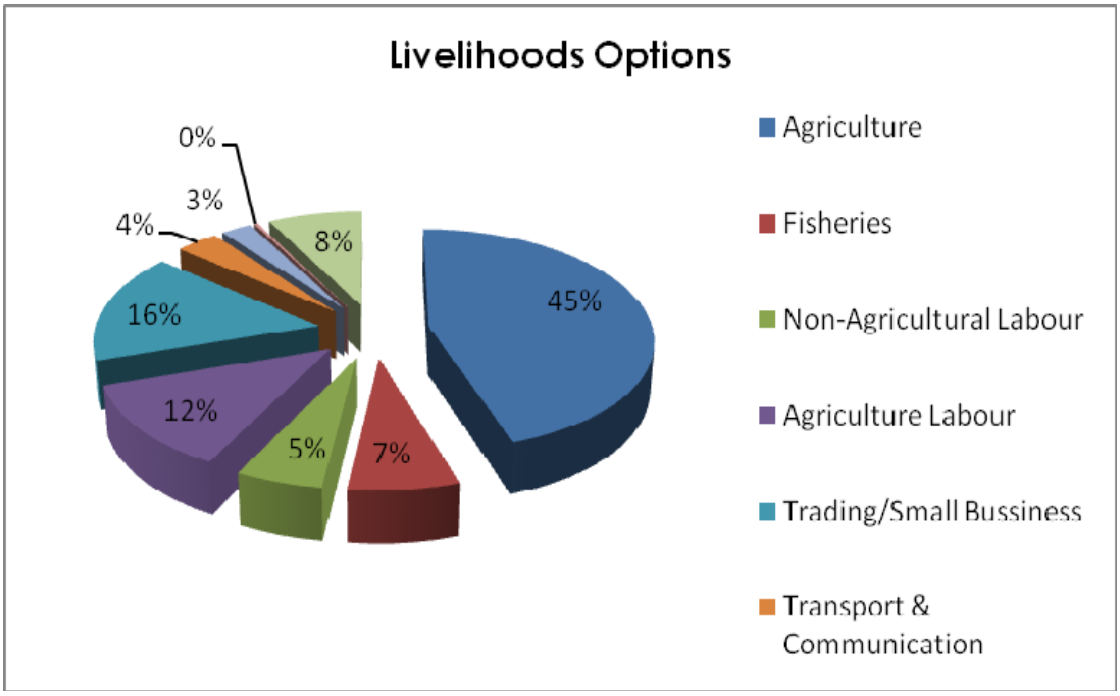


The land use in polder 43/2A is mainly with profuse homestead forest, water bodies, fisheries and agricultural land. Settlements with community/homestead forestry possess mainly the highland areas above normal flood level which are about 25% of the total area of this polder.

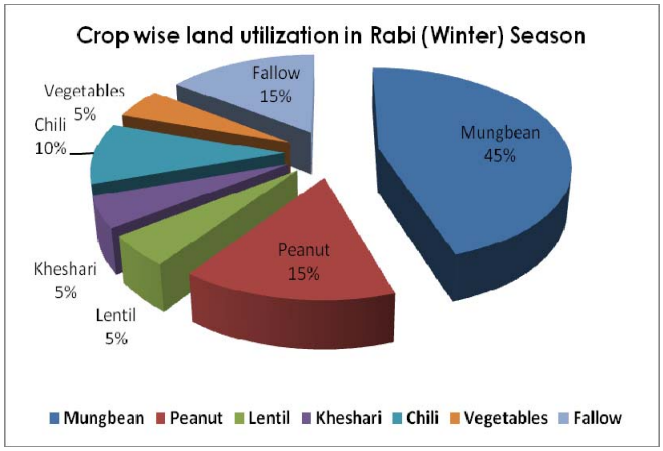
6.0 Livelihoods Options of the polder

Livelihoods options of the people largely depend on the resources available at the locality and household level in terms of ownership and access. Land is being considered as a major determining factor of the socio-economic condition of rural households, though there are some other factors that also contribute to define their social classes. Occupations and relation of production characterize social groups like agriculture labor, farmer, fishermen, traders, Rickshaw van puller and landless etc. Livelihoods of different social groups are affected if the land and other natural resources are not properly managed and restricted to access. The number of landless people is increasing day by day in this polder due to the lack of employment creation opportunities. As a result, most of the people are shifting their traditional professions with day laborers, rickshaw pullers etc.

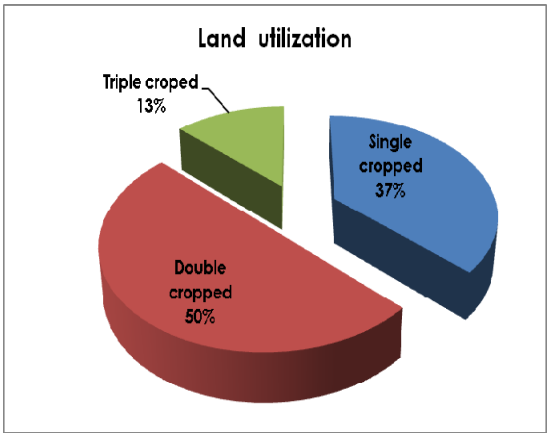
The main livelihoods sources of the polder are about Agriculture 45.00%, fisheries 6.5%, non-agricultural laborer 5.50%, agricultural laborer 12.50%, commerce/business (including small business) 16.00%, transport and communication 3.50%, service 2.50%, religious service 0.30%, rent and remittance 0.50% and others 7.70% of the people.



6.1 Agriculture



The total cultivated land is 3,887 ha where single cropped area is 37%, double cropped area 50% and triple cropped area 13% and the cropping intensity is 212%. The major cultivated crops in the polder 43/2A at Karif-1are Aush rice-15%, Sesame-10% and rest 75% of land are remain fallow ; in Khaif-2 T-aman-95% of land and rest 5% land remain water logged; and in Rabi (winter) Pulse & Oilseeds-70% of cultural land (Mungbean-45% of land, Kheshari-5% of land, Lentil-5% of land and Ground nut-15% of land), Vegetables (Red amaranth, Radish, Cauliflower, Cabbage, Spinach, Brocoli, Sweet potato etc.)-5% of land, and spices (Chili)-10% of land and 15% land remain fallow.



In summer cultivated vegetables are Pumpkin-

7%, Bitter gourd-25%, Ash gourd-2%, Ridge gourd-7%, cucumber-5% and Snake gourd-4% and in winter Bottle gourd-25% and country bean-25% are grown as dyke crops. The homestead are predominantly by forest plant including vegetables like-Danta (Amanath), Okra, Cucumber, Ridge gourd, Red amaranth, Spinach, Cabbage, Brocoli, Radish, Tomato and Country bean etc.

In polder 43/2A the most promising crops are mungbean, groundnut/and chili. Kakrol and pointed gourd (Patal) not cultivated as new crop sunflower is may be the emerging crop to this polder.

6.1.1 Cropping Pattern/Systems:

The land of this polder is dominated by agricultural crop cultivation, which cultivated mainly under rainfed condition. The agricultural practices are mainly depending on favorable natural environment. The present cropping intensity is 212% and the major cropping patterns/systems are as below:

i. T-Aman Rice — Mungbean — Fallow
ii. T-Aman Rice — Mungbean/ground nut — Fallow
iii. T-Aman Rice — Vegetables — Fallow
iv. T-Aman Rice — Chili — Fallow
v. T-Aman Rice — Fallow — Aush Rice
vi. T-Aman Rice — Pulse/Oilseeds/Chili — Aush Rice
vii. Betel leaf/Banana (Year round)

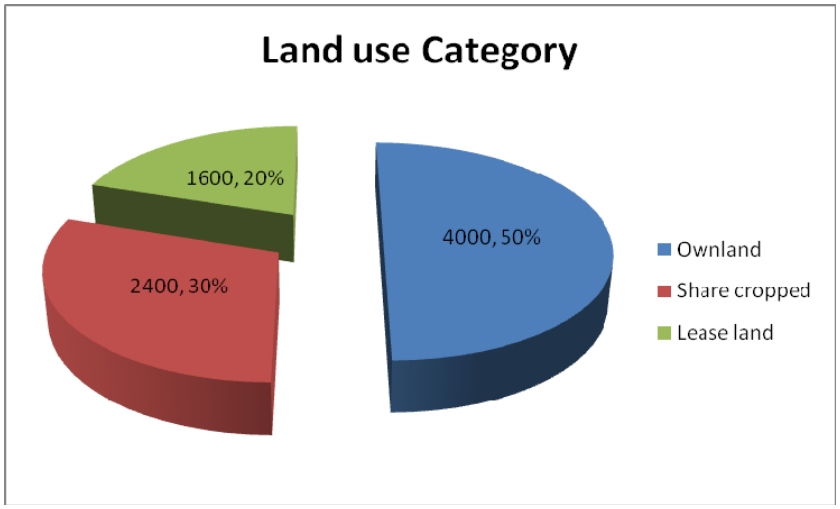
6.1.2 Technologies and Management practices for crop cultivation

In the polder 43/2A agriculture has been practiced as improved traditional technologies as well as management practices. Farmers mainly used their own seeds except ground nut and potato. Farmers are not using modern high yielding quality seeds, and not follow the recommended dose of fertilizers and also seed rate. Farmers follow the traditional post harvest activities and processing. The crop production is mainly rainfed only about 1,500 ha of total 3,887 ha land are in under irrigation during dry season. Drainage systems are not well developed thus a remarkable area of land remains under water lagging. So, there is a big scope to improve the agriculture crop production through ensure quality improved seeds, follow recommended management practices and reduce postharvest loses and improve dreainage and irrigation systems.

6.1.3 Land Ownership

Land is one of the most important resources for livelihood of rural people. Agriculture land is most valued to the poorer section of the population. Land ownership plays a vital role to land use and crop production. About total of Farm HHs where 8,000 where 50% cultivate their own land, 30% share croppers, and about 20% lease.

In polder 43/2A land ownership category is 3% HHs owned ≥ 7-10 ha, 25% HHs owned ≥ 4-7 ha, 35% HHs owned ≥1.5-4 ha, 20% HHs owned ≤ 1.5 ha of land and 17% are landless HHs.



6.1.4 Major problems and Prospects

- Water stagnation/drainage congestion
- Low organic contents in the soil
- Irrigation water scarcity during the dry months
- Risk of tidal flood, river erosion and saline water intrusion
- Essential plant nutrient deficiency
- Poor quality and high price of inputs
- Recommended/modern technologies not used
- Poor post harvest practices and loses is high

If could overcome or interments to the problems then there are many scope to improve in agriculture. Glue Gold may take initiative to improve the irrigation systems through improve management of cannels and reexcavate the cannels

and preserve fresh water in that cannels; facilitate to establish good quality/improved seeds supply to the communities and make responsive the service providers to demonstrate modern technologies for crop cultivation.

6.1.5 Agricultural Mechanization

There is a trend for agricultural mechanization in this region. Polder 43/2-A usually uses agri-machineries for tillage, processing, spray of pesticide etc. There are different service providers who are within and outside the polder. Sometime, service come other districts, like Jesore or Khulna (for Hamza). There is a project, namly "Cereal Systems Initiative for South Asia Mechanization and Irrigation (CSISA-MI)" working in this region for agricultural mechanization.

CSISA-MI is working in the southern coastal region and started from 2013. This project is being be implemented in Patuakhali upazila by a partnership between CIMMYT and International Development Enterprises (iDE).

The CSISA-MI initiative will unlock the agricultural productivity of southern Bangladesh by increasing the availability and adoption of resource conserving irrigation equipment, Conservation Agriculture (CA) based crop management practices and the use of scale-appropriate farm machineries.

6.1.6 Factor affecting Agricultural Production

Drainage overcrowding has been reported in all the WMGs of the polder almost same. Diverse problems are shown as a consequent of this poor drainage system. Drainage congestion affects T. Aus at different stages in various degrees. When there is heavy rain in the pre-monsoon period, T. Aus seed-beds are submerged and seedlings are damaged. At its different growing stages also T. Aus is submerged and damaged – fully in medium lowlands and partially in medium/high land.

Shortage of water in most cases means deficiency of irrigation water and that mainly during the dry months of the year. However, it can also occur at other times of the year. Shortage of irrigation water was reported in all most all the WMGs of this polder.

6.1.7 Factors Affecting Crop Production through the year

Item	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rainfall												
Draught												
Tidal surge												
Cold injury												

Source: FGD

6.1.8 Crop Calendar

Crop growing season: Rabi (16Oct-15 March) Kharif-1(16 March-30 June) Kharif-2(1 july-15 Oct)

Month		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Crop Season		**Rabi (Winter)**			**Kharif-1 (Summer)**			**Kharif-2 (Rainy)**			**Rabi**		
1	T Aman (HYV)												
2	Mungbean												
3	Groundnut												
4	Sesame												
5	Cowpea												
6	Vegetables												
7	Fish (Tilapia & Common Carp)												
8	Chili												

Land preparation &Sowing **Vegetative stage** **Riping/Harvesting**

7.0 Fisheries

The Polder has union has a total wet land area of 1276 hectares (Baro Bighai-583 ha and Chato Bighai- 693 ha) of which 240 hectares are under aquaculture (Baro Bighai-125 ha and Chato Bighai- 115 ha). In this polder aqua*culture comprises of* homestead pond fish culture, commercial fish culture. The open water fisheries consist of river, canal and flood plain areas.

7.2 Table-11 List of fry traders and nursery owner at Polder 43/2A

Sl #	Name of VC Actors	Address/Village	Designation	Mobile no.
1	Shahid	Hartohibaria, Chatobighai	Nursery owner cum fry seller	01720691073
2	Abdul Haque Gharami	Hartohibaria, Chatobighai	Nursery owner cum fry seller	
3	Basir Pada	Chatobigha, Chatobighai	Nursery owner cum fry seller	
4	Chan Mian Majhi	Chatobigha, Chatobighai	Nursery owner cum fry seller	
5	Mamun Sharif	MatiBhanga, Chatobighai	Nursery owner cum fry seller	
6	Chitta Ranjan Hawlader	Chatobighai, Chatobighai	Nursery owner cum fry seller	
7	Nasir Pada	Chatobighai, Chatobighai	Nursery owner cum fry seller	
8	Alam Gazi	Purba Matighanga, Chatobighai	Nursery owner cum fry seller	
9	Halim	Etabarhia, Chatobighai	Nursery owner cum fry seller	
10	Wahed Kha	Hartokibaria, Chatobighai	Nursery owner cum fry seller	
11	Wasim Mirza	Hartokibaria, Chatobighai	Nursery owner cum fry seller	
12	Abul Matbar	Purba Matibhanga, Chatobighai	Fry trader	
13	Alomgir Munshi	Purba Matibhanga, Chatobighai	Fry trader	
14	Ruzu Kha	Purba Matibhanga, Chatobighai	Fry trader	
15	Jahangir Sarder	Hartokibaria, Chatobighai	Fry trader	
16	Adil Ahmmed	Purba Titkata	Nursery owner	01733165023

	Habib			
17	Wahab Tahsilder	Purba Titkata	Nursery owner	
18	Altaf Khalifa	Purba Titkata	Nursery owner	01747977814
19	Rafik Hawlader	Dakhin Bighai	Nursery owner	
20	Rarim Bapery	Dakhin Bighai	Nursery owner	
21	Abdul Maded Pada	Purba Titkata	Nursery owner	
22	Jalil Fakir	Paschim Titkata	Fry trader	
23	Anwar Hossen	Dakhin Bighai	Fry trader	
24	Habib Khandaker	Madhya Titkata	Fry trader	

8.0 Livestock and Poultry

Traditionally, men consider 'heads of households', and in charge of crop production, rearing animals, and ultimately responsible for selling their produce at market. Men control profits and responsible for buying the family's food. Women stay at home, their agricultural and caring work is largely invisible, and they do not have the opportunity or support to realize their aspirations. Women have little access to education especially in poor families and are given a subsidiary status as economic dependents. Women are among the poorest of the rural poor, especially when they are the heads of their households, such as widows or wives of men who migrate in search of employment. They suffer discrimination because of their gender, they have scarce income-earning opportunities and their nutritional intake is often inadequate.

In the coastal parts, duck rearing is a common household level activity of farmers. This is primarily due to easy access to water bodies by the duck farmers which encourage them to go for large scale farming.

There is a possibility of improvement in rural income distribution with an increase in investment for indigenous livestock and poultry development particularly in duck rearing. In polder 43/2A it was observed HHs rear duck more or less. Natural resources like rivers, canals, ponds and water bodies are supportive this regard with natural feeds. The majority of households at this polder rear ducks. Almost all the households hatch eggs and rear chicks of marketable size, i.e. 0.8-1.2 kg. Market opportunities in polder 43/2A (Patuakhali sadar). There are about 100 paikers (traders) in Patuakhali sadar who buy poultry birds and eggs from farmers at Tk. 165 (on average) and sell to two arotdars (big traders) in Patuakhali at Tk. 180. The three main problems facing poultry producers are unavailability of medicine, the absence of vaccinators, and cold-related diseases.

8.1 Some statistics on livestock at Patuakhali sadar

Table-12: Statistics of livestock and poultry at patuakhali sadar upzilla

Types of livestock and poultry	Number
Number of cows	101685
No of buffalo	15588
No of goat	35135
No of ram	560
No of duck	270520
No of hen	720255
Others	1560

Source: District livestock office, Patuakhali

Table-13: Farm number at Patuakhali sadar upzilla FY 2011-2012

Cow		Goat		Ram		Duck		Layer		Broiler		Cattle fattening	
Registered	Unregistered	Registered	Unregistered	Registered	Unregistered	Registered	Unregistered	Registered	Unregistered	Registered	Unregistered	Registered	Unregistered
94	15	10	5	8	5	2	25	33	10	178	75	0	0

Source: District livestock office, Patuakhali

Table-14: Egg production (In corer) statistics at Patuakhali Sadar upzilla FY 2011-2012

Target	2
Achievement	1.45
%	72%

Source: District livestock office, Patuakhali

Table-15: Meat production statistics at Patuakhali upzilla FY 2011-2012 (In lakh MT)

Target	0.04
Achievement	0.008
%	21%

Source: District livestock office, Patuakhali

Table-16: Vaccination of cattle at Patuakhali Sadar upzilla FY 2011-2012

Target	45000
Achievement	20424
%	45%

Source: District livestock office, Patuakhali

Table-17: Vaccination of poultry at Patuakhali Sadar upzilla FY 2011-2012

Target	1300000
Achievement	494900
%	38%

Source: District livestock office, Patuakhali

Table-18: Treatment of cattle at Patuakhali Sadar upzilla FY 2011-2012

Target	13125
Achievement	13885
%	105%

Source: District livestock office, Patuakhali

Table-19: Treatment of poultry at Patuakhali Sadar upzilla FY 2011-2012

Target	70000
Achievement	74515
%	106%

Source: District livestock office, Patuakhali

Table-20: Establishment of farm at Patuakhali sadar upzilla

	Cow	Goat	Ram	Poultry	Duck	Permanent fodder nurtury campus	Seasonal fodder nurtury campus
Target	15	32	6	20	40	0.03 Acre	1.1o Acre
Achievement	12	38	6	18	23	0.10 Acre	0.05 Acre
%	80	118.75	100	90	57	333	4%

Source: District livestock office, Patuakhali

Table-21: HHs having livestock and poultry at polder 43/2A

Livestock/Poultry	Average number	HH (%)of the community
Cattle	3-4	70
Goat/Sheep	3	22
Poultry birds (Hen)	10	90
Duck	10	80

Source: FGD at community

8.2 Inputs supply situation of duck

The inputs supply situation has been discussed in this section. There are many actors involved with this supply system. They are discussed in below.

8.2.1 Source of inputs

Duck farmers in this area mainly source eggs for duck farming. This is due to lack of hatcheries and duckling traders in the areas.

8.2.2 Hatcheries

It was found that total absence of hatchery operation in Patuakhali and Barguna District. If sourced, traders need to go to Khulna, Dhaka, Netrokona to collect ducklings. This results in higher operational cost discouraging to procure ducklings.

8.2.3 Feed Sellers

There are no formal feed sellers inside the polder. The number of informal feed sellers is also fewer in polder area. There are 12 number of feed sellers at Patuakhali sadar upazilla. If requirement for large amount of feed like NGSo subsidies to HHs, GOs relief/distribution activities then they outsource from different markets like: Barisal, Khulna, Jessore and Dhaka. Number of feed sellers at surroundings of polder 43/2A and 43/2F has given table below:

Table-22: No of feed sellers at surroundings of polder 43/2A

	Patuakhali sadar
No of feed sellers	12
Monthly trading volume	182,000 BDT

N.B: Business volumes are shown for 3 months January, February and March

8.2.4 Medicine Suppliers

Private pharmaceutical companies have supply operations in District and Upzailla headquarters level. These companies selling their products to their authorized distributors and retailers, company representatives also working at District and upzilla headquarter level which does not cater the need for duck famers at the inside villages of polder.

8.2.5 List of Companies selling medicine at the District and upzilla level:

Renata limited. Novarties Ltd., ACI godrej, Square, Techno, Globe agro products, FnF, Popular, and ACME

8.2.6 Women participation in Duck rearing

8.2.6.1 Input purchase

Women are generally forbidden to go markets for purchasing inputs for ducks rather the task is mostly carried out by the male members of the family. Exception is found in two cases – 1) women who do not have males in their households move to market place and 2) husbands are engaged in other labor works encourage female households to occupy inputs for ducks.

8.2.6.2 Feed collection

Involvement in duck value chain for women starts with feed collection – majorly snail collection.

8.2.6.3 Feed preparation

Household women take more or less 1 hour 20 minutes from 24 hours to prepare feed for the ducks. This timetable is applicable if the ducks are being fed four times a day; means women spend thereabouts 20 minutes in duck feed preparation.

8.2.6.4 Feeding

Feeding on the other hand takes 30 minutes each time. During feeding, female households ensure proper feeding of duck observing from a nearest place. A total two hours is spent to feed ducks four times a day.

8.2.6.5 Taking ducklings to water bodies

Women take ducklings to water bodies twice a day in summer and once in winter. This is to make them familiar with semi-scavenging feeding system and also to ensure that ducklings do not get lost from the site. The task takes more or less 15 minutes to be completed.

8.2.6.6 Egg Collection

It is the household women who also take care of collecting the eggs every morning, cleaning the eggs and setting the eggs in a basket or bowl filled with rice to keep them safe (unbroken) and fresh for later sales. The process of egg collection and storing takes by females each time.

8.2.6.7 Egg Trading

It was mentioned earlier, women are discouraged to go to market places for trading of eggs or even the ducks. In the polder area, egg collectors are the immediate sales contact for women who visit door to door, collect eggs, and pay the price accordingly. Trading of sales takes place at duck producers' end where women take the lead in maximum time to make the transaction.

8.3 Marketing channels of eggs

The egg marketing system inside polder is traditional and is done mainly by the different intermediaries. The principal sources of eggs in the polder are the local producers. Eggs are generally sold in the weekly rural and peri-urban markets from stocks intended for urban consumption. They are handled by a number of middlemen before reaching the consumers. Different marketing channels are present in the process of egg marketing in the polder as well as the District. These channels are shown in Figure below.

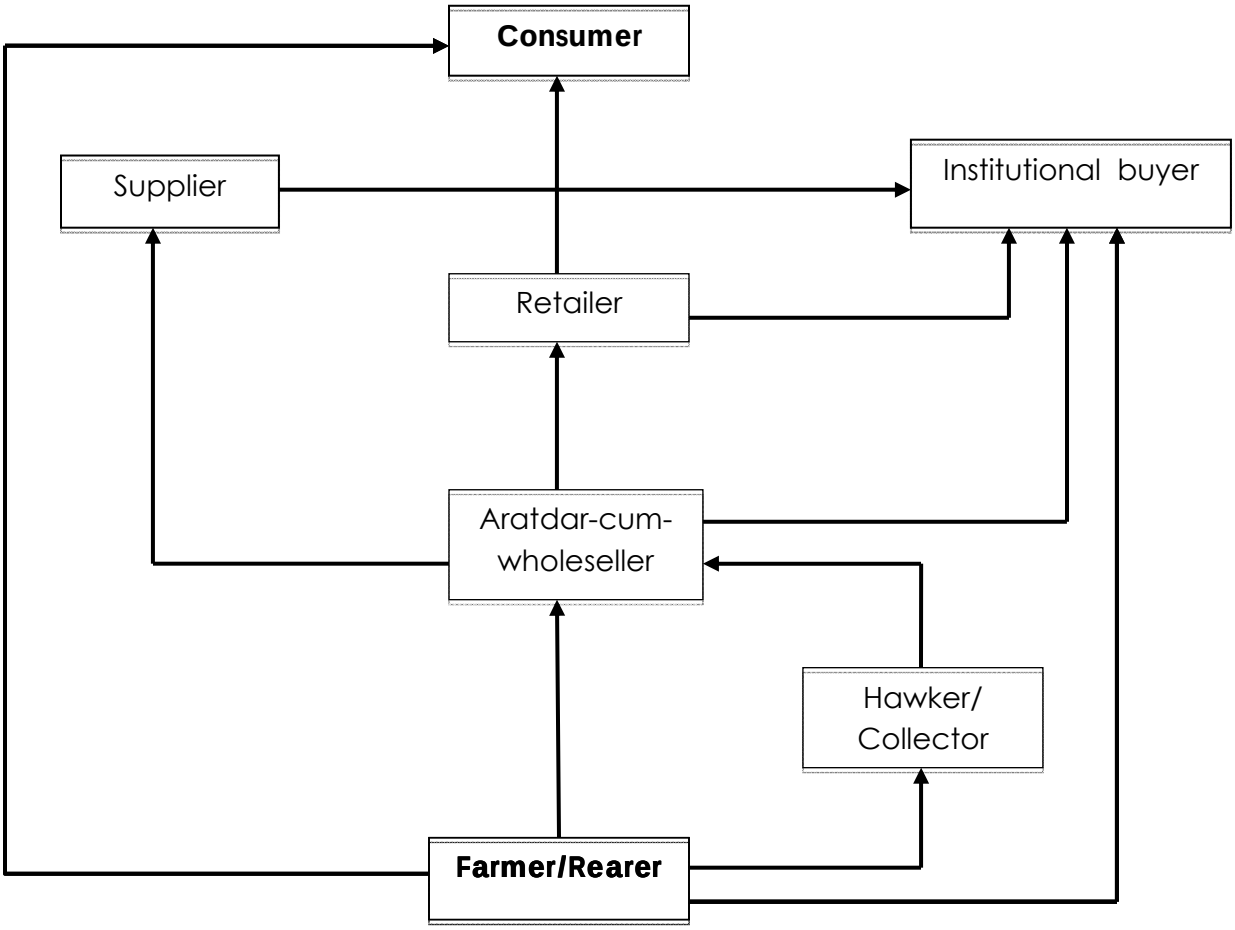


Fig: Marketing Channel of native eggs

On the basis of figure the following channels can be identified.

Channel-1: Farmer ⇨ Aratdar-cum-wholesalers ⇨ Retailer ⇨ Consumers

Channel-2: Farmer ⇨ Aratdar-cum-wholesalers ⇨ Supplier ⇨ Institutional buyer (Hotel, restaurant)

Channel-3: Farmer ⇨ Aratdar-cum-wholesalers ⇨ Institutional buyer (Hotel, restaurant)

Channel-4: Farmer ⇨ Aratdar-cum-wholesalers ⇨ Retailer ⇨ Institutional buyer (Hotel, restaurant)

Channel-5: Farmer ⇨ Institutional buyer (Hotel, restaurant)

Channel-6: Farmer ⇨ Hawker ⇨ Aratdar ⇨ Retailer ⇨ Consumers

Channel-7: Farmer ⇨ Consumers

8.4 Egg collectors

Egg collectors in southern coastal areas enjoy limited return on investment than that of the other part of Bangladesh like Haor area (Sunamgonj, Kishoregonj etc) collectors. Farmer's selling price of an egg is between BDT 7.50 and 8.00 which is sold at BDT 9.00 at the local markets (to retailers or in grocery shops or to large traders).

GMark Consulting limited conducted a study in 2013 on Duck value chain analysis in Haor and coastal areas of Bangladesh and they are showing egg collectors scenario in coastal area table below:

	Patuakhali
No. of egg collectors	30
Monthly trading volume (Unit)	800,000
Monthly trading volume (BDT)	640,000

8.5 Wholesalers

Wholesalers procure eggs only from the collectors to sell at retailers' end. The number of wholesalers is limited in the Southern coastal belt and most of them bring eggs from outside of the region as its production is lower than the demand.

9.0 Gender Perspective of the Polder 43/2A

Photo: FGD with Female group

The polder 43/2A is a moderately conservative and paternal social structure and institutes. In this situation women are not allowed to work in outside of their houses all the cases. Thus the women participation in the economic activities is limited but they are actively participated in domestic work of the household like poultry rearing, homestead vegetables gardening, goat/cattle rearing, and other home based IGAs also. Moreover that woman actively involves with post harvest activities of agricultural crop. Overall gender situation is women have poor access to knowledge, resources, finance and participating economical activities.

In general, the involvement of women in outside activities is quite limited. Destitute women regularly sell their labour whereas among the women of small farmer households, selling labour is more of an occasional activity. Destitute women earn money by carryingout different activities outside the home, including agriculture, craft making, petty business, and earth work and as housemaids.

10.0 Market infrastructures and Information

There are about 9 local markets/hats in the polder 43/2A and where the dwellers of this polder generally do their marketing and shopping activities. Market information is in below:

Table-23: List market in polder 43/2A

Polder	Union	Name of Market	Market/Hat day	Remarks
43/2A	Chato bighai	Chato bighai officer hat	Friday	
		Matighanga hat	Every day Morning	
		Kazirhat	Monday	
		Bhutumiar Bazaar	Every day Evening	
		Tuskhali Bazaar	Saturday	
	Baro Bighai	Khatasia Bazaar	Wednesday	
		Titkata bazaar	Every day evening	
		Baro Bighai offiser hat	Thursday	
	Madarbunia	Nandipara Brizghat	Sunday	

10.1 Table-24: Information of some major Input traders of those markets (Agricultural related)

SL #	Name of Traders	Mobile No.	Place of Business	Inputs	Collect inputs from	Yearly Turnover (Tk.)	Peak season	Dull season
1.	Md. Jahangir Howlader	01711219875	Coto beghai Officer hat	Urea, T.S.P, M.P, Pesticides	Patuakhali	About 6 lac	July to Sep.	April to June
2.	Abdul Hai	01754017195	Kazir hat	Urea, T.S.P, pesticides	Patuakhali	About 4 lac	Do	Do
3.	Md. Jakir Matber	01726861018	Bhuutumia hat	Urea, T.S.P, pesticides	Patuakhali	About 3 lac	Do	Do
4.	Md. Belayet Hossain	01735521131	Mativanga hat	Do	Do	About 2 lac	Do	Do
5.	Md. Salim Pahloan	01726453231	Khatasia hat	Urea, T.S.P, M.P, pesticides, oil cake, fish meal, wheat bran	Do	About 40 lac	Do	Do
6.	Abu Taleb mia	01735628488	Bara Behgai Officer hat	Urea, T.S.P Pesticides, Oil cake, wheat bran	Do	About 6 lac	Do	Do
7.	Md. Satter how	01713357693	Puler hat	do	Do	About 5 lac	Do	Do
8.	Md. Babul how.	01713962897	Coto beghai officer hat	Fish meal, oil cake, wheat bran, poultry feed	Do	About 6 lac	Do	Do
9.	Md. Lal mia how.	01721597865	Officer hat	Poultry feed, Fish meal, oil cake, wheat bran	Do	About 4 lac	Do	Do
10.	Md. Amzad Palowan	01720987136	Bara Behgai Officer hat	Fertilizers & Pesticides Dealer	Do	About 12 lac	Do	Do

Kazirhat of Chato bighai union and Khatasia bazaar is the largest bazaar in this polder considering transaction and market infrastructure. Bazaar day is Monday for Kazir hat and Wednesday for Khatasia Bazaar.

10. 2 Market products

- Mug bean, Sesame, groundnut, Keshari, chili, and rice are the main market products of this polder
- Sesame and Keshari usually goes to North-west of Bangladesh where these are being processed. Off course the informants don't know the actual flow chart of the products

Photo: KII to the market actor

- Different private sector companies (PRAN) buy peanut and Mug bean but the Companies don't buy directly from the farmers or local hat. Generally Bapari collect groundnut and Mug bean from local Bazaar or from the farm gate. When they get a bulk volume of peanut/mungbean to Track capacity then they marketing this directly in Barisal where stay some agents who collect this and then Agents or Agency supply it to the company. Farmers have no idea about the rate of the company or any required specification. Sometime Bapari directly supply to the company.

Flow diagram-1: Market flow Chart of grpundnut and Mungbean/Kheshari

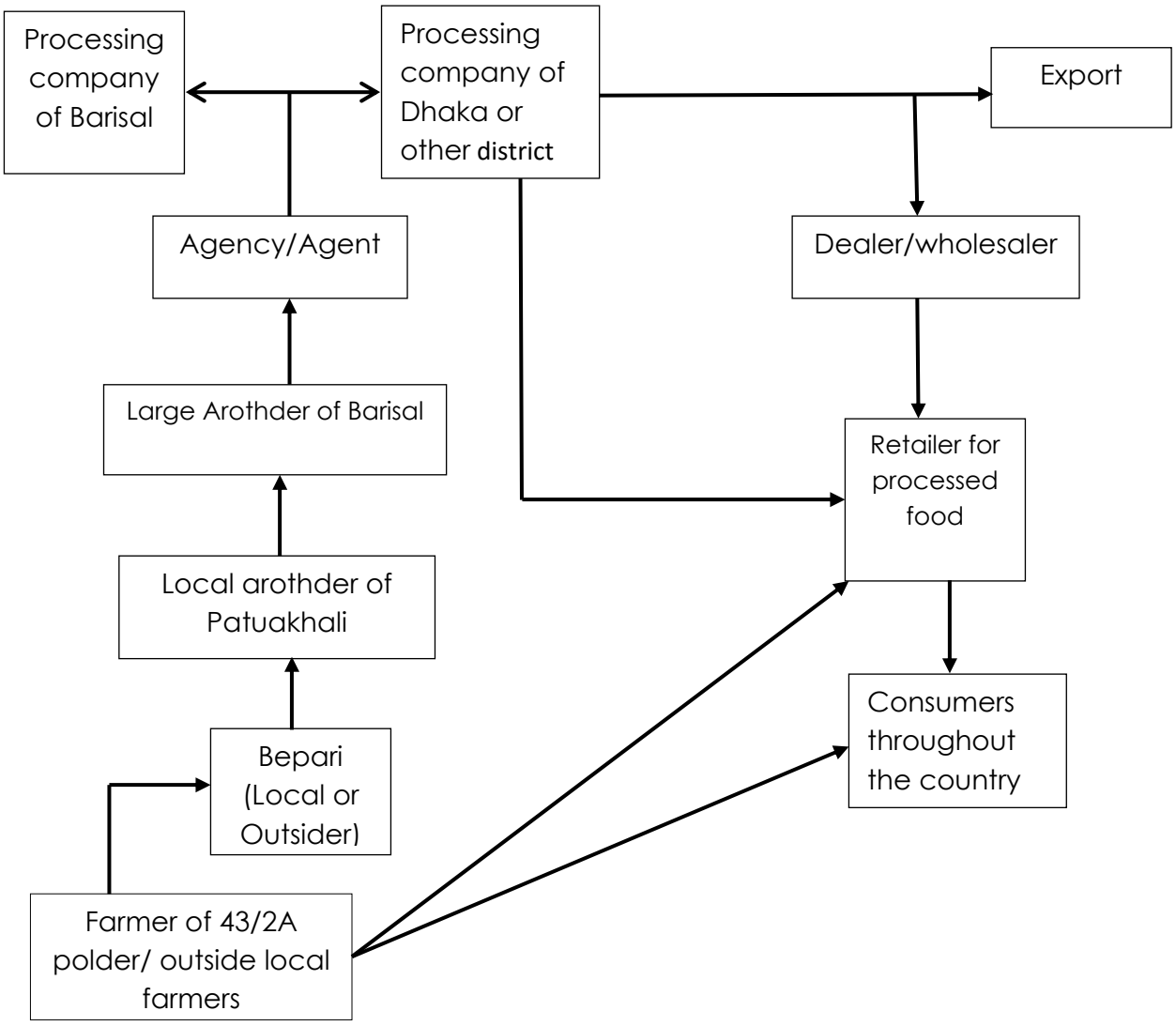


Fig: Flow chart of Mungbean

10-3 : Output market situation analysis

Usually farmers bring their produces as small quantity to the local market (hat) for selling at hat day for selling. Sometimes local foria or bepari goes to the farm gate but they offer low prices than the hat/market i.e. Foria mainly come in the polder mainly to buy paddy, mung bean, peanut, kheshari. But poor road communication especially during monsoon there is no transport to go to market and this why farmers have to carry goods by human heads or shoulders roughly from 2/3 Km, and then onwards to Patuakhali by riskshaw/Auto. Bepari and whole seller are mostly doing their business from Patuakhali and khatashia hat

(Joy bangle bazaar). Sometimes farmers sell their product in credit to the local bapari in title bit higher price but they do not fall in any harassment to get payment. A small number of farmers store their produces in their own facilities for short time. Besides this most of the farmers have to sellout their produces just after their harvesting due to repay the loans, meet up the family expenditure and inputs bought on credits.

The simplest link between production and consumption is during when farmers sell their own products directly in a market. The relationships among market actors like -producers, traders, wholesalers, and retailers play an important role in the marketing of products. Such linkages can create mutual trust amongst different functionaries in the marketing system. However this may also cause a dependency relationship between parties and make it difficult for newcomers to enter the marketing process. Linkages are often based on village proximity (area based) or on social relationships build over many years. In terms of linking producers with consumers, market intermediaries play of crucial role. The most common intermediaries in the Blue Gold working areas are:

Intermediaries	Functions
Arotder	Arotder is one kind of wholesaler or commissioning agent or like as piker who buy product from the farias and sell to Mukam in Dhaka or Godi Businessmen in locality and some of them started to sell their product directly to the processing center
Bepari	Bepari is located in the second tier of the local business chains. Bepari buy product from the faria and farmers. Most of the products they buy from the faria. They give cash to the faria for buy product from the grassroots level. Locally they are called big businessmen; they sell their products to the piker
Piker	They are small scale wholesalers who collect products from small markets and send them to big markets, or sell in or through nearby arot.
Faria	These are small traders or commissioning agents who are localized and whose mobility is limited up to 1 or 2 Upazilla. They buy directly from farmers and sell to other traders to the local markets. Sometimes they act as the commissioning agent for other larger traders to procure the products. They are mostly small-scale seasonal floating traders and some also combine farming with trading.
Dadonder	Dadonder is the person who provides credit to the smallholders in the rural area with high interest.
Dealer	Dealers are licensed agent of seller of seed or fertilizer.
Retailer	They sell inputs to the farmers

10.4 Linkage between Producers and Intermediary

Some large producers are simultaneously selling produces directly in Patuakhali and Khatasia wholesale market and to the Paikar/Foria at their farm gate. In case of vegetables Paikar/Foria is not interested to receive at the farm gate due unavailability of expected volume of vegetables from the producers on time; primarily due to inadequate production volume and limited number of commercial producers.

- ⇨ The farmers who produce commercially are linked with the OMAs as well as market due to the large volume of production
- ⇨ Producer/paikar can sell their products directly to the consumers in local markets. There are no barriers from the existing sellers and MMC for selling their produce.
- ⇨ Small producers who do not produce commercially are not linked with the OMAs as their volume of production is less and maximum producers are this type that's why wholesale market is not available and local paika/bepari/vegetable sellers buy (mostly) directly from outside of the polder and sell to local consumers
- ⇨ Rural producers do not have many options as IMAs are not selling different products or from different companies, hence limiting diversity.

10.5 Linkage between Rural Producers and Urban Sellers

Commercial producers, although their number is small are effectively linked with the rural and urban sellers because they work intensively for vegetables production. Their intension is to sell produced products quickly and get back to their farm activities. Due to poor production volume huge numbers of farmers are not linked with urban sellers and are generally selling by self in the local market.

Urban sellers are buying vegetables from existing marketing channel/supply chain i.e. wholesale market (upazilla wholesale market). As the urban sellers buy products through different channels, they are investing a huge amount of time and paying more for transportation cost. Less volume of vegetables aggregation at certain place is the main reason for the urban sellers' low interest for buying vegetable from rural producers. Most transactions are occurred in cash but credit transaction also prevails depending upon the relation with customers.

10.6 Linkage between Rural Homestead Producers and Urban Consumers

Rural homestead producers, closer to urban periphery especially in polder 43/2A are linked with the Patuakhali sadar consumers directly. After self-consumption, they travel to nearer urban or rural markets and sell their produced products directly to the consumers. Homestead producers generally fulfill their consumption demand on their own unlike urban consumers who depend on the market for their consumption.

10.7 Linkage between Rural Producers and Input Sellers

Input sellers in rural areas do not sell products from many companies and different verities of vegetable seeds. So, producers have less option to choose; rather they buy available ones whatever may be its quality. IMAs provide credit to their trusted customers (producer) to maintain business relation. There appears a monopoly of input suppliers due to limited number, hence there is a need to strengthen input supply and ensure availability of quality inputs at retailer level as per producers' demand.

10.8 Product wise market map/value chain map

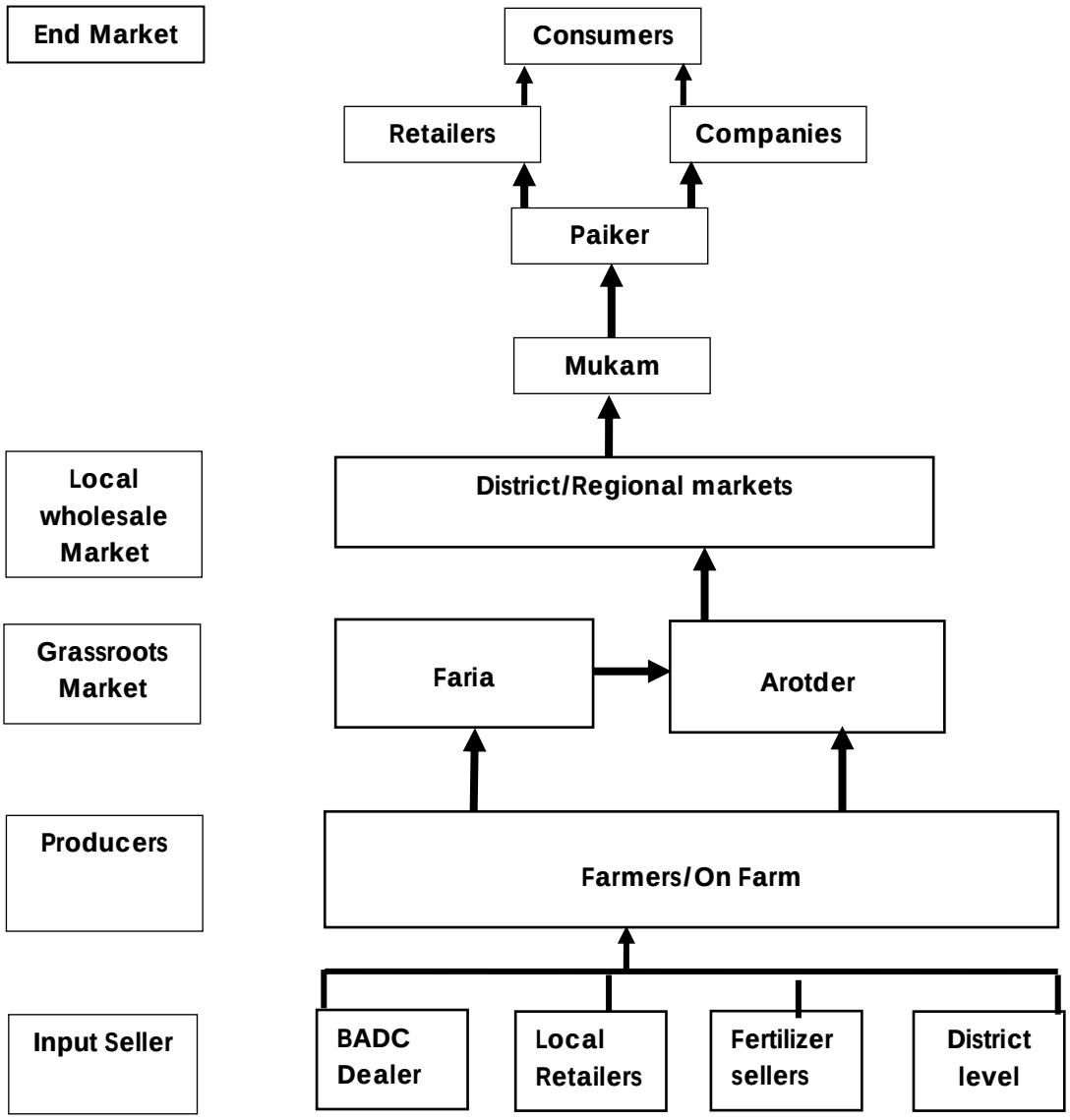


Fig: General Value chain mapof Agricultural products at Polder 43/2A

11.0 Potential Value Chain

In this section discussed some potential value chain for the polder 43/2A.

11.1 Mung bean Value Chain

About 70 percent of mung bean production is concentrated in the four southern districts of Patuakhali, Barisal, Bhola, and Noakhali. Patuakhali alone accounts for 30 percent of the area in which mung bean is grown.

11.1.1 Production

The area and production of most pulses have continuously declined over the last ten years in Bangladesh. The total area under pulses reduced from 728 thousand ha in 1990-91 to 604 thousand ha in 2004-2005, but production remained static, around 525 thousand tons due to increase in productivity. The main reasons for decline is the expansion of irrigation facilities and crop competition in winter season (mainly rice, wheat, maize, potato, vegetables) as well as instability of pulses yield due to various biotic and biotic stresses.

Photo: KII to the experienced Farmer

Bangladesh farmers produce nearly a dozen of pulse crops; but their yield and potential production vary enormously between species and across locations. All pulse crops suffer due to increasingly extensive culture of rice, wheat and maize crop. Crop like lentil and chickpea registered steady growth last few years. With the increase of cereal production, mungbean production showed a promise and increasing trend due to availability of improved variety suitable for incorporation in the existing cropping pattern without any major change in the system.

11.1.2 Low productivity

Productivity of pulses in Bangladesh is low and unstable compared to that of wheat or rice. Traditional farmer's varieties or local varieties are inherently low yielding types, susceptible to disease and insect pest, less branching, low podding intensity, very small seed size. The average production of rice is 4.0 t/ha, wheat 5.0 t/ha. Whereas production of Lentil 0.8 t/ha, mungbean 1.2 t/ha.

Table-25: Comparative productivity of pulses and cereal crops

Rice	Wheat	Lentil	Mungbean
4.0 t/ ha	5.0 t/ha	0.8 t/ ha	1.2 t/ ha

The major constraints on productivity are that pulses in general have genetically low yield potential—particularly the indigenous varieties of pulses due to the following:

- The indigenous varieties of pulses are sensitive to too much water and fertilizer and often show negative response to these factors
- These varieties have more disease and pest problems than cereals do
- The varieties are more sensitive to climatic factors such as excess soil moisture, humidity and rainfall, terminal heat stress, and soil factors, when compared with cereals; and
- Pulse crops receive little attention from farmers with respect to adequate land preparation, fertilization, timely sowing, weeding, and plant protection.

11.1.3 Inappropriate management

It is built in farmer's mind that the pulse crops including mung bean can be grown with less care. So they put more effort on major crops like rice, wheat, vegetable and give little effort on pulse cultivation.

On the other hand, farmers suffer from lack of access to appropriate seed production and post- harvest technologies, marketing systems, and credit facilities. Also, research and extension are poorly linked.

11.1.4 Improper cropping pattern

Winter duration in Bangladesh is very short (100-110 days). Farmers do not sow mungbean at optimum time. Therefore, this crop have even shorter period for vegetative growth resulting in poor yield. Farmers usually sow Mungbean after harvesting of Wheat, Potato, Lentil, Oilseed, vegetables etc. Late harvesting of these crops causes late sowing of Mungbean.

11.1.5 Production trend increasing of Mung bean

Cultivation of mung bean is more prominent and production is very strong in Patuakhali. In case of late Aman farmers are better off producing mung as it is short duration and the season is appropriate for marketing mung beans. Given this, cultivation of mung has spurred in this area as farmers have increasingly shifted from producing kheshari to producing mung.

11.1.6 Opportunity to increase productivity and profitability

Photo: FGD with the experienced farmers

A farmer usually receives 3-4 kg of mung per decimal while they reported that the maximum production that can achieve is 8 kg per decimal. Productivity has gone down significantly due to increasing pest attack and use of low yielding varieties. Pest attack has increased in recent times mostly due to erratic rain fall. But the major reason is that the farmers are not aware of proper pest management techniques. BARI mung supposedly yields higher and is pest resistant. But the seeds are not available in the local market.

Table-26: Cost of Production: Mung (1 ac land)

Cost Item	Amount	Cost (in BDT)
Ploughing	3 ploughs	2000
Seed	27 kg	2160
Fertilizer	30 kg	1500
Medicine & Insecticide	7 bottles	3000
Labor	20 labor days	2000
Total Production cost		**10660**

Table-27: Productivity of Mung- Current and Potential (in1decimal land)

Current (kg/ decimal)	Potential (with intervention) (kg/ decimal)
3-4	8

11.1.7 Production of better varieties

BARI Mung 2, 3 and 4 are better yielding and pest resistant. However, only 30-40% of the mung bean farmers in the polder are cultivating BARI varieties. It has been noted that the varieties are not widely available. Since the distribution of pulse seeds are taken care of by government agencies partnership with DAE is solicited to ensure supply and availability of the seeds in the project region.

11.1. 8 Grading/ Processing

Properly cleaned, graded dried mung bean yield TK 70-80 more per kg than semi dried ones.

11.1.9 Bulk sales and direct access to processor

Farmers mostly sell of mung bean harvested in two to three cycles. Therefore, farmers hardly can access directly to the processor and there are significant numbers of processors in the middle. Following table summarizes the prices at different levels:

Table: Comparative Price at Different Levels (TK/ kg)

Crop	Price at farm gate	Faria	Arot
Mung Bean	TK 55/-60	TK 62-65	TK 65/70

11.1.10 Problems with the forward linkages (Access to market)

Presence of a strong number of middlemen reduces price at the farm gate

The pulse and oil crops value chains have presence of a strong number of middlemen. This erodes the price at the farm gate as has been shown in Table. The growth in number of middlemen can be attributed to the following:

Weak local transportation network

Transportation is a huge challenge in the whole project region. The wholesale markets are disconnected from the producers by river channels and poor roads. This increases transportation cost and increases risk of wastage during transportation. The middlemen transfer value to the farmers by reducing transportation cost and creating access to the market or the customers.

Absence of farmer's cooperatives

Until recently farmer's cooperatives exclusively for bulk production and marketing were not present in the project area. RFLDC-DANIDA had created community based organizations (CBOs) which has the potential to work as farmer's cooperatives. But till now organized marketing from the farmer's end is not an initiative that could be traced. Currently DANIDA funded project named integrated farm management component **(IFMC)** implementing piloting **"Farmers business school (FBS)"** at polder 43/2A in Auliapur Union and Marichbunia Union.

11.1.11 Lack of local processing facilities

There are only two large scale pulse crushing mills in Barisal. Pulses and oil crops produced in the project region are sold to arots in Patuakhali Puran Bazar, Kalapara and bulking volume then transported to kathpatti in Munshiganj, Narayanganj and chandpur. This is mostly due to the fact that the arots in these districts act as the link between the buyers at national level and the producers around the country. The feasibility for crushing pulses at local level and marketing across the country is not tested. There are a few small scale poultry and fish feed manufacturer in Patuakhali and Barisal but the number is not large enough to increase scope for local value addition. Lack of local processing facilities has weakened the scope of value addition at local level.

11.1.12 Problems with the backward linkages (Access to inputs)

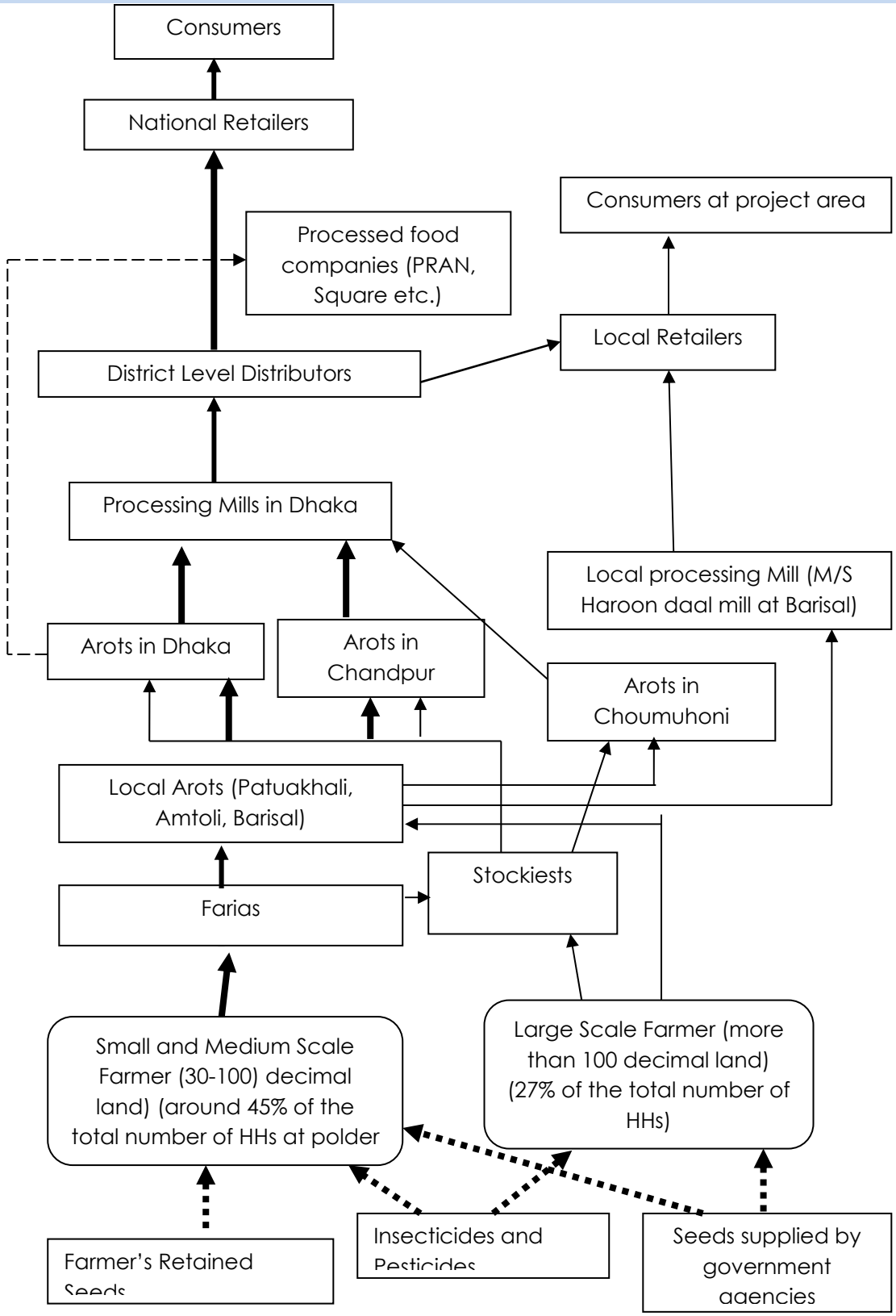
Weak seed distribution and marketing operations

Farmers' in the project area uses retain seeds and have the perception that the seeds used by them are of good quality. However, high yielding varieties like BARI Mung are not available in the polder area. Not all farmers have even heard of such varieties. Given that mung bean seeds are supplied by the government it is important that a functional network for seeds distribution is in operations in collaboration between the department of agricultural extension, seeds retailers and NGOs active in the project region.

Weak promotion of information on pesticide and insecticide management

Pulses crops, particularly mung bean and soyabean are highly susceptible to diseases. Farmers are found using insecticide and pesticide violently without any formal knowledge or training. For instance, farmers are found using pesticide after flowering when the recommendation is to use pesticide before flowering. Moreover, farmers are found using pesticide in the noon but the recommendation is to use pesticide in the early morning and evening when the pests are out. IPM practices are not found by the farmers. Seed companies have active marketing and sales forces in the district headquarter and Upazilla level, their distribution networks at union and village level is not significant and are not found active in promoting appropriate methods of pest and insect management.

11.1.12 Flow chart: Pulse (Mung bean) Value Chain



Note: The heavier arrows represent the strongest links. The dashed arrows represent links that require intervention.

11.1.13 Service market

Transacted Business Development Services

There are no transacted services subscribed to by the farmers. Information is also thought to be public goods by the farmers. There is no scope to promote transacted extension services to the farmers. However, farmers are looking for information on current market price which can help them decide on which market to sell to. Since, most of the farmers have access to mobile phones and community information centers (CIC) by Grameen Phone, Call center by Bangla Link are being widely marketed by the mobile phone operators.

Embedded business services

Pulse crops are vulnerable to pests and insects. Most of the insecticide and pesticide manufacturing and marketing companies like Bayer crop science, Syngenta and ACI have their operations in the project area. Given the market demand for insecticide and pesticides collaboration could be done with these companies to promote appropriate insecticide and pesticide management techniques and with BARI, BADC, Department for agricultural Extensions (DAE) and such other government agencies to promote better yielding and pest resistant varieties.

Processed food companies like PRAN, Square and BD should be approached to determine the potential for contract farming for mung beans and plain daals from the project region. This will lead to significant growth and development of the crops in the project region.

Local poultry and fish feed manufacturers should also be approached to promote better yielding and pest resistant varieties in the project region.

11.1.14 Some recommendation to increase production of mung bean at polder 43/2A

- Creating access to BARI MUNG 5, 6 through collaboration with BADC, input marketing companies
- Improved knowledge and promotion of IPM through insecticide and pesticide marketing companies
- Organizing demonstration plots under FFS.
- Organizing demonstration plots through insecticide and pesticide marketing companies.

12.0 Tilapia-Value Chain

Tilapia was introduced to Bangladesh from Thailand in 1954. In spite of long history, tilapia culture has become widespread in Bangladesh in recent years. Tilapia is ranked 6th in terms of pond fish production which contributes 8.1% of total aquaculture production. A total of around 201,000 farmers are involved in tilapia culture. It is projected that the number of tilapia farmers would be around 330,000 in 2016-17. As tilapia culture is possible in a wide range of freshwater and salinity conditions, thus the total tilapia producing area has been increased from 52,694 ha in 2008-09 to 130,057 ha in 2010-11. It is projected that the tilapia culture area will reach at around 330,000 ha in 2016-17 including ponds, *ghers* and floodplains. Tilapia is produced in a wide range of culture systems, including small-scale, low-input, rural ponds, semi-intensive, intensive and commercial operations. Most farmers (70%) produce tilapia under polyculture while the remainder (30%) practice in monoculture. Around 30% of farmers are involved in extensive/improved-extensive farming, while 50% and 20% of farmers practice semi-extensive and intensive farming, respectively. The total annual tilapia production in Bangladesh was estimated at 177,682 tonnes in 2011-12. It is projected that the total production of tilapia will be reached at around 311,000 tonnes in 2016-17.

With increasing popularity among consumers, tilapia has become the world's second most important cultured fish after carp (ADB, 2005b). There is a long history of tilapia farming in Bangladesh. The Mozambique tilapia (Oreochromismossambicus) was introduced to Bangladesh from Thailand in 1954 (Rahman, 1985). However, this species was not widely accepted for aquaculture because of its early maturation and prolific breeding leading to overcrowded ponds. To overcome this problem the Chitralada strain of Nile tilapia (O. niloticus) was introduced to Bangladesh from Thailand by UNICEF (United Nations International Children's Emergency Fund) in 1974 (ADB, 2005a). Nevertheless, Nile tilapia farming was slow to develop as most farmers remained more interested in carp. Gradually, the red tilapia (hybrid of O. mossambicus x O. niloticus) was imported to Bangladesh from Thailand. The Bangladesh Fisheries Research Institute (BFRI) reintroduced Nile tilapia and Red tilapia from Thailand in 1987 and 1988, respectively (Gupta et al., 1992). Thereafter, Genetically Improved Farmed Tilapia (GIFT) was introduced to Bangladesh by ICLARM (International Centre for Living Aquatic Resources Management, now known as the WorldFish Centre) and BFRI in 1994 (Hussainet al., 2004; Ponzoni et al., 2010). The performance of the GIFT strain was found to be significantly

superior to that of other tilapia in many respects (Hussain et al., 2000; Hussain, 2009). Technology was developed to produce sex-reversed male tilapia (i.e. monosex tilapia), to avoid the unwanted reproduction and benefit from the faster growth rate of males compared to females. Since 2000, interest in tilapia farming has grown because of its observed success in other Asian producers and increasing consumer acceptance both within Bangladesh and internationally (Ahmed, 2009b). In recent years, the culture of tilapia has been progressing well because of consumer acceptance as tilapia is often treated as 'aquatic chicken' in Asia. In respect to different tilapia species, the following sections describe tilapia (Oreochromissp) culture with its production, distribution and marketing activities.

12.1 Production analysis

According to the DoF, tilapia (including nilotica) production in pond of Bangladesh was estimated at 98,758 tonnes in 2010-11 which was 8.1% of total pond production (FRSS, 2012). Nevertheless, considerable variation in production data between DoF and Extension Department was found. According to the Extension Department, the total annual production of tilapia in Bangladesh was estimated at 177,682 tonnes in 2010-11 whereas FRSS data estimated 98,750 tonnes production for the same period. After series of discussions with the Key informants and Industry experts it was concluded that in terms of culture area and productivity per hectare, total tilapia production data by Extension Department is reliable. Over the last three years, total tilapia production in Bangladesh has increased more than twice, from 88,210 tonnes in 2008-09 to 177,682 tonnes in 2010-11 (Table 10). In 2010-11, the highest tilapia production was found in Khunla division (76,686 tonnes), followed by Chittagong (52,163 tonnes) and Dhaka (25,731 tonnes). Over the last three years, tilapia production in Khulna division has increased four times from 18,411 tonnes in 2008-09 to 76,686 tonnes in 2010-11. Nevertheless, the comparative growth rate of tilapia production is slow in other divisions. In 2010-11, the lowest tilapia production was found in Rangpur division (2,182 tonnes), followed by Sylhet (6,211 tonnes), Barisal (7,135 tonnes) and Rajshahi (7,574 tonnes).

12.3 Productivity

The productivity of tilapia per hectare farm is low due to extensive culture. It is also found that the productivity of tilapia is low due to polyculture with other fish which is not considered. The average productivity of tilapia in Bangladesh was estimated at 1.37 tonnes/ha in 2010-11.

The productivity rate (tonne/ha) per hectare farm of tilapia has been gradually increasing in Dhaka, Chittagong, Khulna and Rajshahi divisions. These divisions belong to major tilapia producing areas such as Mymensingh, Comilla, Khulna and Bogra. As tilapia is becoming popular among farmers, it is expected that production rate per hectare will increase over the next few years.

12.4 Culture area

Although 371,309 ha of freshwater ponds in Bangladesh are used for inland aquaculture, there is no accurate data about tilapia culture area (DoF, 2012). Nevertheless, Extension Department has gathered tilapia culture area in Bangladesh. As tilapia culture is possible in a range of freshwater and salinity conditions, thus the total tilapia culture area in Patuakhali region has been increased three times from last thre years past.

Table-28: Division wise tilapia culture area in Bangladesh over the last three years

Division	Culture area (ha)				
	2008-09	2009-10	Annual expansion rate (%)	2010–11	Annual expansion rate (%)
Dhaka	3,376	3,655	8	4,093	12
Chittagong	13,790	14,350	4	14,314	-0.25
Khulna	31,384	38,418	22	105,484	175
Rajshahi	1,051	1,368	30	1,643	20
Sylhet	997	1,214	22	1,326	9
Barisal	**1,248**	**1,397**	**12**	**2,026**	**45**
Rangpur	848	268	-68	1,171	337
Total	**52,694**	**60,670**	**15**	**130,057**	**114**

Source: DoF, Extension Data (2012)

12.5 Culture practice

The main season for tilapia farming is from April to November/December with many farmers beginning the four months production cycle in April/May. Farmers stock their ponds from as early as April/May and harvest tilapia after four months intervals. Due to scarcity of water and cold weather, most farmers usually complete tilapia harvest at the beginning of dry season in November/December. Fish farming in Bangladesh is largely season based where rain water is trapped during monsoon in ponds for aquaculture. Tilapia culture is fully dependent on hatchery produced fry with home-made feed and/or industrially manufactured pellet feed.

Tilapia can be produced in a wide range of culture systems, including small-scale, low-input, rural ponds, semi-intensive, intensive and commercial operations. Tilapia culture is classified as: (1) polyculture and (2) monoculture. Polyculture has long been traditional practiced by fish farmers in rural Bangladesh. Polyculture involves raising two or more species in one pond so that they do not compete for feed and may complement each other's ecological habits. The concept of polyculture is to efficient utilisation of trophic niches of a pond in order to obtain maximum fish production per unit area. On the other hand, monoculture deals only single species aquaculture. According to key informants, a number of entrepreneurs first started tilapia monoculture in the early 2000s. The advantage of monoculture is that it allows high stocking density and thus high production. Although monoculture is a non-diversified farming system, the productivity of fish is often higher than polyculture due to intensive farming. It seems that there is a recent trend from polyculture to monoculture due to increase tilapia productivity.

Comparatively, extensive farmers typically use low level of feed application. Semi-intensive farmers use intermediate level of feed, while intensive farmers use high level of feed input. In general, extensive farmers mainly use supplementary diet consisting of a mixture of locally available feed ingredients as rice bran, wheat bran, oil cake and fish meal. In contrast, farm-made aquafeedsand industrially manufactured pellet feeds are used by farmers in semi-intensive and intensive farming. Nevertheless, there is considerable overlap to use feed in different farming systems.

Table-29: Tilapia farming system

Farming intensity	Description
Extensive	▪ Small farm size (usually less than 0.3 ha) ▪ Usually practice polyculture ▪ Use low level of inputs (seed, feed, fertiliser and labour) ▪ Irregular feeding of fish or feed application once per day ▪ Mainly use organic fertiliser (cow dung), depends on natural feed ▪ Mostly one production cycle ▪ Low fish productivity ▪ Farmers typically face financial constraints (i.e. resource-poor farmers)
Semi-intensive	▪ Medium farm size (typically 0.3–0.7 ha) ▪ Farming practice either monoculture or polyculture ▪ Use intermediate level of inputs (seed, feed, fertiliser and labour) ▪ Regular feeding of fish, usually feed application more than once daily ▪ Apply organic (cow dung) and inorganic (urea and TSP) fertilisers ▪ Involve more than one production cycle ▪ Medium level of fish productivity ▪ Farmers are not resource-poor or have access to financial capital
Intensive	▪ Comparatively large farm size (above 0.7 ha) ▪ Usually practice monoculture ▪ Use high level of inputs (seed, feed, fertiliser and labour) ▪ Regular feeding of fish, usually feed application 2-3 times per day ▪ Mainly use inorganic fertilisers ▪ Involve 2 or 3 production cycles ▪ High level of fish productivity ▪ Better-off farmers, use own financial capital or loan

12.6 Cost-Benefit Structure of Different Culture Practices

The costs of tilapia production relate to the level of inputs, the price of inputs and the culture systems. Production costs are grouped into: (1) variable costs and (2) fixed costs. Variable costs are directly related to the scale of farm operations at any given time. Variable costs in tilapia farming are cost of seed, feed, fertiliser, labour, harvesting and marketing, and miscellaneous costs (e.g. electricity, vitamin premix, medicine and lime). On the other hand, fixed costs include: (1) depreciation cost of water pump, net and feed machine, (2) interest on operating capital or loan and (3) land use cost or lease money.

It was found that the costs of production in all items were higher for intensive farms, compared with semi-intensive and extensive farms.

Table-30: Production cost and return for tilapia farming by culture intensity in 2012

Cost and return item	Cost and return in farming system (Tk/ha/yr)		
	Extensive	Semi-intensive	Intensive
Variable cost (VC)			
Seed	6,000	10,000	15,000
Feed	48,000	110,000	210,000
Fertiliser	3,000	5,000	7,000
Labour (family and hired)	15,000	25,000	48,000
Harvesting and marketing	2,000	3,000	5,000
Miscellaneous	2,000	3,000	5,000
Sub-total	76,000	156,000	290,000
Fixed cost (FC)			
Depreciation	2,000	3,000	6,000
Interest on operating capital/loan	9,000	12,000	15,000
Land use cost or lease	5,000	5,000	5,000
Sub-total	16,000	20,000	26,000
Total cost (TC = VC + FC)	**92,000**	**176,000**	**316,000**
Average productivity (kg/ha/yr) (P)	1,200	2,500	5,000
Average farm-gate price (Tk/kg) (FP)	100	100	100
Gross revenue (GR = P x FP)	120,000	250,000	500,000
Net return (NR = GR - TC)	28,000	74,000	184,000
Benefit-cost ratio (BCR = GR/TC)	**1.30**	**1.42**	**1.58**

12.7 Actors involved in Tilapia Value Chain

In tilapia production, distribution and marketing, a number of actors involve in value chain those are playing key roles in different aspects of value addition.

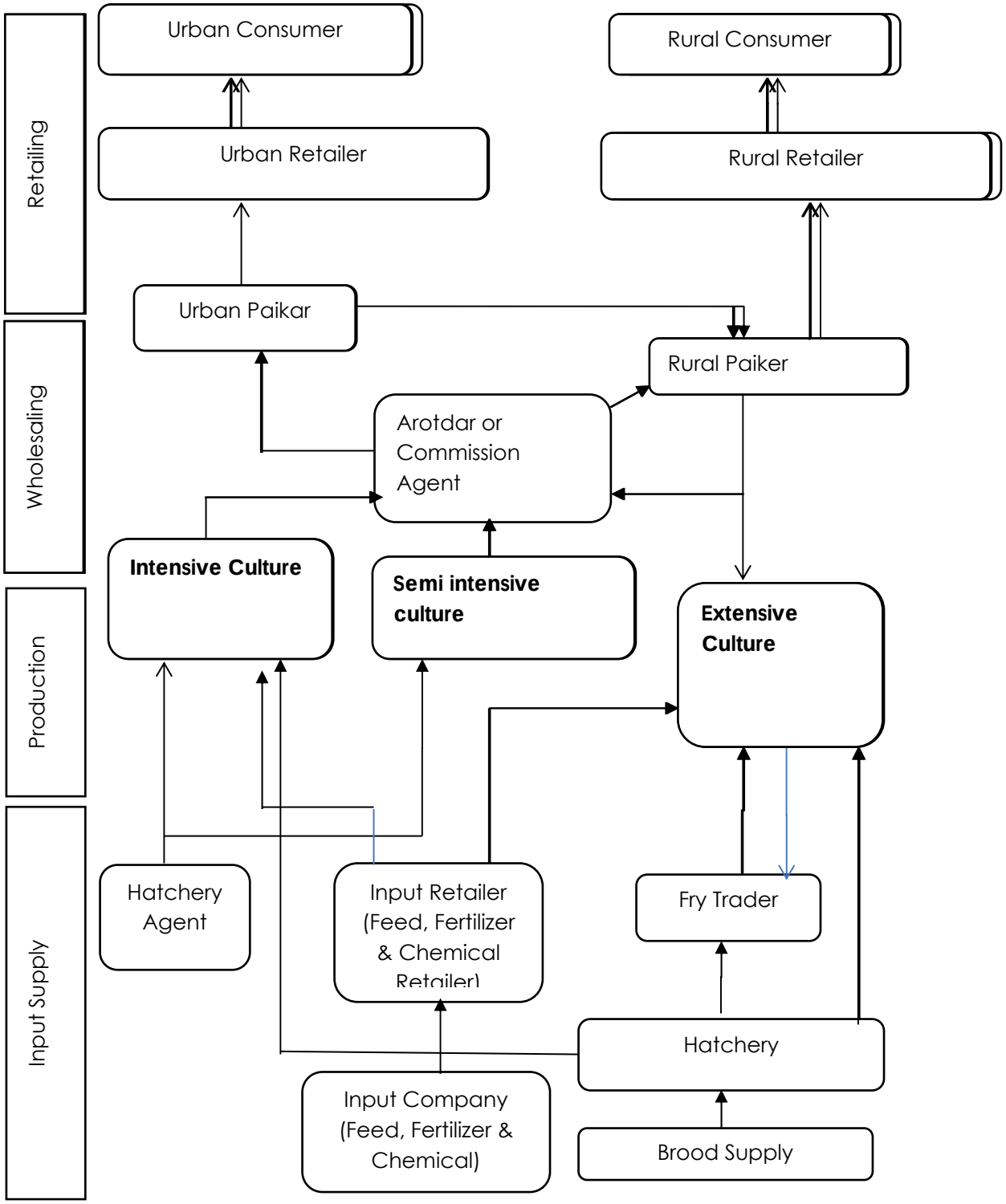
Table-31: Key actors and their roles in tilapia production, distribution and marketing

Actors	Functions	Roles
Hatchery operators	Brood collection and management	Commercial brood supplier is absent in Bangladesh. Hatcheries collect broods from abroad through the connection of development projects. In addition, some

		hatcheries have personal connection with other efficient Tilapia producing countries because of their involvement in ownership of the hatchery. BFRI supplies limited amount of broods to the hatcheries. From the Key informant interview, it was identified that around 2 crore broods are needed every year.
	Hatching	Hatching eggs from brood and keeping it in the tanks to complete initial nursing of newly born fry.
Fry traders	Fry trading	Buying fry from hatcheries and small farmers and sell to the farmers; fry traders include traditional patilwala. In addition to selling fry, they also provide embedded information of farming knowledge for their own business incentive.
Hatchery Agent	Trading Fries	Hatchery Agents are the distribution channel of some brand hatcheries like CP, Mega, Quality, Paragon and Fishtech. Usually, they get a certain commission from the hatcheries for selling fry to the farmers.
Input suppliers	Input retailing	Work as an intermediaries for the feed and other aqua-chemical companies; farmers buy feed and other inputs from the retailers.
Farmers	Production of tilapia	Farmers stock fry in their ponds and produce marketable size (roughly above 125 g) tilapia; later they sell tilapia to the paikers and retailers through arotdars.
Arot (or Arotdars)	Wholesale facilitation	Mainly commissioning agents; collecting Tilapia from farmers, and trades to both urban and rural farmers; takes 2-3% commission from the selling price.
Rural Paiker	Trading	Paikers are the buyers in arots and sell it in bulk (usually in maunds) to the retailers; sometimes, rural paikers sell to the urban paikers.
Urban	Trading	Buy fish from both arots and rural paikers; trade directly to the urban retailers and wholesale

paikers		buyers like hostels, Military and Hospitals.
Urban retailers	Retailing	Collect Tilapia from different urban paikers and sell to the urban consumers.
Rural Retailers	Retailing	Retailers sell to the consumers; usually, they have specific location in the markets and consumers buy in kg from them.
Rural consumers	Consumption	Consumers located mostly in the rural areas.
Urban consumers	Consumption	Consumers located mostly in the district headquarters and megacities.

Flow chart: Value chain Map of Tilapia



12.8 Feed Management

Now-a-days a variety of feeds are used for aquaculture including supplementary feed, farm-made feeds and industrially manufactured pellet feeds. In general, extensive farmers mainly use supplementary feed. The average price of supplementary feed was estimated to be Tk 20 per kg.Mash type homemade feed is usually prepared by rice bran, wheat bran, oil cake and occasionally incorporating soybean meal and fish meal. They apply the feed by making feed balls or as they purchase from the market. In contrast, farm-made feeds and industrially manufactured pellet feeds are used by farmers in semi-intensive and intensive farms. The farm-made feed ingredients are mainly rice bran, wheat bran, oilcake, fishmeal, flour, maize, oyster shell, salt, antibiotics, vitamin premix and additives. A significant number of farmers use mixture machines to produce farm-made feed. Normally two types of farmers make their own feeds; firstly those who need huge amount of feeds for their aquaculture operation, secondly farmers who do not rely upon commercial feed due to quality concern and high price. The average price of farm-made feed was calculated at Tk 25 per kg, which is 20-25% lower than industrially manufactured pellet feeds.Farmers who use their own feed, believe that the performance of farm-made feed is often better that the commercial feed.

The feed industries are located throughout the country. Although the main aim of feed business is profit making, many feed industries provide technical assistance through their technical staff.

The price of tilapia feed varied between Tk 25.45 and Tk 50.25 per kg, depending on feed types, quality, culture species, season, supply and demand. In general, floating feeds are expansive than sinking feed, on average 20% higher price.

12.9 Fertilizers and additives

Fish farmers mainly use fertilisers for grow-out operation. Fertilisers stimulate the growth of natural feeds, thereby increasing fish yields. Farmers mainly use organic and inorganic fertilisers. The most widely used organic fertiliser is cow dung, which is relatively cheap and readily available in rural areas at every HHs. The use of inorganic fertiliser is not widespread, and only better-off farmers can afford them. Semi-intensive farmers often use a mixture of chemical fertilisers

including urea and triple super phosphate (TSP), which are usually used in combination with cow dung.There is a considerable variation between the application of fertilization rates and different farming systems.

In addition to fertilizers, lime is used in ponds for maintaining water quality and natural productivity. Farmers are often induced to use various feed additives, growth hormones, enzymes, antibiotics and probiotics and other aqua products, such as aquaclean, zeofresh, oxylife, aquamix, gastrap, cevit-aqua, panvit-aqua, antivirus, etc. Mainly intensive and semi-intensive farmers are used these additives for higher production, environmental management, maintaining water quality and disease control.

12.10 Fish Marketing

Harvesting of tilapia starts as soon as fish reach marketable size. Most small-scale farmers harvest tilapia by themselves although a few large farmers depend on commercial harvesters. Vans and rickshaws are commonly used to transport tilapia from remote villages to the assembling centres near the main roadside. A wide range of poor people are involved in the tilapia marketing chain as traders, intermediaries, transporters and day labourers. The tilapia marketing system is traditional and less competitive but plays a vital role in connecting farmers and consumers, thus creating potential for adding value. With a few exceptions, farmers seldom communicate with consumers. Instead the marketing channel from farmers to consumers intertwine primary, wholesale and retail markets, involving local agents, suppliers, wholesalers and retailers from whom consumers make most purchases. The demand for tilapia is high in markets but supply is limited, and a strong multifunctional network has developed with intermediaries and traders intervening between farmers and consumers. The tilapia marketing system is traditional and less competitive but plays a vital role in connecting the farmers and consumers, thus contributing significantly in the value adding process. Tilapia marketing is almost entirely managed, financed and controlled by a group of intermediaries.

12.11 Margin and value addition

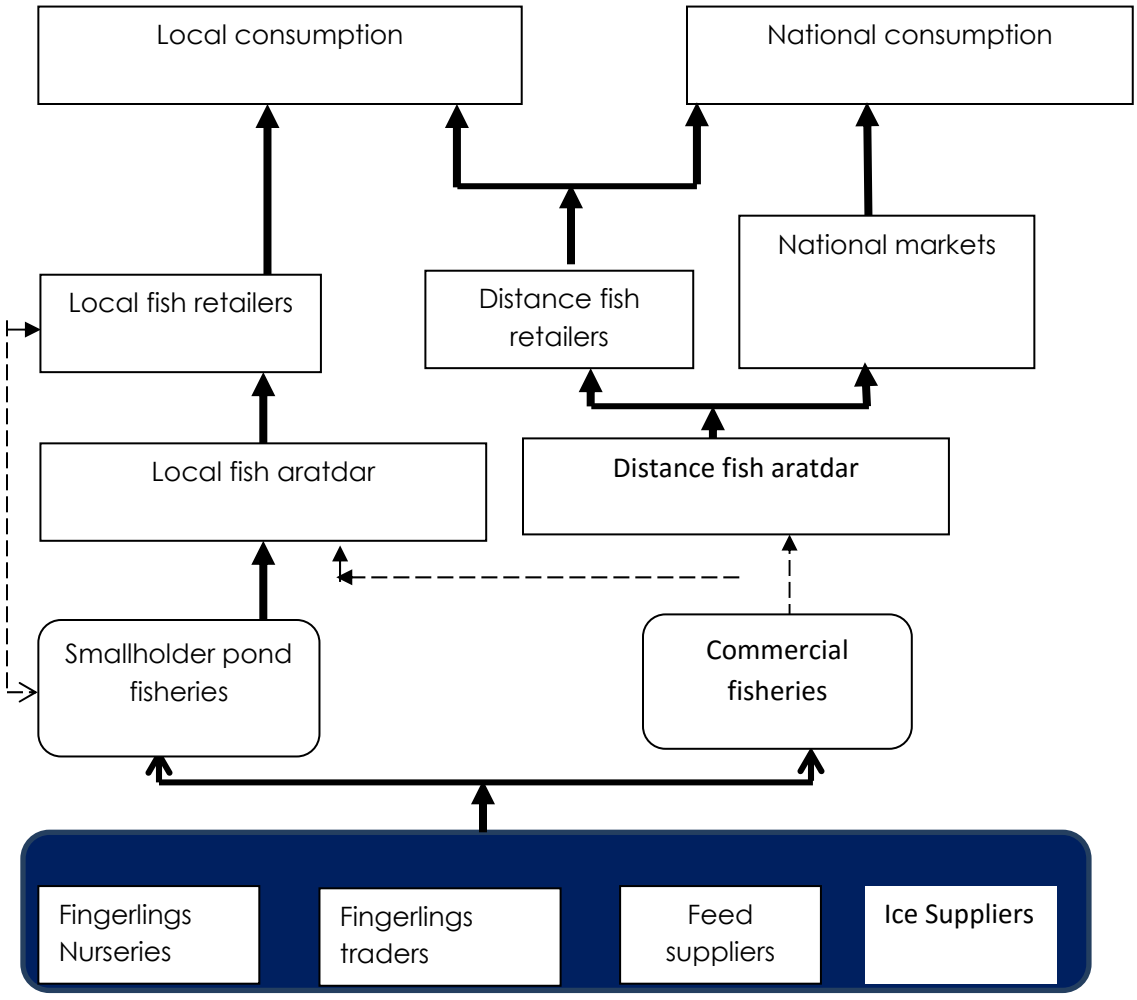
A total of BDT 35 value added to Tilapia from farm gate to the retailers. The highest value addition (54%) is done by the Farmers, while second & third place is taken by the Ratailers (27%) and Paikers (15%) respectively. Since Tilapia has the bigger market in the urban areas so, there is more scope for value addition / price increase in the retailing stage. At the same time, Paikers are key actors in

delivering the products to a larger perimeter, which gives them the leverage of increasing the price as per their costing. Arots, generally acting as a commissioning agent has the lowest value addition (4.1%), as the bargaining between the Arotdars and Paikers are mostly dominated by the Paikers.

Table-32: Value Addition in different stages of production

	Farmer	Arot	Paikar	Retailer
Price	115	119	130	150
Marketing Cost	3	1	8	5
Value Addition	40	3	11	20
Value Addition %	54.1	4.1	14.9	27.0

Flow chart of Tilapia fish Market:



12.3 Constraints, Market Based Solutions, and Potential Facilitation Activities

A number of constraints due to vulnerabilities were identified in the pond fisheries value chain. For each constraint, potential market-based solutions to the constraint and potential facilitation activities that development organizations may use to support market actors to develop and implement these market-based solutions. Constraints, market-based, solutions and potential facilitation activities can be found in the table below.

Sl	Constrains	Based Solutions	Potential Facilitation Activities
1.	Pond fisheries are vulnerable to tidal surges and floods which reduce interest in farmers to invest in commercial fish cultivation	Access to suitable fish species for fish cultivators to increase growth rapidly (Quick growing, over wintering fingerlings, etc.) Awareness of safe production and harvesting times for fish cultivators	Develop new local nursery men and support existing nursery men to promote good quality fingerlings and appropriate production technologies (quick growing fish species, over wintering/large size fish fingerlings, use of safe cultivation season etc.) Support fish feed and chemical marketing companies to promote improved feed and water purifying chemicals Support lead farmers to promote quick growing fish species Support aratdars to disseminate information to farmers on ideal times for production and harvesting and the benefits incurred by year round and strategic partial harvest.
2.	Lack of knowledge of modern fish cultivation techniques inhibits optimum benefit from pond fish	Access to modern fish cultivation technologies for farmers	See #1 above

	cultivation, and decreases profitabilityof fish cultivators.		
3.	Lack of cultivation for suitable quick growing fish species, which compensate for the loss endured due to cyclones, reduce chances for increased profitability of farmers from fish cultivation.	See #1 above	See #1 above
4.	Post disaster, there is a limited supply/stock of quality, sizeable fingerlings for pond producers to purchase, resulting in diminished benefit from pond fish cultivation.	Access to sufficient quality stock/supply of fish fingerlings for producers	Support nursery men to develop networks and maintain quality stock/supply of fish fingerlings
5.	Limited access to capital inhibits fish cultivators from collecting fingerlings, to restart their fish cultivation post cyclone and tidal surges.	Access to credit (in cash or in kind) for producers	Support fingerling suppliers to extend credit in-kind to farmers Support financial institutions (e.g. MFIs) to develop loans for growers
6.	Due to heavy rainfall, and impact from tidal surges, water logging occurs which destroys potential	Access to improved drainage system for stakeholders Access to improved pond management for	Support interested stakeholders to motivate local governmental bodies to improve drainage systems to diminish water logging

	for fish cultivation. Damage to ponds is exacerbated by farmers' poor pond management resulting in total or decreased loss for farmers.	producers	Train farmers in technical methods to improve pond management such as remedies for polluted water, saline water management, sourcing fingerlings, pond preparedness (utilization of durable netting, raised dikes).

12.14 A set of potential facilitation activities for the pond fisheries value chain include supporting:

- Development of new nursery men and capacity building of existing nursery men to promote good quality fingerlings and appropriate production technologies (quick growing fish species, over wintering/large size fish fingerlings, use of safe cultivation season etc.)
- Fish feed and chemical marketing companies to promote improved feed and water purifying chemicals in the areas
- *Aratdars* to disseminate information farmers on safe production and harvesting times, as well as methods to reduce risk to disaster through year round cultivation and strategic partial harvest pre cyclone seasons.
- Lead farmers to promote quick growing fish species cultivation during the safe production season
- Nursery men to develop a network with other nursery men to maintain a quality stock/supply of fish fingerlings (over wintering fingerlings) in the region for cultivation in the safe season
- Ice millers to produce ice with special arrangement during time of disaster and assist traders, fish farmers etc. to organize storage facilities for their fish on rental basis
- Nursery men and other input suppliers to extend credit in-kind to pond fish farmers
- Financial institutions (e.g. MFIs) to develop loans for pond fish farmers
- Stakeholders to motivate local governmental bodies, lead farmers, etc. to raised/repair embankments

13.0 Native chicken (Poultry value chain)

Poultry (e.g. native chickens, ducks) rearing at the household level plays an important role in income generation and poverty reduction, particularly for poor rural women or where people lack land for crop cultivation or formal skills to participate in income-earning activities. Poultry scavenge in and around farmers' homesteads, meeting most of their feed requirements in this way. Poultry contributes to household nutrition and provides income to buy food. Moreover, backyard poultry is mostly owned and managed, and sometime traded, by women, and therefore has high potential to advance women's socioeconomic empowerment.

Backyard poultry production is at the subsistence level of farming. Birds live free range and hatch their own eggs. Their diet is supplemented with crop waste or food leftovers. The labour involved in backyard poultry production is part-time.

In general, rural bock yard poultry is a low-input and low output system managed by women and children of the households. Sourcing feed from scavenging and auto-regeneration are the two important aspects of backyard poultry. The generic features of this system are:

- Typical flock size ranges between 5 – 25 birds
- Birds are raised under a scavenging system without special inputs in terms of feeding, housing or labor.
- Mainly local birds are reared although there are specific/ specialized indigenous breeds in some geographical areas.
- These breeds represent a rich source of disease resistant germplasm.
- The system auto-regenerates as the chicks are usually obtained by hatching locally.
- In most of the cases, eggs produced are for home consumption or for limited trade within the village.
- The production performance of these birds is about 40-60 eggs per annum and about 1-1.5 Kg meat at the end of the production cycle. It is a sustainable system with low dependency on external agencies.

Poultry value chains describe the processes through which birds and other inputs pass during the production process, including information on the place each process occurs and on the people involved.

The value or marketing chain for indigenous chickens in polder 43/2A is simple and under developed with no infrastructure at all save for some market stalls in the urban trading centres in Patuakhali city new market and other major markets inside the polder. The main actors along this value chain are smallholder farmers, primary collectors and live bird traders and agents, wholesalers and retailers. The main marketing channels are from farmer to trader or consumer (informal marketing). The other marketing channel is from farmer to retailer and then to consumer (primary marketing). Some farmers sell directly to restaurants/Hotels those who are located in who live in adjacent to Patuakhali district headquarter while others sell to traders (middlemen) who take their chickens either to secondary markets and urban markets (wholesalers). The final, end market of indigenous chickens is domestic consumption through retailers. Figure 13.1 shows the backyard poultry value chain map.

It was found that the majority of the indigenous chickens are moved from the producers to consumers through middlemen. The middlemen buy the chickens from neighboring farmers for sale at nearby markets within the districts or sell to assemblers for a markup. The second most important channel was the roadside. This was mostly used by those households that are located near the main highways and the targeted markets are the motorists.

13.1 Value Chain Map of Native Poultry

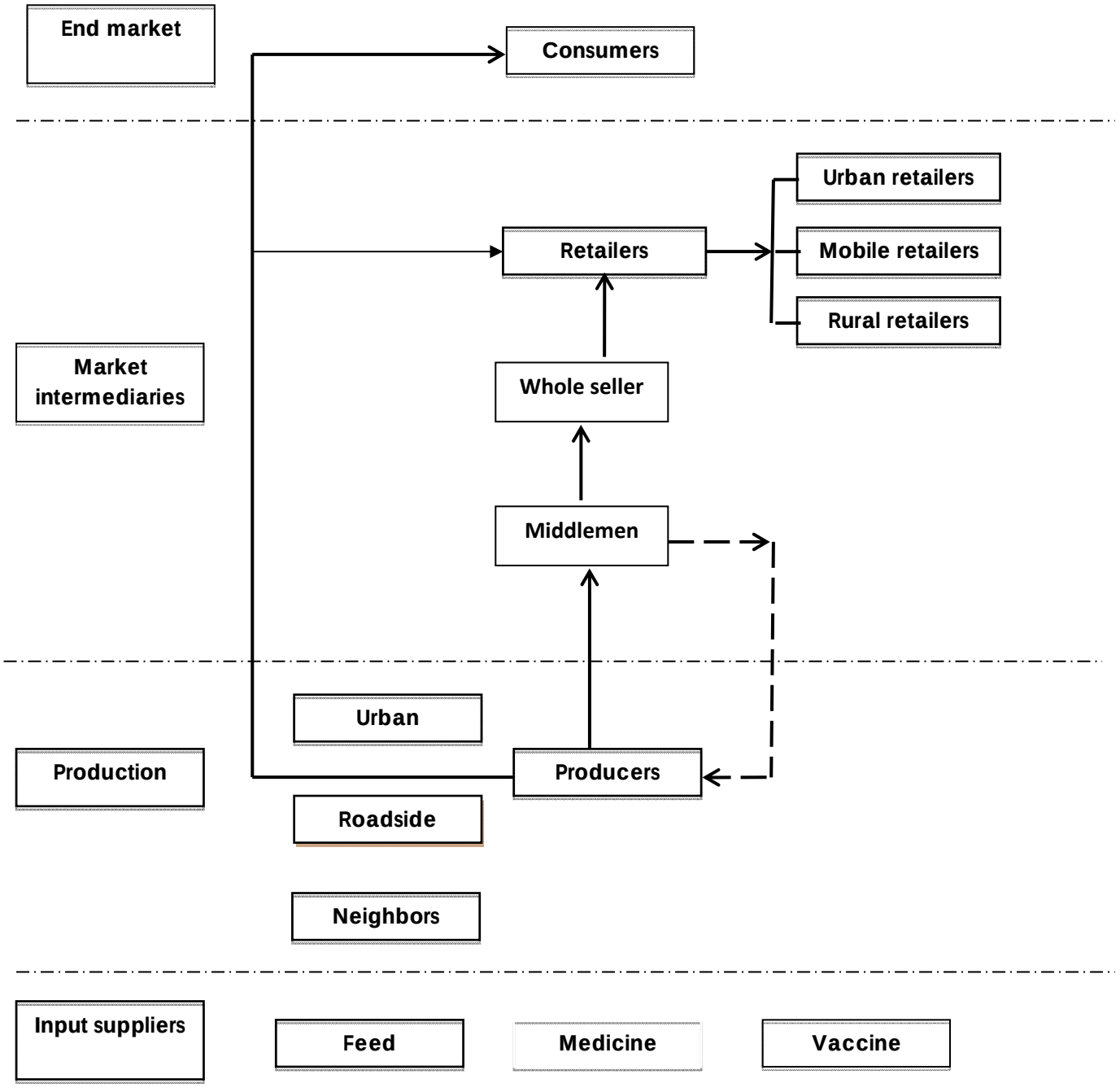


Fig: Backyard poultry value chain map at polder 43/2A

13.2 Production at farm level

Semi-intensive smallholder chicken raring is a common type of poultry production in the rural areas of polder 43/2A. Indigenous or village chickens freely wander around homesteads and scavenge for food with very little supplementary feeding being provided. The indigenous chickens cause minimal destruction to the environment and require minimal external inputs. Reasons for keeping indigenous chicken are varied and include food security, trading, barter or for quick cash when a domestic need arise as well as fulfilling customary obligations. In polder 43/2A almost all the households (66 percent) owned chickens.

At the production level, usage of improved technologies for producing indigenous chicken is very low. Most producers have not been exposed to any modern technologies that could raise productivity. Basic poultry housing among HHs in the polder found was generally absent. Some of the HHs shared accommodation with chickens except in some cases where they have built separate housing for the chickens. The food resources of indigenous chickens consisted of herbs or cereal seeds, insects which the birds scavenge with very little supplementary feeding provided by the owners.

There is a general lack of extension and veterinary services in most rural areas and consequently producer knowledge of methods of disease prevention and breeding practices is quite low. Farmers are still using traditional herbs for prevention of diseases while chickens are housed in unconventional houses that expose them to adverse weather elements such as rainfall and cold leading to high mortality and seasonality of production. Despite this, most of rural population lives in areas where the indigenous chicken is best adapted to the harsh living conditions.

13.3 Marketing at Farm Gate

As mentioned above, most households rear indigenous chickens as part of their livelihood strategy. The main reasons for keeping chickens included selling; home consumption. There is no HHs found inside polder keeping and selling chickens sorely for business purposes. For those that reported selling chickens, the main reasons for selling included the need to pay for children's school fees and the need to pay medical bills. The majority of the households found having sold an indigenous chicken. However, although most of the households selling

chickens, sales were quite low. Even among those who sold, the levels of sales were low. Similarly, consumption of chickens was quite low among these households.

The marketing system for indigenous poultry is a simple one, involving a number of marketintermediaries who take possession of the poultry before passing on the birds to the retailers or consumers. The prices obtained for the chickens by the farm household were also dependent on the channel used.

13.4 Retailing

Retailers are another important component of the indigenous chicken value chain. It is through them that the majority of the chickens get to the final consumers, the households. These are usually found in the markets which are scattered around the suburbs and procure the chickens either directly from the farms or from wholesalers at wholesale prices. The costs involved in procuring chickens from the wholesalers to the retail markets include the cost of purchasing the chickens, transportation, market fees, storage costs as well as losses in transit and during storage. The retailer sells the birds to the consumer through wet markets. In the wet market the consumer inspects the live bird and in the case of broilers the bird is weighed and then sold on live weight. The Sonali the weight is estimated and no formal weighing is involved. The birds are then de-feathered and processed at the market and the consumer returns home with the carcass. The reported margin at the retail is in excess and this represents the largest margin in the value chain.

13.5 Processing

Although restaurants only accounted for a small proportion of indigenous chicken marketed, they are an important segment of the value chain as they are the only ones adding value through processing. No packaging or frozen activities were observed inside polder or Patuakhali city new markets. But there is a service at the retail level for broiler and sonali birds they provides poultry slaughtering of birds as embedded services and for native birds they charge Tk 5-10 depending upon size of the birds.

13.6 Consumers

Demand for indigenous chicken, especially among the affluent, is very high because of its low fat content compared to broiler chicken. The demand for indigenous poultry in Patuakhali as well as polder 43/2A can be divided into two major segments, urban and rural. The urban segment of the indigenous chicken market comprises of adjacent to Patuakhali sadar upazilla like Kalikapur. There are several segments that can be identified within this urban market. These include (i) the high income groups, (ii) medium income groups, (iii) low income groups, and (iv) restaurants.

The majority of the households were found consuming more broiler chicken than indigenous chicken (2 times per month). On average, indigenous chicken was more expensive compared to broiler chicken.

In terms of preferences at household level, indigenous chicken was more preferred compared to broiler chicken for its taste, but for its higher prices consumers at poor HHs level consumption level is low. Demand of native chicken increases for family, social and religious program. On the other hand broiler chickens are available with a lower price than native chicken.

14.0 SWOT analysis of polder 43/2A

14.1 Strength

Natural Resource

- 3887 ha of cultivable land
- 55% medium high land
- Enough or sufficient fresh water surrounding the polder which facilitate crop production
- Out fall rivers are active and blessed by river Payra and Lohalia
- Good number of canals and khash land
- Canal length is 39 km

Infrastructure

- Embankment is fairly good condition, structures are also fairly good
- As main two roads have gone through southern part, this part is economically strong than northern.
- School, Madrasha, College, cyclone center, UP office.

Production

- Farmers are involved in modern technologies
- FFS & FLS are facilitating agriculture production
- Agricultural machineries are available
- About 100% farmers produce T. Aman and mungbean

Human resources

- Different service providers are present (Poultry workers, Fish traders, mechanics)

Social and Gender

- Women participation in meeting and different economic activities is encouraging
- There is no major social or religious conflict

Institutional

- There are 22 WMGs, 1 WMAs.
- There are different trained members in the WMGs (organizational management, leadership)
- There are different MFIs (ASA, BRAC, Grameen Bank, Padakhep, etc.)
- The whole polder including 3 Union Parishad and adjacent to the Patuakhali District town.

Economic & Commercial

- WMGs have savings to invest.
- 90% HH are in mobile coverage.
- Presence of different programs for economic development of this area.
- Some market products- mung bean, chili, betel leaf.
- WMGs have experience on different IGAs (agri-inputs)
- Presence of different market actors (e.g. Bapari, wholesaler)

14.2 Weakness

Natural Resource

- River erosion at certain points.
- Siltation of some khals.
- Salinity intrusion.

Infrastructure

- Lack of proper O&M.
- Few cyclone shelters.
- Lack of Killa (Shelter for Livestock usually made by earth.

- Poor condition of some sluice gates (leads to water logging)
- Some inlets are not working properly.
- Shortage of outlets.

Production

- Lack of quality agricultural inputs
- Shortage of irrigation water during dry season
- High price of inputs and low price of production
- Insufficient agricultural extension services
- Lack of knowledge on improved technology
- Non availability of HYV seed
- Early drainage limit fish production
- Lack of knowledge about CPM

Social and Gender

- 44% of HH fall under marginal & vulnerable group
- Infrastructures are controlled by influential people
- Due to social dilemma, women have less access to market

Institutional

- Not all the WMGs are registered
- Weakness in record keeping
- Some WMG EC committees are not interested in WMG activities
- Majority of the WMGs are in lack of O&M fund
- Elections have not been held after expiry of their tenure

- BWDB is not maintaining regular O&M

Economic & Commercial

- Lack of institutional credit facilities
- Lack of capital for IGA
- Weak marketing channel
- Small producers are forced to sell at farm gate
- Lack of commercial/lead farmer

14.3 Opportunities

Natural resources

- Possibility to increase cropping intensity through using modern production technology
- Available fresh water for cultivation in the munsoon

Infrastructure

- Irrigation channel development
- Khal re-excavation for irrigation and drainage
- Advocate BWDB design cell to design more environment friendly (ie. for fish cultures etc.) structures.

Production

- Unused and backyard land can be used for agricultural production.
- Water body can be used for case and pen culture for fishery
- Fodder crop cultivation
- Demonstration of some new technologies such as axial flow pumps (AFP) to cultivate distant fields
- Establish livestock vaccine cold chain for vaccination services at WMG/WMA level
- Introduction of production related activities through FFS
- Khal re excavation for irrigation and drainage to increase cropping intensity

Social and Gender

- Willingness of women to participate in WMG
- Awareness building on social and gender sensitization
- Awareness building for male & female to increase crop intensity.
- Women access to market
- More LCS involvement in Khal re excavation and repair embankments

Institutional

- Willingness of women to participate in WMGs
- Linkage between WMG and FFS to Private sector actors, GOs and NGOs
- Linking research institutions with FFS/WMGs
- Resource person from GOs and NGOs

Economic and commercial

- Road connectivity between Barisal and Barguna district
- Existence of Barga Chashi Unnyan prokolpo (BCUP)
- Create opportunity for skill development for women
- Use NGOs for micro credit
- Nursery & hatchery for Fish
- Introduce IGA for women

14.4 Threats

Natural Resource

Cyclone, Siltation, Excessive rainfall, Drought and salinity intrusion

Infrastructure

- Lack of river ghat
- Bad road communication increasing cost of production
- Limitations of budget for construction work

Technical Production

- Sudden outbreak of disease and pest
- Malpractice of adulteration

- Low quality of inputs and services

Social and Gender

- Conservativeness and religious influences/misinterpretation of religious thought.
- Out migration

Institutional

- Sudden change in Govt. Policy (BWBD gazette)
- Different relief and asset transfer project or program
- Political unrest

Economic & Commercial

- Limitations of budget
- Syndicates control the market
- Market distortion

15. Product Selection for Value Chain Development:

In polder 43/2F we found some potential crops considering HH involvements, volume of production and money earning scopes. The products are T. Aman, T.Aus, Vegetable, betel leaf, till, Tilapia, native poultry, chili, Mung bean, Sesame,groundnut, keshari, and sweet potato. People involve with different type of vegetable production but bitter gourd, bottle gourd, sweet gourd, country been are the main considering HHs involve and volume of production. For easy explanation we termed bitter gourd, bottle gourd, sweet gourd, country been as "vegetable".

Among the products we have primarily selected three crops for Value chain development through a matrix. The matrix and its rational of scoring under each area has been discussed below.

Blue Gold Program

Matrix for Value Chain Selection

Component-04

Criteria →		Growth Potential (32)					Impact (32)						Structure of the Industry (15)				Gender & Employment (17)		Collective Action(4)	Risk	Total Weighted Value	Rank
Crop↓	Indicate market level (Local, District, Regional, National, International)	Market Size	Unmet market demand	Potential productivity improvement	Expansion of area / capacity	Value adding to raw materials	Current production	Number of households involved	Contribution to HH income and wealth	Short or longer production/harvesting season	Food Security	Nutrition	Forward / backward linkages conducive to market based approach	Existence of service providers	Favourable business environment	Other programme interests	Involvement of women	Employment generation	Collective Action Oppor-tunities	Major risks (No,High,Medium, Low) green, yellow, red		
Weight →		7%	6%	6%	7%	6%	5%	5%	6%	5%	6%	5%	5%	4%	4%	2%	9%	8%	4%		100%	
Food																						
T Aman	National	5	1	1	0	1	5	5	1	3	1	1	1	3	5	0	1	1	0		1.89	7th
T Aus	National	5	1	1	0	1	3	3	1	3	1	1	1	3	5	0	1	1	0		1.69	11th
Betel leaf		3	1	1	1	1	3	3	3	5	0	0	0	1	1	0	0	0	1		1.31	13th
Til (Sesame)		3	3	3	3	1	1	1	3	3	1	5	5	1	3	1	1	1	3		2.3	5th
Mung bean	National/International	3	5	5	5	3	3	3	5	3	0	3	5	3	5	3	3	5	3		3.66	2nd
Chilli	National	3	1	3	3	1	1	3	3	1	1	3	3	3	3	3	3	5	3		2.6	4th
Bittergourd	District	3	1	3	1	1	1	1	3	0	3	5	3	1	1	3	1	1	5		1.95	6th
Peanut	National	1	1	3	3	1	1	1	3	3	1	3	1	1	1	3	1	3	3		1.86	8th
Bottolegourd	District	3	1	1	1	1	1	1	3	0	3	5	3	1	1	3	1	1	5		1.83	10th
Sweetgourd	District	3	1	3	1	1	1	1	3	0	3	5	3	1	1	3	1	1	5		1.95	6th
Countrybeen	District	3	1	1	1	1	1	1	3	0	3	5	3	1	1	3	1	1	5		1.83	10th
Sweet Potato	District	1	1	3	3	0	1	1	3	3	3	1	0	1	1	1	0	1	3		1.48	12th
Khesari/Cowpea	Regional	1	1	3	3	1	1	3	3	3	0	1	1	1	3	1	1	3	3		1.84	9th
Aquaculture																					0	
Tilapia	National	3	3	5	3	5	1	1	5	3	5	5	5	3	5	5	0	1	5		3.25	3rd
Livestock																					0	
Native poultry	Regional	3	5	5	5	1	5	5	5	5	3	5	3	3	5	5	5	5	5		4.32	1st
																					0	

16.0 Scoring rationality/Explanation of Value Chain selection

A. Growth Potential (32)

1. Present Market size (7)
2. Unmet market demand (6)
3. Productivity Improvement (6)
4. Expansion of areas/capacity (7)
5. Value Addition (6)

1. Present Market Size 7			
Weight level maintain criteria (0-5)	• Local, regional, national, or international level of envisaged end-market has been defined, • Consider volume, or value of the market to compare, cereals are usually large volumes & values = 5, • But scavenging eggs are low volume & value in comparison = 1		
Score 5	**Score 3**	**Score 1**	**Score 0**
T. Aman, T.Aus,	Vegetable, betel leaf, till, Tilapia, native poultry, chili, Mung bean	Groundnut, keshari, sweet potato	

Key information against the criteria:

- Cereal is consumed by 100% of people. It has both a national and international market. Moreover, the value of rice is also high 35-55 Tk/kg. So, it has been scored "5".
- Compared to cereal, vegetable consumption is low. It is not consumed on a regular basis and amount of consumption depends on price. Demand of vegetables is higher to the well-off families, and mainly in the district market. Price fluctuation is very common although retail price is attractive. Little amount of vegetable is exporting. So, it will score "3".
- Till has demand in poultry industry. Some also extract oil which is consumed by a little portion of the people. The value of Till is very high. Market size of betel leaf, Tilapia, chili is comparatively low although value of these products is high.
- Although the local market size is small for Mung bean it has an international market. The value of mung bean is very high, 80 Tk/kg. Considering this it has been scored "3".
- The market size of groundnut, khesari and sweet potato is very small and the value is comparatively low.

2. Unmet market demand (6)			
Weight level maintain criteria (0-5)	• Is the demand trend increasing, does the market growth by a high %, • Do you recognize any potential for quick expansion, do buyers clearly seek more than the supply available, than we score this 5, • Markets who only grow on the basis of population growth get 1, and • Market demand that is decreasing, some products get out of our diet or are replaced by substitutes =0		
Score 5	**Score 3**	**Score 1**	Score 0
Mung bean, native poultry	Till, Tilapia,	T. Aman, T.Aus, betel leaf, Vegetable, chili, Groundnut, keshari, sweet potato	

Key information against the criteria:

- The demand for both Mung bean and native poultry is increasing. If present production increased by 300%, even then the market will not be saturated. The local industry and international market have a great demand for mung bean. Buyers are contracting and even giving advance to ensure the supply of mung bean.
- Due to health consciousness, the demand for native poultry is very high. Market price of native poultry is almost double than commercial poultry.
- Till (Sesame) and Tilapia have also scope for more expansion. Due to low price, fish has a great demand from the poor. The side product of till oil extraction is a good source of protein in poultry industry and aquaculture. So, these can score "3" compare to mung bean and native poultry.
- But in case of other products the gap between demand and supply is very low. Usually demand is high rather than supply. But if supply increase by even 25% it may be excess to demand and price may fall down.

3. Productivity Improvement (6)			
Weight level maintain criteria (0-5)	• Do we know of accessible technological (broad sense) improvements? • If no potential to improve productivity, score =0, • Very limited potential (<10%)=1, • Medium potential(10-19%) = 3, • High potential to increase productivity (≥20%)=5		
Score 5	**Score 3**	**Score 1**	**Score 0**
Mung bean, native poultry, Tilapia,	Vegetable, chili, Till, keshari, sweet potato, Groundnut	T. Aman, T.Aus, betel leaf	

Key information against the criteria:

- Considering present productivity of different products in the polder 43/2F this scoring has been done. Productivity of Mung bean, native poultry and Tilapia can be increased by double or even triple considering present production technologies. Introducing new Variety, technological improvement and ensuring service will help this process. HYV, irrigation and disease control in case of mung bean; improve management practice and vaccination in case of poultry; improve management and introducing mono-sex in case of Tilapia will make it possible.
- Utilization rate of HYV in case of Vegetables, chilli, Till, keshari, sweet potato and groundnuts in the polder 43/2F is very low. Improving input utilization will increase production. So, it has been scored "3" to this group, except for vegetables as it has in comparison somewhat less improvement potential.
- T. Aman, T.Aus and betel leaf has limited scope for production increase.

4. Expansion of areas/capacity (7)			
Weight level maintain criteria (0-5)	• If no scope to expand, e.g. T. Amman rice score =0, • very limited scope (<10%) =1 • Medium scope (10-20%)= 3 • High potential (≥20%) e.g. winter crops where cropping intensity is still very low due to infrastructure constraints=5		
Score 5	**Score 3**	**Score 1**	**Score 0**
Mung bean, native poultry	Tilapia, chili, Till, keshari, sweet potato, Groundnut	Vegetable, betel leaf	T. Aman, T.Aus

Key information against the criteria:

- Just due to irrigation facilities, tillage facilities and capital a huge amount of land remains bare in winter season. There is a scope for area expansion even more than 100% for those who already cultivate Mung bean. In their present capacity it is possible to increase poultry population even more than 200% as it requires a very limited area. Even HHs just having homesteads can rear poultry.
- Considering the present involvement of HHs, the scope for expansion for Tilapia, chilli, Till, keshari, sweet potato, and groundnutsis little lower than Mung bean, native poultry.
- For both Vegetable, betel leaf high land is required which is very limited in the polder. So, scope for area expansion is very limited.
- As almost 100% land is under cultivation of T. Aman and T.Aus, there is no scope for area expansion.

5. Value Addition (6)			
Weight level maintain criteria (0-5)	• The potential for farmers or small or micro enterprises to add value and increase earnings locally would score 5, • If it requires a much larger investment by a processor at regional level =3 or even 1 • When technically there is no value addition possible =0 • If no value addition possible, score =0, very limited chance =1 (<10%), Medium potential (10-19%)= 3, High potential (≥20%)=5		
Score 5	**Score 3**	**Score 1**	**Score 0**
Tilapia	Mung bean	Native poultry, chili, Till, keshari, sweet potato, Groundnut, Vegetable, betel leaf, T. Aman, T.Aus	

Key information against the criteria:

- In case of Tilapia local level value adding scope is much higher.
- The price of Mung bean differs upon its pod size and moisture content. So, local level value adding is possible.
- In case of native poultry, chili, Til, keshari, sweet potato, Groundnut, Vegetable, betel leaf, T. Aman, T.Aus there is little scope for value addition at farmer level or regional level only limited to harvest to marketing of products like indigenous packaging to protect from damage during transportation.

B. Impact(32)

1. Current production(5)
2. No. of HH Involved (5)
3. Contribution to HH income(6)
4. Seasonality-Short or long harvesting season(5)
5. Food Security (6)
6. Nutrition -potential of increasing Nutrition intake (5)

1. Current production(5)	
Weight level maintain criteria (0-5)	• The % of the land presently under cultivation of this crop, or • The present scale (scavenging versus large broiler farms) or volume of production sets the foundation for the level of impact that can be expected. • T. Aman is produced on nearly 100% of the area available =5

	• A crop that only commands a very small percentage of the area =1 and • A crop that still needs to be introduced =0, If a crop is produced on say around 50% of land then score=3		
Score 5	**Score 3**	**Score 1**	**Score 0**
T. Aman, native poultry	Mung bean, betel leaf,T.Aus	Tilapia, chili, Till, keshari, sweet potato, Groundnut, Vegetable	

Key information against the criteria:

- T. Aman covers almost 100% of cultivable land and there are about 132,000 (5280 HH X 25 bird) birds in the polder. So, here the impact would be at highest level.
- Land covered by Mung bean, betel leaf, T.Aus is moderate and low compared to the T.Aman.
- But Tilapia, chili, Til, keshari, sweet potato, Groundnut, Vegetable is cultivated in smaller area compared to other two categories.

2. Number of households involved(5)			
Weight level maintain criteria (0-5)	• If less than <5% HH Involved, score =0 • Involvement by (5-20%) =1 • By (20-60%)= 3 • High potential (>60%)=5 (explanations are similar as above)		
Score 5	**Score 3**	**Score 1**	**Score 0**
Native poultry, T. Aman	Betel leaf, Mung bean, chili, keshari, T.Aus	Tilapia, Till, sweet potato, Groundnut, Vegetable	

Key information against the criteria:

- About 100% HHs involved with T. Aman cultivation and 75% with poultry rearing.
- Betel leaf, Mung bean, chili, keshari and T.Aus cultivated by 30-50% HHs.
- Tilapia, Til, sweet potato, Groundnut, Vegetable is covered by below 20% HHs.

3. Contribution to HH income and wealth(6)			
Weight level maintain criteria (0-5)	• Consider the present versus potential contribution to HH income (contribution to yearly income as %) • Score =0 (only loss making produce) • Very limited potential to contribution (>5%) =1 (a produce which will always be low in volume, and value despite productivity improvements) • Medium potential (6-25%)= 3 • High potential (>25%)=5		
Score 5	**Score 3**	**Score 1**	**Score 0**
Mung bean, Native	Betel leaf, Til,	T. Aman, T.Aus	

poultry, Tilapia	Groundnut, chili,keshari, sweet potato, Vegetable		

Key information against the criteria:

- T. Aman and T.Aus have very limited scope to contribute in increasing HHs income considering to present status. Utilizing of quality inputs and service will increase productivity but considering costing, net income increase will also be very low.
- In case of betel leaf, Till, Groundnut, chili, keshari, sweet potato, Vegetable, there is medium potential to increase production. Moreover, ensuring better service and market linkage there is a possibility to increase income moderately.
- In case of commercial production and good marketing a HH income may increase by more than 25%.

4. Short or longer production/harvesting season(5)			
Weight level maintain criteria (0-5)	Short peak harvesting window, in combination or not of being perishable or yearlong production with regular income makes a big difference to HH financial situation. A product with a short critical harvesting window, moreover being a perishable product having to be sold rapidly score =0, if short harvesting period but not perishable =1, while a crop with a lengthy harvesting period say milk =3, while the permanent production like betel leaf =5		
Score 5	**Score 3**	**Score 1**	**Score 0**
Native poultry, Betel leaf	Mung bean, keshari, sweet potato, Groundnut, T. Aman, T.Aus, Til	chili, Tilapia	Vegetable

Key information against the criteria:

- Native poultry and betel leaf have year round production with regular income. Moreover, poultry is not perishable, whereas betel leaf is slightly perishable. Considering the both criteria we score them "5".
- Mung bean, keshari, sweet potato, Groundnut, T. Aman, T.Aus and Til have short harvesting period but they are not perishable. Considering these points score for these three products will get "3".
- Harvesting period of Tilapia and green Chilli is short and they are also perishable. In this case they will get "1".
- Harvesting period of vegetables is short and it they are more perishable than others. Compare to other it will score "0".

5. Food Security(6)			
Weight level maintain criteria (0-5)	• If no impact on food security as non-food product score =0, • A food product already being produced locally in surplus has very limited impact opportunity =1 • Medium potential for impact= 3 • A food crop which regularly has to be imported to maintain food security in the area, has high potential to impact=5		
Score 5	**Score 3**	**Score 1**	**Score 0**
Tilapia	Native poultry, Vegetable	Chili, Til, keshari, sweet potato, T. Aman, T.Aus, Groundnut	Betel leaf, Mung bean,

Key information against the criteria:

- Betel leaf is a nonfood item. Mung bean is a food item but people do not eat it locally and 100% sell. These products have no impact on food security.
- T. Aman and T.Aus are the main food items of the people but it is a surplus product in this area. So, it will result in very little impact. On the other hand chili, Til, keshari and sweet potato required volumes are low but there is a shortage of these products as only 20-30% of HHs produce these products.There is a remarkable shortage of poultry, egg and vegetable in this polder. The requirements are rather higher than the previous one. Increase of its production will have a good impact over the HHs. Moreover, these can be substitutes of other food items.
- Compared to other food products Tilapia has great market demand in the polder and at present almost 100% comes from outside on a regular basis.

6. Nutrition-Potential of increasing Nutrition intake (5)			
Weight level maintain criteria (0-5)	Some product which is needed to ensure proper nutritional food intake, e.g. some micro elements usually in shortage should score high; If no impact possible on nutritional intake (e.g. no food crop) , score =0, very limited potential =1, Medium potential = 3, High potential =5 e.g. moringa with recognized high nutritional value.		
Score 5	**Score 3**	**Score 1**	**Score 0**
Til, Vegetable, native poultry, Tilapia	Groundnut, Mung bean, chili	Keshari, sweet potato, T. Aman, T.Aus	Betel leaf

Key information against the criteria:

- Betel leaf is a nonfood item.
- Sweet potato, T. Aman and T.Aus are carbohydrate sources of which there is usually no short fall among the people. Even people take more than required. Although keshari is a protein source which has a great short fall among the people it contains

a poisonous element (Lathyrism) which causes health hazard to child and pregnant mother.

- Groundnut and Mung bean are protein sources which have a clear shortfall. But these are low grade protein compared to animal protein. Moreover, people are not habituated to take these items frequently. Chili contains vitamin C which is very essential and one needs a regular supply as the body can't store the excess Vit-C.
- Til, native poultry, Tilapia are good sources of protein and people usually take or like to take these. Vegetables contain many micro elements essential for the body. These items should be taken regularly and there is a substantial shortage of vegetables in the polder.

C. Structure of the Industry (15)

1. Forward/backward linkage and MD Approach (5)
2. Existence of Service Providers (4)
3. Favorable Business Environment(4)
4. Other program Interest(2)

1. Forward / backward linkages market development approach(5)			
Weight level maintain criteria (0-5)	• Consider existence of lead firms, in either input, processing or marketing, the suitability of these actors and ease of getting them involved, will determine potential. If no potential for Market linkage or development approach, e.g. • Due to complete absence score =0 • Very limited potential =1 • Medium potential = 3 • High potential =5		
Score 5	**Score 3**	**Score 1**	**Score 0**
Mung bean, Tilapia, Til	Native poultry, chii, Vegetable	keshari, Groundnut, T. Aman, T.Aus	Betel leaf, sweet potato

Key information against the criteria:

- There is processing industry that processes and trades Mungbeans at Barisal. Market actors are available and proactive. BARI has developed different HYV and DAE is disseminating the technology. All inputs are available and service quality is fairly good. Only problem is accessibility where there is scope for development.
- There are Tilapia hatcheries and fish processing centers in this region. Til has great demand in poultry feed industry. There are also local processing centers which extract oil from till. Forward and backward market actors are available in the surrounding area with moderate linkages. Considering these issues it will score "5".
- For native poultry, chili and Vegetable there is no or very limited scope for processing regionally. Although quality inputs are available in the surrounding area but still drawing low demand. Market actors are at the district and upazila level but low volume and sporadic production do not attract them.

- For keshari, Groundnut, T. Aman and T.Aus, there is no scope for industrial linkage regionally although there is scope for processing. Quality inputs for these products are not available. The quality and quantity of market actors is poor.
- For betel leaf and sweet potato there is no industrial linkage, nor input traders. There are also few market traders,their linkage is weak and service is almostnill.

2.Existence of service providers(4)			
Weight level maintain criteria (0-5)	• Similar to above, existence and performance of public and private service providers to the value chain actors. If no existence for SP, score =0 • Very limited presence (1/2) =1 • Medium presence (2-5)= 3 • High existence (>5) =5		
Score 5	**Score 3**	**Score 1**	**Score 0**
	Tilapia, Mung bean, native poultry, T. Aman, T.Aus, chili	Betel leaf, Till, keshari, sweet potato, Groundnut, Vegetable	

Key information against the criteria:

- For Tilapia, Mung bean, native poultry, T. Aman, T.Aus and chili govt. provide technical and extension services. But due to manpower shortages the service is weak. Quality of the service providers is moderate and barely available where poor HHshas limited access. Private sector has quality service but presently has limited access. Considering there we score these "3".
- Comparing with the above products Govt. has less interest in Betel leaf, Til, keshari, sweet potato, Groundnut and Vegetable. Existence and performance of private service is also weak compared to the above one.

3. Favorable business environment(4)			
Weight level maintain criteria (0-5)	• Consider relevant issues in the BEE. Absence of constraints or existence of support measures to doing business scores high, the extent of government involvement distorting the market could be negative. • If business environment is obstructive in several ways score =0, • Score higher in accordance with the business environment being more developed (e.g. aquaculture standards are available) and supportive (any subsidies, high on government policy priorities) or not.		
Score 5	**Score 3**	**Score 1**	**Score 0**
T. Aman, T.Aus, Mung bean, Native poultry, Tilapia	Chili, Til, keshari	Groundnut, sweet potato, Vegetable, Betel leaf	

Key information against the criteria:

- Paddy is of the highest concern for the government. To increase its production govt. is providing subsidies for diesel and fertilizer, prior also electricity supply, bank loans. After harvesting govt. purchase paddy from the farmers and fix a minimum rate.
- DAE has different program for Mungbean extension. Research institute has research program.
- Government is providing a subsidy on vaccines for poultry development. For poultry sector development have specific policy. Avian influenza cell is active to prevent and eradicate this disease.
- DoF and FRI is working for Tilapia extension and improvement. Government is providing tax exemption/reduction in total aquaculture sector. Beside world fish is working for Tilapia hatchary improvement through skill development. All these initiatives are providing a better BEE for these products and thus can score "5".
- Government has different program for support in Variety development and extension of chili, Til and keshari.
- But for Groundnut, sweet potato, Vegetable and betel leaf there is no special program of emphasis or subsidy.

4. Other program interests(2)			
Weight level maintain criteria (0-5)	• The extent there is opportunities for coordination, complementary action and synergy with other local program. • If no NGO/Org working in the same sector, score =0 • Very limited presence (1-2) =1 • Medium presence (3-5)= 3 • High presence (>5)=5		
Score 5	**Score 3**	**Score 1**	**Score 0**
Native poultry, Tilapia	Mung bean, Chili, Groundnut, Vegetable	Til, keshari, sweet potato	T. Aman, T.Aus, Betel leaf

Key information against the criteria:

- In almost every development program in this polder there is a space for poultry. Even microcredit program is providing support for poultry. In our FFS we have a poultry module. World fish is working specifically on Tilapia extension and sector development. In other market development programs they are working in Tilapia Value chain, like: AFE.
- Other programs are not exclusively with Mung bean, chili, Groundnut, or Vegetable. Rather they are working for homestead or agricultural development where these products are a part. So, interest is moderate compared to the previous ones.
- Only government has an extension program for Til, keshari, and sweet potato.
- For paddy and betel leaf there is no known such type of programs.

D. Gender and Employment (17)

1. Involvement of women (9)
2. Employment Generation (8)

1. Involvement of women(9)			
Weight level maintain criteria (0-5)	Focus is on the contribution to women empowerment, not just more work while they are already overburdened and only would be to the detriment of the family. Aim is to give them for example an opportunity to retain income. If no women involvement potential, score =0, very limited potential =1, Medium potential = 3, High potential =5		
Score 5	**Score 3**	**Score 1**	**Score 0**
Native poultry	Mung bean, chili	Til, keshari, sweet potato, Groundnut, Vegetable, T. Aman, T.Aus	Tilapia, Betel leaf

Key information against the criteria:

- Native poultry is solely undertaken by women.Women are responsible for rearing, management, and treatment, marketing. Moreover,they have control over this income with some are exceptions. So it will score "5".
- Women are fully involved in harvesting of Mung bean and chili. These create employment opportunity for women. But this opportunity is for a short time, only in harvesting period and constitutes little more than extra work.
- Women are involved in one or more stages of Til, keshari, sweet potato, Pea nut, Vegetable and paddy from cultivation to harvesting. But the service is generally unpaid family labor.
- In case of Tilapia and betel leaf, women have no involvement.

2. Employment generation(8)			
Weight level maintain criteria (0-5)	Labor intensity of the envisaged intervention (could be area expansion, adding value, productivity increase). Number of employment creation, the type (quality) of employment and opportune timing thereof. If no potential for employment generation, score =0, very limited potential (<5%)=1, Medium potential (5-10%)= 3, High potential (>10%)=5		
Score 5	**Score 3**	**Score 1**	**Score 0**
Native poultry, Mung bean, chili	Groundnut & Sweet potato	keshari, Tilapia, Til, Vegetable, T. Aman, T.Aus	Betel leaf

Key information against the criteria:

- If number of poultry increases and farmer consider it as a business, than it will create an opportunity for a good number of poultry vaccinators where income and employment status is good. There is a possibility to create an opportunity for at least

10 vaccinators. Mung bean, chili has potential for area and productivity increase. In that case it will facilitate extra 50-70% labor during harvesting.

- Groundnut & sweet potato also require labor during harvesting. Considering possibility of expansion and production increase there is a possibility to increase labor and employment generation may increase up to 10%.
- Considering the possibility of production increase keshari, Tilapia, Til, Vegetable, T. Aman and T.Aus may create an opportunity for mainly labor employment at a minimum level.
- For betel leaf there is no such type of opportunity.

E.Collective action opportunities (4)

1. Collective action opportunities(4)			
Weight level maintain criteria (0-5)	• Does this product lend itself to Business ideas for cooperatives, on the input or market side, and producer groups benefitting of doing these collectively. • If no opportunities for collective action (working in collaboration/ as cooperatives), score =0 • Very limited potential =1 • Medium potential = 3 • High potential =5		
Score 5	**Score 3**	**Score 1**	**Score 0**
Native poultry, Tilapia, Vegetable,	Mung bean, chili, Til, keshari, sweet potato, Groundnut	Betel leaf	T. Aman, T.Aus

Key information against the criteria:

- In case of poultry there is a possibility for collective action for inputs (feed, medicine, vaccine) and marketing, as per household production is very low. Farmer can also develop producer group which will attract market actors and service providers. This is also possible for Tilapia and vegetables as most farmers are small producers. Considering these possibilities there are better opportunities for collective action.
- In case of Mung bean, chili, Til, keshari, sweet potato and Groundnut, farmers can purchase inputs collectively. As harvesting period is very short and individual production is relatively high scope for collective marketing is comparatively low. There are possibilities for producer group formation.
- In case of betel leaf, the scope for collective action in both input and marketing is very limited. But the possibility for producer group formation to attract services is real.
- Paddy has almost no opportunity for collective action as collective effort will not provide any remarkable benefit.

F. Risks

Major risks (No, High,Medium, Low)			
Weight level maintain criteria (0-5)	Consider major risks for this product (the absence of risks will score green, general prevalence of risks orange, but risks with high certainty of occurrence and extremely damaging to the produce should be give red.		
Level of risk			
	Native poultry, Tilapia	Mung bean, Chili, Bitter gourd, Groundnut, Sweet gourd, Country bean	

Key information against the criteria:

- Susceptible to diseases of native poultry is comparatively low.
- High opportunity to collective action of backyard poultry (Input collection, egg selling, Poultry meat selling).
- Farmers usually sales their egg at farm gate level to local egg collectors.
- High opportunity to collect or purchase Tilapia inputs collectively.
- Also opportunity to sale Tilapia collectively which has unmet market demand at local and regional markets.
- Medium opportunity to collective action. Farmers generally sales their Mung bean at Khasherhat bazaar or farm gate, some farmers at Patuakhali, Amtoli and Barisal.
- Also opportunity to sale Mung bean, Chili collectively.

17. Conclusions

By overall consideration It could be said that there is significant scope to apply market-oriented approaches to the Polder 43/2A for some economic crops like Mungbean, Peanut, Sesame, Tilapia etc. These approaches have the potential to generate a number of improvements over traditional DRR and relief approaches currently being implementing. Utilizing these approaches will undoubtedly generate additional benefits for the poor including increased sustainability of economic gains. As determined by the various market based solutions, the implementation of 'potential facilitation activities' will address the specific constraints of market actors specific to Polder 43/2A.

18 Annexure

18.1 Information of Chatobighai Union of polder 43/2A

Choto Bighai Union

General Discription:

Information collection from union parishad

Choto Bighai union is comprised of an area of 2,776 ha. (BBS, 2001) of land of which the total cultivable land is 1,465 ha. (53%). The number of farmers family is 4,144 where 22% are share croppers. The area under irrigation is only 7%, which is due to surface water salinity in the dry season. The salinity rate and other natural hazards are increasing day by day as reported by the local people. The area is exposed to severe cyclone and strom surges that cause huge sufferings in human lives and loss of agricultural crops as well as other assets of the people.

Agriculture

Land Type Classification:

Land type is the dominant factor guiding choice of crops and cropping patterns of any area. Selection of crops/cropping patterns largely depends on the topographic position of land in relation to seasonal inundation depth and its duration. Lands, which are above normal inundation level, can provide a wide range of opportunities for growing both perennial and year round annual dry-crops. The major land type of this union are medium high land (75%), and high land (25%), which indicates that most of the land areas remains under moderately monsoon flooding and suitable for wetland crop cultivation. The limited high land is not inundated by monsoon flooding but other areas are inundated by the monsoon flooding for 4 to 5 months at various depths upto 90 cm.

Soil

The union lies under Agro-ecological zone: ganges Tidal floodplain (AEZ-13) and Young Meghna Estuarine Floodplain (AEZ-18). The soil are formed from alluvial sediments of the rivers crossing this upazila. They are seasonally flooded, poorly drained soil developed in medium texture to fine textured alluvial deposites. River banks have narrow strips which are non-calcareous and loamy. Silty soils are predominating but there arre significant amount of silty clay or clay soil found in shallow basine areas. The soils are moderately to very slowly permeable having well to poor moisture retention capacity in the dry season. The soil PH range from 5.5 to 7.5. Soil salinity range from very slightly to moderately saline ((2-4 ds/m)and partly strongly saline in dry season.

Present land use pattern:

The land of this union is dominated by agricultural crop cultivation, which cultivated mainly under rainfed condition. The agricultural practices are mainly depending on favourable natural environment. The present cropping intensity of this union is 210%. The present cropping patterns of this union are shown below:

Name of union	Net Cultivable land (ha)	Major cropping pattern	Cropping intensity	Area (ha)	Remarks
Chotobighai	1,465	Pulse/Chilli/Oilseed/S.Potato – fallow – T.Aman (LIV/HYV)	210	320	35.88%
		Fallow – T.Aus – T.Aman		550	15.95%
		Spice/Pulse/Oilseed – T.Aus – T. Aman		325	30.07%
		Annual crops (Sugercane/Betel leaf/banana)		50	01.04%
		Fallow – Fallow – T.Aman		180	14.96%
		Vegetable/Others		40	02.10%
		Total		**1,465**	**100%**

Source: Field Survey, 2009-10

Robi crops cultivated in this area: Chilli, vegetable, egg plant, Mungbean, khesari.

Agricultural land suitability:

For crop production we must know the suitability of the land so that we can get better production with comparatively low cost. For determining the physical suitability of land we have to know the nutrients of the land, groundwater salinity, physical structure of the land, level compare to sea level etc. Here, we have presented the features in a table below.

Union Name	Land type	Topsoil texture	Soil PH	Soil salinity	Land suitability
ChotoBighai	HL-25% MHL-55%, LW-20%	Cl-clay	5-7	2-6	Mostly S2 & S3

Major Problem and Impacts:

- Water stagnation/drainage congestion
- Low organic matter contents in soil
- Soil moisture deficit during the dry months
- Essential plant nutrient deficiency
- Risk of tidal flood, river erosion and saline water intrusion

Management practices for improving crop cultivation:

Drainage congestion can be removed by excavating new canals and re-excavating old once making connection to the adjacent rivers which might accommodate excess water of flood and thus would help to reduce the damage caused by flood. Most of the old canals of the union have been diverted or closed due to unplanned construction of housing, markets, infrastructures which are creating barriers to normal water flow and making drainage congestion. So, appropriate measures with motivation and awareness building should bee taken immediately where our WMGs (water management Committee) can take initiative. Besides, messages can be disseminated through FFS.

Development of irrigation facilities by preserving sweet surface water in the khals, introducing of low lift pumps (LLP) and other inputs in the local markets, well planned uses of lands ass per its criteria could help to increase higher yields of agricultural crops.

To increase the organic matter in the soil, leguminous crop cultivation could be suggested in the present cropping pattern. Besides, application of organic manures and bio- fertilizers can improve deficiency of soil nutrients.

Institutional arrangements suggested in this report would help to ensure the participation of stakeholders for sustainable management of land resources through proper implementation preventive and improving measures.

Fisheries

In Bangladesh fisheries provides 60% of the national animal protein and this sub-sector contributes about 5% of the GDP and about 9% to the foreign exchange earnings. Nearly, 1.2 million people directly employed in this sector and another 11 million are indirectly engaged in activities related to this sector.

Wet land distribution:

The union has a total wet land area of 693 ha. of which 115 ha. Is under aquaculture. Aquaculture comprises of homestead pond fish culture in 9 ha. And prawn culture in 1 hacter. The open water fisharies consists of river, canal and floodplain with a area of 577 hacter.

Wetland distribution at Chotobighai union:

Total area (ha.)	Pond culture (ha.)	Fish culture (ha.)	Prawn culture (ha.)	Total culture (ha.)	Total capture (ha.)	Total wet land (ha.)
2,975	105 (3.53%)	09 (0.3%)	01 (0.03%)	115 (3.87%)	577 (19.39%)	692 (23.26%)

Forestry:

Forestry isa long term production system, has manifold contribution towards the welfare of mand kind, biodiversity and environmental conservation. The multiple uses of forest resources have been recognized from the advent of civilization. The forestry sector contributes 1.86% to the total GDP of Bangladesh (Forest department, 2006).

General forest information:

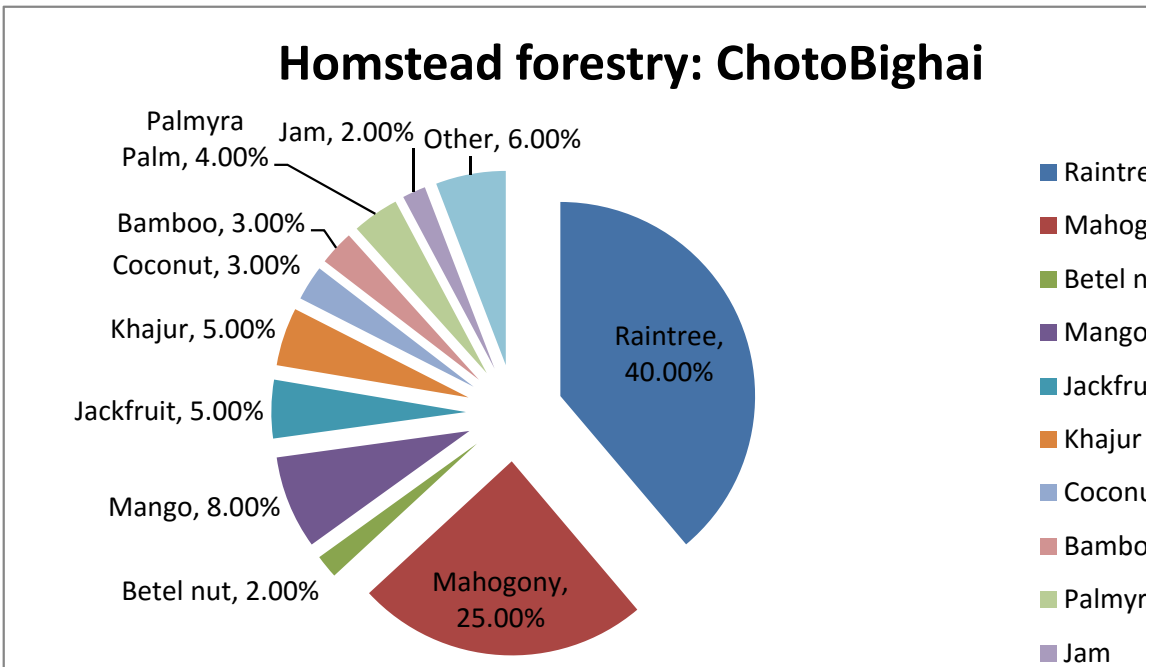
The unions under Patuakhali Sadar upazila are unique in its natural vegetation, homestead/community forest, road side plantation and in wetland floral species.

Homestead/community forestry:

Homestead forest is a forest for the people and by te people, grown on marginal and fallow landof homestead area, beside roads, railway, embankment, river, khal and on fallow highlands characterized by a combination of annual and perennial forest species. The homestead forestry is a promising sector in this area which accounts for 48% of the total supply of saw and veneer logs, 70% of fuel wood in the rural areas,.

In the studied area rain tree occupies highest number among timber species, which is about 45.59%of the total planned forest. The next is Mehogony 24.60%, Betel nut 3.50%, mango 8.5%, jackfruit 3.60%, Khajur 3.80%, coconut 3.40% and other are 7.20%.

The adverse effect of the rain tree as reported by the local people were that it create shado in the nearby crop field as its brunches occupied a huge area and hamper agricultural crop cultivation. It has also negative impact on soil fertility and water quality when poisonous ingredients of decomposed leaves and limbs of rain tree are mixed in nearby agricultural fields, water bodies and ponds. Inspite of these issues it has demand to the villagers as it grow very fast and can sustain under any adverse natural condition.



The land use of Chotobighai union consists mainly of settlements with profuse homestead forest, water bodies, fisheries and agricultural land. Settlements with

community/homestead forestry possess mainly the highland areas above normal flood level which are about 27.85% of the total area of this union.

Chpto Bghi Union at a Glance

1. Establish: 1973
2. Distance from Patuakhali Sadar Upazila through road is about 15 KM.
3. Area: 14.4 Square Kilometer or 37.0 square Kilometer
4. Boundary: Pyara River is at West-North, Guabaria River at east, Boro Bighai Khal is at South, at West Kalikapur and Patuakhali pouroshova.
5. Name of chairman: Mrs. Suily Begum, Mobile- 01725-005839
6. Secretary: Md. Omor Faruk. Mobile- 01714-598027
7. There are 6 (six) Mouja, namely- Tushkhali, Vhagna, Fultola, Mativhanga, Hortokibaria, Chotobighai.
8. No. of Villages: 9 (nine) villages, namely- Tushkhali, Vhagna, Fultola, Mativhanga, Hortokibaria, Chotobighai, katakhali, east Matibhanga and Kumurkhali.
9. Population: 22,092 (Male- 11,532 female- 10,560)
10. Voter (age above 18 years): 12,707
11. Total Agricultural Land: 8,010 Acars (single cropped- 2560 acar, double cropped- 5450 acar)
12. Tuble: Deep- 141, shallow- nill
13. Education rate: 40%
14. Primary school: public 08, private 07
15. Secondary school: 02 private only
16. College: 01 private only
17. Madrasha: 06 Alia & 02 koumi
18. Road length: 05 km paka, 10 Km HBB, 120 km kacha.
19. Number of HH: 4658
20. No. of Market: 05
21. No. of Cyclone centre: 03
22. Govt Sattelment: 02 (220 member)
23. No of Bank: 04 (Krishi bank, grameen bank, Brac bank, ASA)

Population

SL No.	Mouja	Male	Female	Total
01	Jushkhali	2,018	2,054	4,072
02	Mativhanga	2,368	2,437	4,805
03	Choto Bighai	1,476	1,540	3,016
04	Vagna	1,171	1,250	2,421
05	Hortokobaria	3,045	1,587	4,632
Total =				**18,946**

Source: 20/03/2011 Sensus & HouseHold Survey- 2011.

Communication System

Choto Bighai Union is not so far away from Patuakhali district town. It is about 15 Km away. It is possible to go by Rikhsa, Auto or Motor cycle. Easiest way is to go to "Hatalia Badh Ghat" first and cheapest transport is auto, cost only 10 taka. From "Hatalia Badh Ghat" to Choto Bighai union through Auto or Motorcycle per person cost is 50-60 taka.

VGD

VGD Cycle 2013-14, Union – Choto Bighai

Total listed and supported: 186

18.2 Bara Bighai union

General description:

Total land area is 2,854 ha (BBS,2011) of land of which the total cultivable land is 1,912 ha (67%). The number of farmers family is 3,940 where 15% are share croppers. The area under irrigation is only 10%, which is due to surface water salinity in the dry season.

Agriculture

Land Type classification:

Land type is the dominant factors guiding chiece of crops and cropping patterns of any area. Selection of crop or cropping patterns largely depends on the topographic position of land in relation to seasonal inundation depth and its duration. Lands which are above normal inundation level, can provide a wide range of opportunities for growing both perrinial and year round annual dry-land crops.

The major land types of this union are medium high land (75%), and high land (25%), which indicates that most of the land areas remain under moderately monsoon flooding and suitable for wetland crop cultivation.

Cropping Pattern:

The land of tthis area is dominated byy agricultural crop cultivation, which cultivated mainly under rainfed condition. The agricultural practices are mainly depending on favourable natural environment. The present cropping intensity of this union is 214%. The present cropping patterns of this union are shown below:

Name of union	Net Cultivable land (ha)	Major cropping pattern	Cropping intensity	Area (ha)	Remarks
Bara Bighai	1,912	Pulse/Chilli/Oilseed/S.Potato – fallow – T.Aman (LIV/HYV)	214	686	35.88%
		Fallow – T.Aus – T.Aman		305	15.95%
		Spice/Pulse/Oilseed – T.Aus – T. Aman		575	30.07%
		Annual crops (Sugercane/Betel leaf/banana)		20	01.04%
		Fallow – Fallow – T.Aman		286	14.96%
		Vegetable/Others		40	02.10%

Source: Field Survey, 2009-10

Rabi crop cultivated in this area: Chilli, Vegetable, Egg plant, Mungbean, peanut, and Khesari etc.

Major problems:

- Water stagnation/congestion,
- Low organic contents in the soil,
- Soil moisture deficite during the dry months,
- Risk of tidal flood,
- River erosion and saline intrusion.

Fisheries:

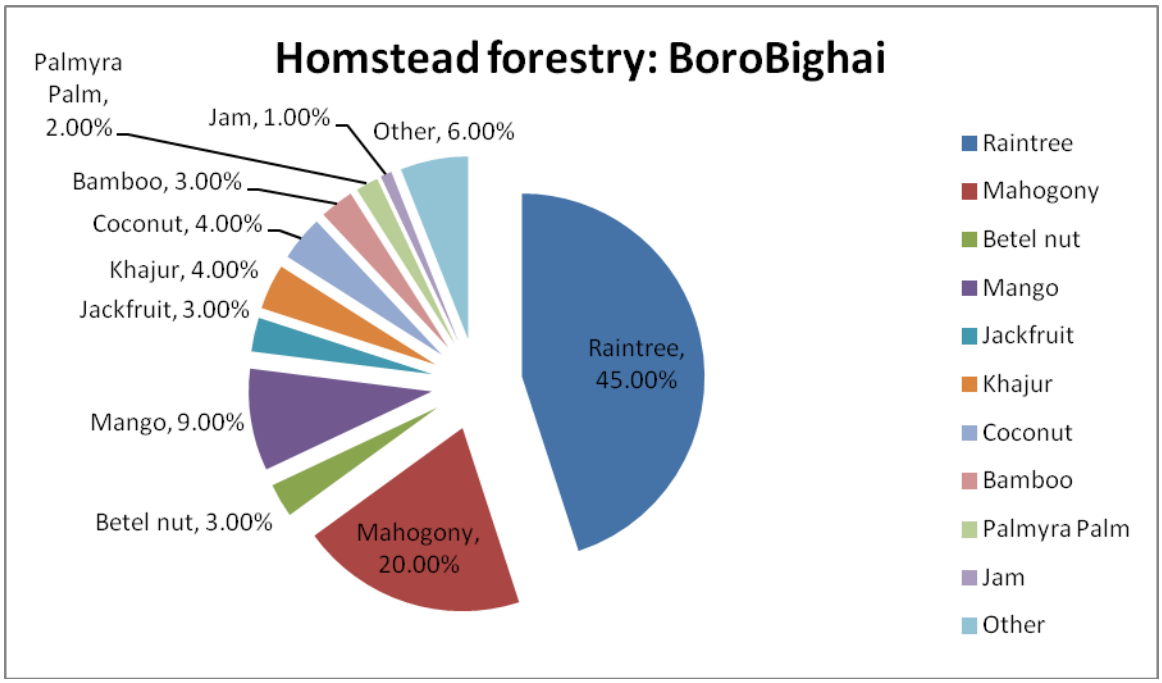
The union has a total wet land area of 583 hectars, of which 125 hectars are under aquaculture. Aqua*culture compraises of homestead pond fish culture in 115 hectars, commercial fish culture 4 hectars and prawn culture was 6 hectars. The open water fisheries consist of river, canal and flood plain with a water area of 558 hectares.*

Wet Land Distribution of Polder 43/2A

Union	*Total Area (ha)*	*Pond Culture*	*Fish Culture*	*Prawn Culture*	*Total Culture*	*Total capture*	*Total Wetland*	*Remarks*
Boro Bighai	*3,444*	*115 (3.34%)*	*04 (0.12%)*	*06 (0.17%)*	*125 (3.63%)*	*458 (13.3%)*	*583 (16.93%)*	

Homstead/ Community Foresty:

Settlement with homestead is being used for combined vegetable and plantation with timber wood fruit, fodder and other cottage industry raw material yielding tree. Raintree occupies a major portion,which is about 45% of total homestead vagitation, the next are roughly mahar 20%, mango 9%, Khajur 4%, jackfruit 3%, bamboo 3%, coconut 4%, palmayra palm 2%, betel leaf 3%, jam 1%, and other are 6% of the total vagitation.



Boro Bighai Union

Established: 1963

Communication

20 km away from Patuakhali Sadar upazila headquarterthrough road

- Total road length: 111 Km where 11 km pacca, 2.25 km HBB and 98 km kacha.
- Area: 29.75 square Kilometer
- Boundary: North- Choto Bighai Union, West- Ayla River, South- gulishakhali River, east- Barunbaria River & Morichbunia union.
- No of Mouja: 05 Mouja, namely- Boro Bighai, South Bighai, Posharibunia, West kawabunia and Titkata.
- No. of Village: 11 Villages, namelt- Borobighai, Jorkhali, South Bighai, Poykka, Patukhali, Saichabunia, Posaribunia, West kawabunia, East kawabunia north Titkata, South Titkata.
- Post Office: 04, Placed- Khatashia Bazar, Boro Bighai, saichabunia, Titkata

- Market: 05, namely- Khatashia Bazar, Boro Bighai officer hat, Bighair Hat, Titkata, Middle Titkata.
- Population: 19,333 (Male- 9,518, Female- 9,881)
- Voter: 11,050 (over 18 years of age)
- Total Household: 5,020
- Cyclone shelter: 04
- Housing facilities for poor: 02 Adersho Gram, 01 ashrayan (150 HH)
- Agricultural land: 7,023 Acar (single cropped- 3,000 acar, 2,000 acar)
- Rate of education: 57%
- No. of primary School: public 15, community- 02.
- Secondary School: Private - 03
- College: Private- 02
- Madresha- No public, Private- 07 (01 Alim, 02 Dakhil, 02 Koumi, other 02)

Village wise Population

Sl No	Name of Village	Population
1	Boro Bighai	2076
2	Jorakhali	2071
3	Patukhali	1051
4	Pokhya	838
5	South Bighai	1505
6	Shaichabunia	819
7	Posaribunia	1646
8	East Kawabunia	2487
9	West Kawabunia	2417
10	North Titkata	2409
11	South Titkata	2080

Communication:

Distance through road from patuakhali district to boro bighai union is about 29.75 killometer.
Main way of transport:

1. Dotor cycle
2. Nosimon bike
3. Riksha
4. Riksha van
5. Auto

Agricultural production: Paddy is the main crop of this union. Among the robi production,

Ngo:

Different ngo work in this area. Some major ngos are-

- Space
- Asa
- Wave foundation
- Brac
- Save the children

Insurance company:

1. Insurance company:
2. National life insurance
3. Popular life insurance
4. Al baraka life infurance
5. Progoti life insurance
6. Baira life insurance
7. Padma life insurance
8. Islami bank insurance
9. Jibon bima corporation

These organizations are serving the community people through their branch offices or agents.

Social safety net program:

Employment generation program for hardcore poor (2012-13)- 310 persons were enlisted in the 2nd phase.

There are 280 listed fishermen who are not getting VGF support in this Union. They have got Hilsha net as input support from gonernment.

VGD (2013-14): for the year 2013-14, 173 women have been listed and getting support from vgd program in boro bighai union.

Aged allounce:

430 old aged people are getting this support under social safetynet program of the government from boro bighai union.

Otist allounce:

46 otist have been listed in this Union and are getting support from government.

List of Market:

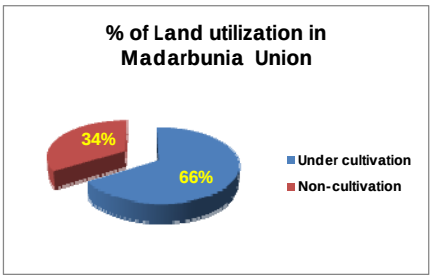
1. Khatasia bazaar
2. Titkata Bazar
3. Boro Bighai Officer hat
4. Boro Bighai hat
5. Middle Kawabunia Bazar
6. Middle Titkata Bazar

18.3 Madarbunia Union

General description

Madarbunia union is comprised of an area of 3098 ha of land, of which the total cultivable land is 2040 ha (67%). The number of farmer's family is 3047 where 40% are share croppers. The area under irrigation is only 5%, which is due to surface water salinity in the dry season. The salinity rate and other natural hazards are increasing day by day. The area is exposed to severe cyclone and storm surges that cause huge suffering in human lives and loss of agricultural crops as well as other assets of the people.

Fig: Land utilization in Madarbunia Union



Land type classification

The major land types of this union are medium high land (75%) and high land (25%), which indicates that most of the land areas remain under moderately monsoon flooding and suitable for wetland crop cultivation. The limited high land is not inundated by monsoon flooding but other areas are inundated by the monsoon flooding for 4 to 5 months at various depths up to 90 cm.

Soils

The soils are moderately to very slow permeable having well to poor moisture retention capacity in the dry season. The soil pH ranges from 5.5-7.5. Soil salinity level ranges from very slightly to moderately saline (2-4 dS/m) and partly strongly saline in dry season.

Cropping pattern

The land of this union is dominated by agricultural crop cultivation, which is cultivated mainly under rainfed condition. The agricultural practices are mainly depending on favorable natural environment. The present cropping intensity of this union is 213% and major cropping patterns of this union are shown below

Table: Cropping pattern of Madarbunia Union

Major cropping pattern	Area (Ha)	% of NCA	Cropping intensity (%)
Pulse/Chilli/Oilseed/S.Potato-Fallow-T.aman (LIV/HYV)	685	34	176
Fallow-T.aus((LIV/HYV)-T.aman (LIV/HYV)	780	38	
Spices/Pulses/oilseed-T.aus(LIV/HYV)-T.aman(LIV/HYV)	384	19	
Annual crops (Sugarcane/Betel leaf/Banana)	45	2	
Fallow-Fallow-T.aman(LIV/HYV)	58	3	
Vegetables/Others	88	4	

Rabi crops cultivated in this union are: Chilli, Vegetables, Eggplant, Mungbean, Kheshari.

Major problems and its impact

- The major problems of this union are:

- Water stagnation/drainage congestion
- Low organic matter content in soil
- Soil moisture deficit during the dry months
- Essential plant nutrient deficiency
- Risk of tidal flood
- River erosion
- Saline water intrusion
- Flood occurred frequently and causes degradation of natural vegetation and loss of agricultural crops

18.4 Questionnaire for FGD and KII

Blue Gold Program

Business Development Component (C-4)

Questionnaire for interviews of Input sellers

Polder Number: _____

Date of interview: _____

GENERAL INFORMATION OF THE RESPONDENT

Name of Respondent : _____

Designation : _____

Name of Enterprise : _____

Contract Number : _____

Address : _____

_____

_____

1. Agriculture Inputs Seller (Seeds)

a. What types seeds (Major) you sell?

Name of crop _____, Variety _____, _____, _____, _____

Name of crop _____, Variety _____, _____, _____, _____

Name of crop _____, Variety _____, _____, _____, _____

Name of crop _____, Variety _____, _____, _____, _____

Name of crop _____, Variety _____, _____, _____, _____

Name of crop _____, Variety _____, _____, _____, _____ _

Name of crop _____, Variety _____, _____, _____, _____

Name of crop _____, Variety _____, _____, _____, _____

Name of crop _____, Variety _____, _____, _____, _____

Name of crop _____, Variety _____, _____, _____, _____

b. Where do you get/collect seeds?

Company's seeds/ Own produced seeds/ Collect from Farmers/ Other Sources

Name of Companies _____, _____, _____, _____ , _____ **c.**

Which crops/Seeds have more demand (Seed demand of major crops)?

Name of seeds_____, Variety _____, Demand _____ Kg

Name of seeds_____, Variety _____, Demand _____ Kg

Name of seeds_____, Variety _____, Demand _____ Kg

Name of seeds_____, Variety _____, Demand _____ Kg

Name of seeds_____, Variety _____, Demand _____ Kg

Name of seeds_____, Variety _____, Demand _____ Kg

Name of seeds_____, Variety _____, Demand _____ Kg

Name of seeds_____, Variety _____, Demand _____ Kg

d. How much you meet the demand of major seeds?

Name of crop _____ Sold _____kg, Name of crop _____ _ Sold _____kg,

Name of crop _____ Sold _____kg, Name of crop _____ _ Sold _____kg,

Name of crop _____ Sold _____kg, Name of crop _____ _ Sold _____kg,

Name of crop _____ Sold _____kg, Name of crop _____ _ Sold _____kg,

Name of crop _____ Sold _____kg, Name of crop _____ _ Sold _____kg

Name of crop _____ Sold _____kg, Name of crop _____ _ Sold _____kg

e. How much yearly turnover of you? About BDT _____/ year

f. How much Farmers buy seeds from you?

g. What is your concern and recommendation about the quality of seeds?

h. How do you conform about the quality of seeds?

i. When is the pick period for seeds business?

Period: _____ to _____ ; _____ to _____ & _____ to _____

Transaction amount in the pick season:

j. Is there any complain of about seeds' quality?

K. What types of complain you get about seed's quality?

l. How do you manage the raised complain?

m. What will be the good solution (as your consideration)? How ensure the good quality seeds?

3. Finance and Income

a. Where do you usually get financial support?

Govt. Bank/Private Bank/ NGO/ Local Money investor/ Relatives/Others

b. Is their interest rate rational?

c. Is there any others way to get financial support to run the business?

d. Is there any scope to expand the present business/ increase market share and how?

e. Overall comments about seeds business:

4. Agriculture Inputs Seller (Fertilizer & Pesticides)

a. What type fertilizers (Major) you sell?

b. What type pesticides (Major) you sell?

Insecticides:

Fungicides:

Herbicide:

b. Where do you get/collect pesticides?

Name of Company:

Name of Distributor:

Whole sellers/Dealer:

d. How much you meet the demand of pesticides?

e. How much yearly turnover of you? About BDT _____/ year

f. How much Farmers buy pesticides from you?

g. What is your concern and recommendation about the quality of fertilizers?

h. How do you conform about the quality of fertilizers?

i. When is the pick period for pesticides business?

Period: _____ to _____ ; _____ to _____ & _____ to _____

Transaction amount in the pick season:

j. Is there any complain of about fertilizers' quality?

K. What types of complain you get about fertilizer's quality?

l. How do you manage the raised complain?

m. What will be the good solution (as your consideration)? How ensure the good quality seeds?

5. Finance and Income

a. Where do you usually get financial support?

Govt. Bank/Private Bank/ NGO/ Local Money investor/ Relatives/Others

b. Is their interest rate rational?

c. Is there any others way to get financial support to run the business?

d. Is there any scope to expand the present business/ increase market share and how?

e. Overall comments about seeds business:

6. Fish Inputs Seller (Feed & Medicine)

a. What type feeds (Major) you sell?

Name of Brand and company:

Name of Brand and company:

Name of Brand and company:

Name of Brand and company:

Name of Brand and company:

Name of Brand and company:

b. What type medicine (Major) you sell?

Name of Brand and company:

Name of Brand and company:

Name of Brand and company:

Name of Brand and company:

Name of Brand and company:

Name of Brand and company:

b. Where do you get/collect feed and medicines?

Name of Company:

Name of Distributor:

Whole sellers/Dealer:

c. How much you meet the demand of fish feed?

d. How much yearly turnover of you? About BDT _____/ year

e. How much Farmers buy fish feed from you?

f. What is your concern and recommendation about the quality of fish feed and medicine?

g. How do you conform about the quality of fish feed?

h. When is the pick period for fish feed business?

Period: _____ to _____ ; _____ to _____ & _____ to _____

Transaction amount in the pick season:

i. Is there any complain of about quality of fish feed?

j. What types of complain you get about feed's quality?

k. How do you manage the raised complain?

l. What will be the good solution (as your consideration)? How ensure the good quality seeds?

5. Finance and Income

a. Where do you usually get financial support?

Govt. Bank/Private Bank/ NGO/ Local Money investor/ Relatives/Others

b. Is their interest rate rational?

c. Is there any others way/means to get financial support to run the business?

d. Is there any scope to expand the present business/ increase market share and how?

e. Overall comments about fish feed business:

Blue Gold Program

Business Development Component (C-4)

Questionnaire for interviews of Hat/Bazar Toll collector

Polder Number: _____

Date of interview: _____

GENERAL INFORMATION OF THE RESPONDENT

Name of Respondent : _____

Designation : _____

Name of Enterprise : _____

Contract Number : _____

Address : _____

_____

_____

1. What day held the hat/bazaar?

2. How much outside buyers come for Mung bean purchase?

3. How much local buyers for Mung bean purchase?

4. How much amount (mt) of Mung bean transacted at the market day?

5. What is the Price of Mung bean? BDT _____/mt.

6. What is the toll rate for mung bean?

7. Where go the Commodity (Mung bean)?

Blue Gold Program

Business Development Component (C-4)

Questionnaire for interviews of Service providers/SAAO

Polder Number: _____

Date of interview: _____

GENERAL INFORMATION OF SERVICE PRODUCERS/ SAAO

Name of Service provider : _____

Designation : _____

Contact Number : _____

Address : _____

_____

_____

_____

1. Geographical Location of the Polder

North: South:

West: East:

List of Villages:

2. Source of Water for Irrigation

a. How many hectare of land under irrigation?

b. What are the main sources of water for irrigation?

c. Have any problem about irrigation?

d. What is the quality of underground water?

e. What are the problems of irrigation water?

f. What will be the solutions?

3. Agriculture Land Information

a. What is the land topography?

High land ---------- ha, Medium high land ---------- ha, Low land---------- ha, Very low land ---------- ha

b. What are the land types?

Clay ---------- ha, Clay loom---------- ha, Loom ---------- ha, Slit loom ---------- ha, Sandy loom ---------- ha, Sandy ---------- ha

4. Land utilization

Single crop land ---------- ha, Double crop land ---------- ha, Triple crop land ---------- ha

a. What about major crop wise land distribution?

i. T-Aman Rice: _____ ha, ii. Boro Rice _____ ha, iii, Pulse (Mung bean, Lentil, ----------) _____ ha, Oil seed (_----------)

_____ ha, Vegetables (----------)

_____ ha, Others _____

_____

ii. What about Homestead Land?

a. Total Area _____ ha, Maximum (individual) area _____ dec., Minimum (individual) area_____ dec., Average area _____ dec.

5. Land Ownership and Farm size

a. What are the ownership types of cultivated land?

Own ownership _____ ha, Lease (>1year)_____ha, Lease (for 1year)_____ha, Share cropped _____ ha, Others_____

b. What is the classification of HHs based on their farm size?

Large/big farmer no._____ land size _____ _____, Medium no. _____ land size _____ _____, Small farmer no. _____ land size _____ _____, Marginal farmer no. _____ land size _____ _____, Landless farmer no. _____ land size _____ _____, and Other (local classification) land size _____ _____

6. Homestead related information

a. Total homestead area? _____ ha

b. What types of major crops are produced at homestead and their amount?

c. What types of input required for homestead productions?

d. How much seeds required for homestead productions?

e. How much fertilizers required for homestead agri. productions?

7. Agriculture production (Field crop)

a. What are the major cropping patterns (Systems)?

i.

ii.

iii.

iv.

v.

b. What is the production of Major crops?

Name of crop_____, Total Production _____ mt, Production share _____ %

Name of crop_____, Total Production _____ mt, Production share _____ %

Name of crop_____, Total Production _____ mt, Production share _____ %

Name of crop_____, Total Production _____ mt, Production share _____ %

Name of crop_____, Total Production _____ mt, Production share _____ %

Name of crop_____, Total Production _____ mt, Production share _____ %

c. What is the supply chain facilities/backward linkages?

- ❒ Where do farmers get seeds?
- ❒ How do farmers know the quality seeds?
- ❒ Where do farmers get fertilizers?
- ❒ How do farmers know the quality fertilizers?
- ❒ How much Seed Dealers in this polder (43/2A, 2D, 2F)?

d. What are the demands of major seeds?

Name of seeds _____, Demand _____ kg, Name of seeds_____, Demand

_____ kg, Name of seeds _____, Demand _____ kg,

Name of seeds_____, Demand _____ kg, Name of seeds _____, Demand

_____ kg, Name of seeds _____, Demand _____ kg,

Name of seeds _____, Demand _____ kg,

e. How do meet-up the major seeds' demands?

Name of crop _____, Total demand _____kg, Own sources_____, Purchase from market_____; Name of crop _____, Total demand _____kg, Own sources_____, Purchase from market_____ ; Name of crop _____, Total demand _____kg, Own sources_____, Purchase from market_____; Name of crop _____, Total demand _____kg, Own sources_____, Purchase from market_____

f. What is your concern and recommendation about quality of presently used seeds?

g. How may available quality seeds in the locality (as consideration)?

h. What is your concern and recommendation about the quality of presently used fertilizers?

i. What are the main challenges/problems do you think on crop cultivation at polder 43/2A, 2D, 2F?

j. How overcome the above stated challenges/problems?

8. Information regarding Labor distribution

Total labor forces _____, Agriculture _____, Fish culture/fishing_____,

Livestock rearing _____, Wage sells in non-agri. work_____, others _____

_____ _____ _____ _____ _____

a. Where (in which sector) do needed major labor required?

9. Market/Business related information

a. How much selling spots/market (Hat, Bazar) in Polder 43/2A, 2D, 2F?

b. How much amount of major commodities is transitioned in each market day at selling point?

Name of commodity_____, amount _____ mt; Name of commodity

_____, amount _____ mt; Name of commodity_____,

amount _____ mt; Name of commodity_____, amount _____

mt; Name of commodity_____, amount _____ mt

c. Who are the main buyers (selected 2-3 commodities) and what no. of them?

d. What is the procurement system? Credit sale _____, Cash_____, Other _____

e. Do you think that producers/farmers are getting fair price?

f. If not, then why?

g. What may be done for getting fair price?

h. Have any processer (formal market) and who, where?

g. Is there any barriers for farmers to access in these markets (Tax, toll, levies, syndicate etc.)?

h. Have any distance market and farmers get access in that market?

i. Do you think market is saturated or demand not fulfills (some selected commodity)?

10. Gender related Information

a. Do the Women involve with agriculture production? Yes ☐ No ☐

b. Which activities are performed by women?

c. Is there any problem to do their jobs?

d. Is there any scope of women to involve with business activities?

e. If yes. What types of problems/issues may arise?

f. How may solve the raised problems/issues?

11. Consumption related information

a. How much amount consumed of production by the HH members?

Rice_____; Pulse_____; Oil seeds _____; Vegetables _____

Specially Mung bean _____

12. Further improvement of Mung bean

a. What are the existing used varieties of Mung bean? Local □ Gorjon □ HYV □ BARI □ others ……..

b. Is the present used seeds enough for quality?

c. Is there any gap in cultivation practices?

d. How overcome the gaps?

13. Finance and Income

a. Where usually farmers get financial support?

b. Is their interest rate rational?

c. Is there any others way to give financial support to the producers/farmers?

d. Do the Mung bean cultivation is profitable?

e. Do you have any idea to improve mung bean cultivation for making profitable?

Blue Gold Program

Business Development Component (C-4)

Questionnaire for interviews of Fish Service providers/DOF

Polder Number: _____

Date of interview: _____

GENERAL INFORMATION OF FIDH SERVICE PRODUCERS/ DOF

Name of Service provider : _____

Designation : _____

Contact Number : _____

Address : _____

_____

_____

_____

1.Aquaculture Resources

A. Water body and farmers

Ponds no. _____ Water body/area _____ ha; Khal/Cannel no. _____, area _____ ha,

Gher no. _____, area _____ ha; Fish farmers total no. _____, Tilapia farmers no. _____,

Cultured area _____ ha, Pangas farmers no. _____, cultured area_____ ha, Carps'

farmers no. _____, Cultured area _____ ha, others farmers no. _____, area _____ ha

B. Fish Seeds/Fry/Fingerlings Sources

Hatchery no. _____, Production capacity _____ _____

Nursery no. _____ , Production/Capacity _____ _____

Ice factory no. _____, Capacity _____, Fish selling points no. _____

Fish market no. _____, Processing plant no. _____, Capacity _____ No. of Fry traders_____, No. of Fish feed sellers _____, No. of Fish medicine sellers _____ , others inputs (Lime, fertilizers, oil cake etc.) sellers no. _____

2. Input supply chain related information

a. where do farmers get fish fry/fingerlings/seeds?

- **How much no. of Fry/fingerlings sellers?**
- **How much they sell?**

b. Is the available fish fry/fingerlings/seeds are good quality?

c. What do you think fish fry/fingerlings/seeds price? Is it fair or not?

d. What are the problems to get the good quality fish seed/fry/fingerlings?

e. How may overcome the mentioned problems?

f. Where does farmer get fish feeds?

- **How much no. of feed sellers?**
- **What amount they sell?**

g. Do the available fish feeds are good quality?

h. How do farmers know the good quality feed?

g. Does the price of fish feed is fair?

3. Production related information

a. What types of fish are cultured in Polder 43/2A, 2D, 2F?

b. Information about major species

Total cultured area _____ha, total fish production _____ mt, Yield _____ mt/ha

Tilapia: area_____ ha, Yield (mt/ha) _____, Total production _____ mt

Pangus: area_____ ha, Yield (mt/ha) _____, Total production _____ mt

Common Carp: area_____ ha, Yield (mt/ha) _____, Total production _____ mt

Indigenous species: area_____ ha, Yield (mt/ha) _____, Total production _____ mt

Prawn/shrimp: area_____ ha, Yield (mt/ha) _____, Total production _____ mt.

Others (_____): area_____ ha, Yield (mt/ha) _____, Total production _____ mt.

c. What's amount demand of Tiliapia fry?

d. How much amount feed demand in this polder?

5 Ownership types and Farm size

a. What are the ownership types of cultivated land?

Own pond _____ ha, Lease (>1year)_____ha, Lease (for 1year)_____ha,

Others_____

b. What is the pond size?

Large/big pond no._____ pond size _____ to _____ dec., Medium pond no. _____

pond size _____ _____dec., Small pond no. _____ pond size _____ _____ dec.,

very small pond no. _____ pond size _____ _____ dec. and Other classification

(_____)pond no. _____, pond size _____ _____ dec.

6. Output related information

a. Where do farmers sell their fish? No. of markets/selling points _____, names

_____

_____

_____

b. What is the transaction volume of fish in each market day? _____ mt/market day

c. How much buyers are present in the market?

Local buyers/Bapary no. _____, Out sider buyers/Bapary no. _____, Retailers no. _____

d. Do you think Farmers (Producers) get fair price?

e. If not. What may be the causes for not getting fair price?

f. How do farmers could get fair price (as your consideration)?

d. What is the procurement/payment system? Credit sale _____, Cash sale_____,

Other_____

6. Challenges/ problems in Tilapia culture

a. What are the major challenges/problems in Tilapia culture?

b. How can be overcome the above mentioned problems/challenges?

c. What may be the opportunity in Tilapia culture?

11. Consumption related information

a. How much amount consumed of produced fish (%) by the HH members?

b.

13. Finance and Income

a. Where usually farmers get financial support for fish culture?

b. Is there any problem to get financial support from IMF?

c. Do you think that NGO's loan is higher interest?

d. Do you think Tilapia cultivation is profitable?

e. Do you have any idea to improve Tilapia culture for making profit?

Blue Gold Program

Business Development Component (C-4)

Questionnaire- for interviews of Fish farmers

Polder Number: _____

Date of interview: _____

GENERAL BACKGROUND OF THE FISH FARMERS

Farmer's Name : _____

Father's Name : _____

Contact Number : _____

Village : _____

Union : _____

WMG Name : _____

Upazilla : _____

District : _____

1. Identification of Respondent

a. Female □ Male □ Youth □ Adult □

Age_____

b. Woman (single) □ Woman married □ Man single □ Man married □

c. Main income sources of household?

_____

d. Landowning household: Yes □ No □ if yes, how much land (Decimal)?

_____

If yes, who in your household owns the land?

_____

2. Production

g. In how many decimal of pond do you culture/rear fish/fingerling?

_____

h. What are the main challenges/problems do you face in Fish culture? _____

_____

_____

_____

_____

_____

_____

_____

i. What type of seed/fingerling/fry/spawn do you generally use?

Local □ Mono sex □ GIFT □ BFRI □ others .....

Why or why not?

_____

____

j. Do you change water? Yes □ No □

why or why not ?

_____

_____

_____

_____

k. Do you provide slary/fertilizer/other input? Yes □ No □

Why or why not?

No money to pay □ too expensive □ not available □ Don't know what is good □

Others
(explain):_____
___

_____

_____

l. What is your Tilapia/fish production per year? Per Decimal?

_____

m. Where can you get information about better cultivation practice? Television □ Radio □

Leaflet □ Posters □ Religious Leader □ Newspaper □ Seed seller □ SAAO □

Schools □ Friends/Neighbors □ NGO □ Bepari/Faria/Agent □ Other:

_____

_____

_____

n. Do you have preserve/storage facility for Tilapia/fish? Yes□ No□

o. Who take the decision regarding Tilapia/fish sales? How?

p. How do you determine the right Price for Tilapia/fish?

3. Support Service regarding Production Technology/Use of proper inputs related Questions

a. Are support services (regarding production/input) available? Yes□ No□

b. Where you find them? DAE □ NGO□ Others□

c. What services? (explain) _____

_____

_____

d. Do you have to pay for services? _____

_____

_____

e. What do you think about the quality of the services

_____

_____

_____

4. Selling / Consumption Questions

a. Do you sell Tilapia/fish? Yes □ No □ Occasionally □

If occasionally, selling season(s):

If yes, how much quantity (kg): _____ Sales price (per kg, Last year) (Tk.): _____

_____

_____

b. To whom do you sell the Tilapia/fish/fingerling (could be to multiple buyers)? Other Households □ Traders/Bepari/Paiker/Agent/Faria/Collector □ Cooperative □ Collection Centre/Aroth □ Candy maker □ Processor □ Others (explain)_____

_____

_____

c. Have you built any relationship with your buyer (any verbal/written contract)? _____

_____

_____

_____

d. If you sell Tilapia/fish/fingerling/fry/spawn to outside market, how far is the selling place? _____

_____

_____

e. How do you go to that market place (means of transport)? And required time and cost for it: _____

_____

_____

_____

f. Who determines the price of your Tilapia/fish/fingerling/fry and How (if he knows how)?

_____

_____

_____

_____

g. Is there any price fluctuation occurs? Yes □ No □

If yes, why and when?

_____

_____

_____

h. Are you satisfied with your Tilapia/fish/fingerling/fry/spawn selling price? Yes □ No □

reason_____

_____

_____

_____

_____

i. What problems do you face in selling your Tilapia/fish/fingerling/fry/spawn?

Low price □ No buyers □ No appropriate grading □ Fish is poor quality □ Moisture content/foreign material □ No transportation □ Long distance to market □ Other (explain): _____

_____

_____

j. Do you sell Tilapia/fish/fingerling/fry/spawn year round? Yes □

No □

If no, then why?

_____

_____

_____

k. If you consume Tilapia/fish, at how much quantity do you keep for it?

_____

l. How do you make this decision?

_____

_____

_____

m. Who sells the Tilapia/fish/fingerling/fry?

Husband □ Wife □ Female household head □ Other

(explain) _____

_____

_____

5. Ownership / Income /Finance Questions

a. Who are the owners of the income from Tilapia/fish/fingerling/fry/spawn?

_____

b. Who controls the income coming from sale? Husband □ Wife □ Jointly (husband and wife both) □Other (explain) _____

c. Do any other family member can play role for decision making in spending the income coming from sale?

Yes □ No □ If yes, who

_____

d. Do you know about any money lending/micro-credit organization in your area? Yes □ No □

If yes, who are they?

_____

_____

_____

_____

e. Do you need credit? Yes □ No □ If yes, do you have access to that credit service?

Yes □ No □

If no, then why?

_____

_____

_____

_____

f. If you have had the credit/loan, what is the interest rate?

_____

For what purpose you use the lend money?

_____

Do you face any problem in getting loan (explain):

_____

_____

_____

g. Who make the decision on taking and spending of credit/loan?

Husband □ Wife □ Others

_____

6. Environmental Questions

a. What do you do with the residue of fish (plant/Seed)?

_____

_____

_____

b. What are the main weather shocks/natural disasters in this polder that you experienced during Tilapia/fish/fingerling/fry/spawn culture period?

_____

_____

_____

_____

c. Do you think salinity is a problem for Tilapia/fish culture?

7. General Questions

a. Do you face any other problem(s) regarding your Tilapia/fish production/sales?

_____

_____

_____Is there any producer groups/cooperatives? Yes □

No □

b. Are you a member of those groups/cooperatives? Yes □ No □

If yes, what type of service do you get from that?

_____

_____

_____

c. Please comment on Tilapia/fish/fingerling/fry/spawn?

Interviewer Name: _____ Signature :----------: Date: