

**MASTER FILE  
OF  
POLDER 43/1A  
BLUE GOLD PROGRAM  
PATUAKHALI**

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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**

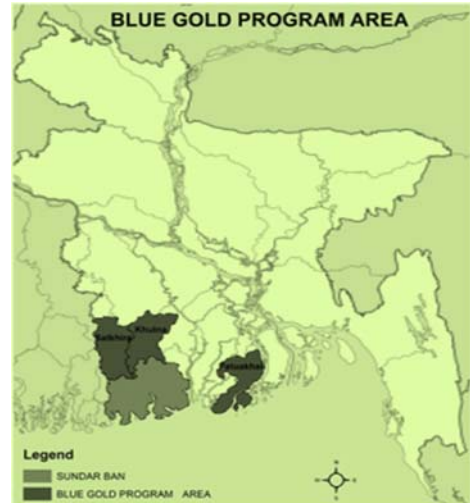
BADC	Bangladesh Agriculture Development Cooperation
VC	Value Chain
BARI	Bangladesh Agriculture Research Institute
BINA	Bangladesh Institute of Nuclear Agriculture
BRI	Bangladesh Rice Research Institute
BWDB	Bangladesh Water Development Board
DAE	Department of Agriculture Extension
DLS	Department of Livestock 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
WFC	World Fish Center
UP	Union Paisad
LGED	Local Government & Engineering Department
IPSWAM	Integrate Planning for Sustainable Water Management
RFLDC	Regional Fisheries & Livestock Development Component
AEC	Agricultural Extension Component
ICM	Integrated Crop Management
IPM	Integrated Pest Management

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DoC	Department of Cooperative
IGA	Income Generating Activity
CSISA-MI	Cereal Systems Initiative for South Asia – Mechanization and Irrigation project
O&M	Operation & Maintenance
TNA	Training Need Assessment
WMO	Water Management Organization
M&E	Monitoring and Evaluation
PDP	Polder Development Plan
BBS	Bangladesh Bureau of Statistics
HH	House Hold
VDP	Village Defense Party
ASA	Association for Social Advancement
CODEC	Community Development Center
USAID	<i>The</i> United States Agency for International Development
BINA	Bangladesh Institute of Nuclear Agriculture
BARI	Bangladesh Agriculture Research Institute
BRAC	Bangladesh Rural Advancement Committee
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 leading 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 objectives of the Program

- Prepare as a Source of information for polder 43/1A
- 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.

*Source: Program document*

## 1.3 Program Components

Blue Gold Program consists of 4 functional components and one support component working in cross cutting issues. All the components are main functional organs of the Program. Describing the activities of the components are as below:

### Component 1: Community Mobilization and Institutional Strengthening

The IPSWAM polders have 246 WMGs that are registered under the Cooperative Societies Act and these are mainly focused on routine operation and maintenance (O&M) of the water management infrastructures. While substantive work has been successfully carried out in organizing the communities to form WMGs, and WMAs at the polder level, as well as in carrying out routine O&M work in joint collaboration with the Bangladesh Water Development Board (BWDB), further development is necessary to engage the communities in sustainable socio-economic development activities. In addition to the 246 WMG cooperatives, the Blue Gold

program is tasked to form new 600 WMG cooperatives and strengthen these to jointly manage the water management infrastructures, engage in economic activities, and enter into market transactions within the local territories or with outside parties in order to enhance production income levels, raise the standard of living and sustain the environment. The cooperatives need to develop into private business enterprises and be able to operate at a commercially feasible and solvent manner.

### **Component 2: Water Resources Management**

Water Resource Management component is ascertain flood protection in polders with gross area of approximately 25,000 ha in total by rehabilitation of the embankments and water intakes and outlets and an improved water distribution and drainage system. This component work in support polder dwellers in optimal use of the water resources for the productive sectors through the fine-tuning of the drainage and water distribution system for 45,000 ha of IPSWAM polders and 90,000 ha already rehabilitated polders. The partnership between BWDB and WMGs/WMAs is effectively operational resulting in continuous and high standard O&M works and effective water management. BWDB zonal offices are applying the IPSWARM guidelines (six steps approach); the planning, design, tendering, and construction are conducted following the highest standards of quality.

### **Component 3: Food Security and Agricultural Production**

Following the rehabilitation or fine tuning of water management in the polders (Component 2) and effective Operation and Maintenance by functional Water Management Organizations (Component 1), Component 3 will support the productive sectors (crops, aquaculture and livestock) so that performance will be higher for the benefit of male and female producers.

Immediate objectives are that production of the agricultural sectors will be increased, which will contribute to higher income and improved food security of the target population. Improved water management will create opportunities for diversification of agricultural production, such as the introduction of new crops or varieties, and for increasing production of fish and livestock. Improved technologies, such as farm mechanization and irrigation, will improve farm efficiency and increase productivity.

Farmer groups will benefit from more effective research and extension services. The Farmer Field School (FFS) approach will be used to offer a wide range of learning opportunities to WMGs, based on their resources, wishes and opportunities. Some of the more advanced FFS groups will form commodity based producer groups, which with support by Component 4 can become more market oriented and can benefit from stronger value chains with improved input supply and marketing of their produce.

### **Component 4: Business Development**

The basic premise of the Blue Gold Program is the rehabilitation of infrastructure to facilitate appropriate water resource management and the subsequent increase of agricultural productivity. The Business Development Component supports the farming households, their association and other market actors to capture the full benefit of this increase in polder productivity. This component seeks to enhance the market linkages and systems, to identify opportunities for value adding and to develop enterprises through value chain improvements to the benefit of the polder community.



Ultimately the objective is to increase farm household income from agricultural production, generate business income and expand employment to improve livelihoods and reduce poverty through market orientation and development. This will result in producer groups which farm on a more market oriented basis and pursue collective actions and benefit from better linkages with respect to inputs, processing and marketing, along with improved public and private services providers. Simultaneously, businesses will generate higher incomes and non-farm employment.

## **Component 5: Cross Cutting Issues**

### **I. Training and Capacity Building**

Training and capacity building in the directly involved institutions and in particular the WMOs is a key factor for a successful implementation of Blue Gold. Multiple training activities will be developed based on a thorough Training Needs Assessment (TNA), comprising all Program implementers, notably members of the WMOs, BWDB, DAE and the other partner GoB-agencies (DoC, DoF and DLS). In addition, the TNA will collect information about on-going or planned training by other projects in the area in order to avoid duplication and to explore ways and means to combine and share training activities.

### **II. Gender**

The purpose of the gender approach of Blue Gold is enhancing the participation of women and men (i) to enable men and women benefiting more equally from the interventions by the program in terms of increased food security and livelihoods, increased socio-economic status and participation in decision-making and (ii) to improve the program's performance and increase the likelihood of sustainability. Blue Gold's Gender Approach builds on experiences in earlier projects, in particularly IPSWAM. Gender perspectives are mainstreamed in the four main components of Blue Gold, as well as in other cross-cutting issues where relevant, such as Disaster Risk Reduction.

### **III. Monitoring & Evaluation**

The M&E team will develop a participatory monitoring system for all Program components, together with the component leaders. They will organise the collection of information required for the proper operation of the monitoring system, impact assessments and evaluations. They will also report on progress per component and on constraints experienced during implementation. The M&E team plays a coordinating role in assisting with the compilation of Program Progress Reports and in the design and implementation of the Blue Gold comprehensive base-line survey of which the first part is planned to be carried out between September and December 2013.

### **IV. Environment**

The overall objective of the environmental concern of Blue Gold is to reduce environmental degradation through adoption of various measures for sustenance of environmental good practices throughout the project life and beyond. Some of the specific objectives include: a) environmental awareness building at WMO level; b) capacity building of the local stakeholders to reduce environmental degradation; and c) creation of an environmentally friendly situation for improved life and livelihood through the Blue Gold interventions (notably in Component 2 – Water Management). These objectives will be met through preparation of environmental management

and monitoring plans, conducting training for environmental awareness building, and formulation and implementation of Sustainable Environmental Management Plans (SEMP) as part of the Polder Development Plans.

V. Disaster Risk Reduction (DRR)

Blue Gold is implemented in the south western coastal districts where natural hazards are manifold. Cyclones, storm surges, salinity intrusion, siltation, drainage congestion are some of the common natural hazards faced in this area. Climate change adds a new dimension to the existing community risk and vulnerability as this could substantially increase the frequency and intensity of existing adverse climatic events. As a cross cutting issue climate change and Disaster Risk Reduction (DRR) will be mainstreamed into the activities of the four components of Blue Gold.

VI. Innovation

Introducing innovative technologies and approaches to accelerate the development process in the Program area is one of the spearheads of Blue Gold. Two separate Innovation Funds are created within Blue Gold, one with focus on water management and the other one for the productive sectors (food security and business development). Innovations may emerge from other projects/programs or organizations in Bangladesh, or from Dutch (knowledge) institutions or enterprises. Potential innovative technologies and approaches include

*Source: Inception Report of Blue Gold Program*

**1.4 Program’s contribution to Millenium Development Goals (MGD)**

The coastal region is prioritized in the **Millennium Development Goals** (MDGs), as an area of “high vulnerability to natural disasters and persistence in severe poverty and hardship; and, as pocket where “livelihood options are limited”. The MDG target for the proportion of rural population with access to safe drinking water by 2015 is 96.5% and that with access to sanitary latrines is 55.5%.

**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 modes of activities. 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 43/1A to design component-

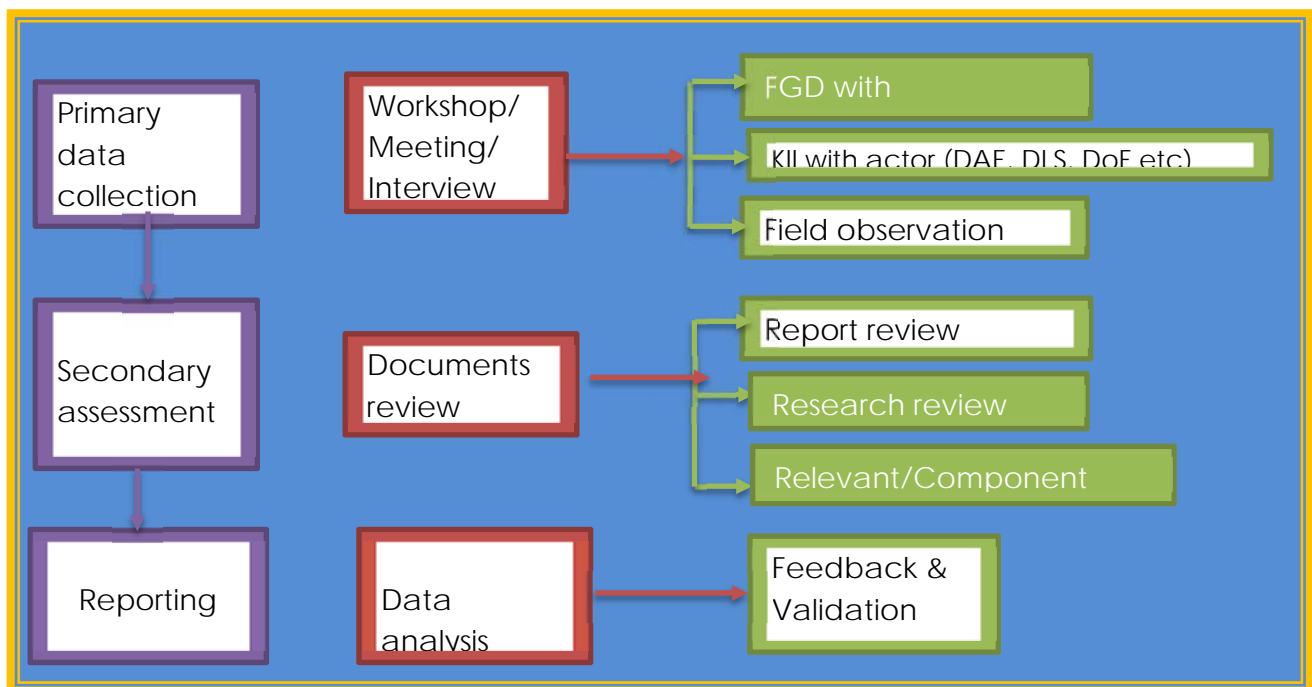


Pic: FGD

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, scope for strengthening in the system at the polder area in a win-win situation. This master file will enable component-04 to design a program in which an optimal combination of quick wins and longer term interventions are combined.

## 2.1 Methodology of preparing master file

This master file has been prepared by use different methodology such as, primary data collection by conducting meeting, workshop, 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, and submitted to all concern staff for giving the valuable feedback and suggestion. 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.

## 3.0 Program area

- ✚ The Program will operate in three districts: Patuakhali, Khulna and Satkhira which are part of the South-west and South-central hydrological zones (see map). The limited number of districts will allow for an effective collaboration with the public and private development partners. Whenever possible all polders in these districts will participate in the Program, however, the polders under rehabilitation by WMIP will not be included.
- ✚ The total land area of the three districts is 11,463 km<sup>2</sup> and the total population is 5.6 million people. This gives an average population density of 493 people per square kilometer and an average household size of 4.3 persons (Table 2.1).
- ✚ According to the Bangladesh Bureau of Statistics“ (BBS) Household Income and Expenditure Survey of 2005 and Population Census of 2001, 27% of the population of Barisal Division and 15 per cent of the population of Khulna Division are living in “extreme poverty” and 12% and 17% respectively in “absolute poverty”. The total proportion of the poor population, with a minimum dietary energy consumption of 2,122 kcal/capita/day, is 39 and 32% respectively. In the 24 Upazilas in Patuakhali, Khulna and Satkhira districts one-third of the population is below the lower poverty line (of extreme poverty), and more than one-half are below the upper poverty line (of absolute poverty).
- ✚ The TA-consultant together with the BWDB will make the final selection of the polders. Three types of polders, depending on their development phase, will be distinguished:
- ✚ The rehabilitated polders where community mobilisation has to be introduced as well food security, business development and livelihood improvement. Fine-tuning of the water infrastructure will be designed and implemented in full participation of the WMG. It has been agreed that the polders under the on-going programmes of Coastal Embankment Improvement Project (CEIP) and of Emergency Coastal Polder Rehabilitation Project (ECRRP) could be included in Blue Gold.

**Table 3.1: Area and Population of the Districts in the Blue Gold Program Area**

District	Area (km <sup>2</sup> )	Household (HH)	Population	HH Size	Population Density (/km <sup>2</sup> )
Patuakhali	3,220	347,000	1,517,000	4.4	471
Khulna	4,395	546,000	2,294,000	4.2	522
Satkhira	3,858	419,000	1,843,000	4.4	477
<b>Total</b>	<b>11,463</b>	<b>1,312,000</b>	<b>5,654,000</b>	<b>4.3</b>	<b>493</b>

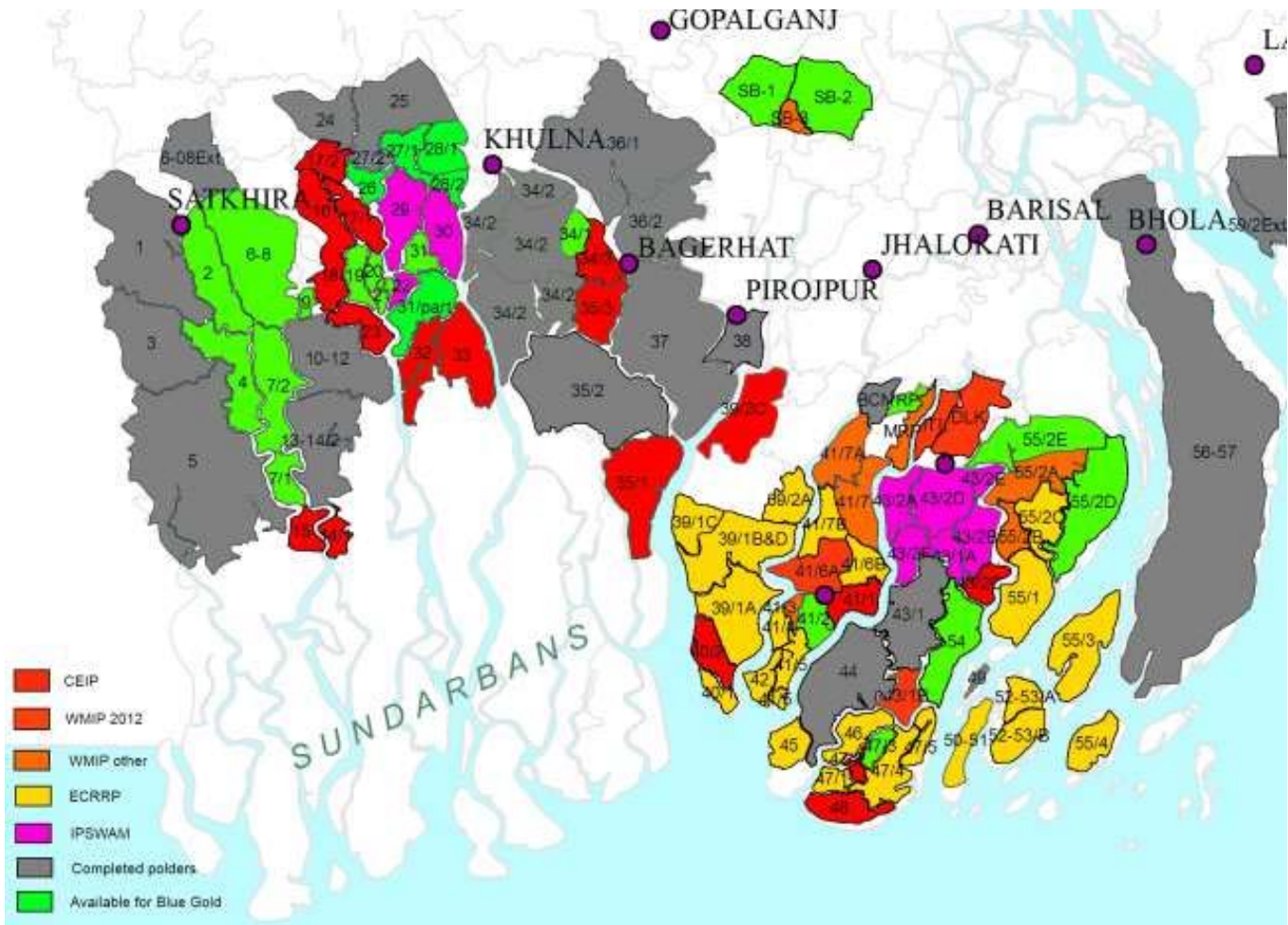
- ✚ Polders which have not been rehabilitated yet and where the communities are not organised.
- ✚ In the IPSWAM polders the scope of the already existing WMG will be broadened by including the productive sectors, this process can start immediately. After selection of the of polders to be included in the Program, the process of community mobilisation will start and within two years the first WMG will be registered while community action plans are already be started before. The to-be-rehabilitated polders require a longer lead time, starting with community mobilization, followed by water resources infrastructure and productive sector improvements and further institutional strengthening. The livelihood component can start whenever the polders are selected.

*Source: Program Document*

### **3.1 Concept of 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](http://en.wikipedia.org/wiki/Polder#Polders_and_the_Netherlands))



Map 1: Overview of the status of polders and their on-going programmes

A programmatic approach will be followed for the selection of the polders this will ensure that the total cost will be within the financial envelope of the Program. During the second review mission a decision will be taken whether the Program will introduce the participatory polder development process outside the three districts. Map 1 is produced by the Formulation mission, based upon discussions with the BWDB a list has been made (Annex 2) of the polders from which a final selection can be made which is different from the green colored polders in this Map.

### 3.2 Types 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.

### 3.3 Purpose of Polder formation

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. Instrumental in the region’s 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 bed to such levels that the polder region itself effectively lies below the water level. As a result, when sluice gates are opened, instead of water running from the polder lands, outside water rushes in, resulting in long-lasting water logging and flooding.

Many of the polders were created to increase the safety of the people living in the or near the sea and rivers. People build dikes around the sea or river to protect themselves.

“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](http://www.irinnews.org/report/98292/bangladesh-polders-under-threat). (Sources; <http://www.irinnews.org/report/98292/bangladesh-polders-under-threat> )

### 3.4. Polders situation at a glance at Bagruna

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In Barguna district there are 22 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 Barguna 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 Barguna District. 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 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.

**Table 3.2: Communication situation of Polder 43/1A**

Polder	Union	Pacca road	Herringbone road	Kancha road
43/1A	Atharogachia	20km	5km	60km
	Kukua	30km	3km	150km

The polders listed below formed during IPSWAM period at Patuakhali region. This document is mainly focus on polder **43/1A (yellow marked)**.

**Table 3.2: Polders at Patuakhali Zone**

Polder no	Upazila & District	Gross Area (ha)	Net Area (ha)	No. of WMGs	No of WMA	No. of households of local stakeholders)	Savings of WMG Members (TK)
43/2A	Sadar, Patuakhali	5,182	3,887	22	1	8,692	989,030
43/2E	Sadar, Patuakhali	1,650	1,300	12	1	2,997	140,000
43/2D	Sadar, Patuakhali	8,800	6,800	30	2	11801	544175
43/2F	Amtali, Barguna & Sadar, Patuakhali	4,453	3,500	27	1	6639	363585
43/1A	Amtali, Barguna	2,675	2,200	14	1	5,105	244,071
43/2B	Galachipa, Patuakhali; Sadar & Amtali, Barguna	5,460	4,000	28	6	10,382	495,180



## MASTER FILE OF POLDER 43/1A



*Map: Bangladesh Costal Polders*

### 4.0 Geographical Location of polder 43/1A

#### Surrounding area:

- North West: Morochbunia Union (Polder 43/2D)
- North east: Auliapur Union (Polder 43/2D)
- East: Nauli River
- East North: Amkhola Union (Polder 43/2B)
- East South: Part of Atharogachia Union
- South East: Gazipur Khal and Chawra Union
- South West: Part of Kukua Union
- West South: Kukua River and Part of Polder 43/2F
- West North: Kukua River and Gulishakhali Union (Polder 43/2F)

Polder 43/1A lies between Latitude 22° 09'52" and 22° 15'49" North and Longitude 90° 17'15" and 90° 21'13" East. The gross area of the polder is about 2675 hectares, with a net cultivable area of 2660 hectares.

It is irregularly shaped, with the North/South axis, somewhat longer than the East/West one.

Polder 43/1A starts from the place named Sakaria, 12 Km away from the Patuakhali sadar and ends point is shaheb Bari Bus Stand. Polder 43/1A is 08 Km in length through the inter district road towards Barguna.

## 4.1 Climate

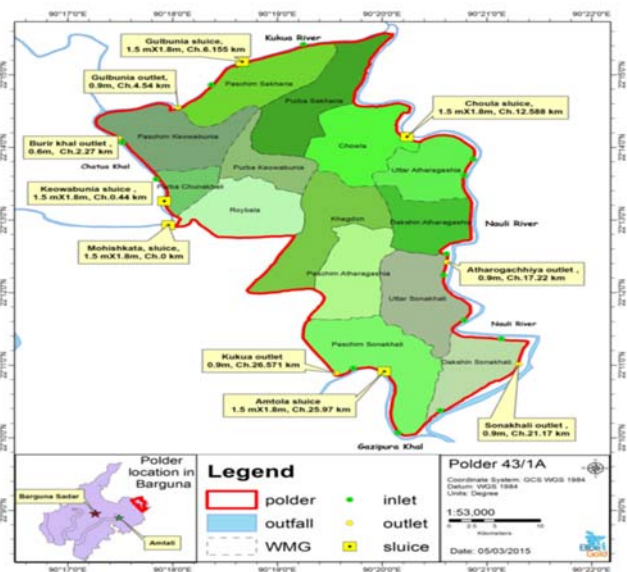
Barguna has a tropical wet and dry climate. Maximum temperature of this district is 33.3°C and appears in the month of May, minimum 12.1°C appears usually in January. Annual rainfall is 2506 mm that maximum falls in June, July, August and September. Part of sunderbans is situated under Barguna district and there is a long cost in this district. Thus Barguna faces frequently become victim of different tornado and tidal bore. Heavy rainfall in the monsoon is another threat for this area. Sometimes the rain comes very early in the season and damaged field crops of Kharif-2 like Mung Bean, Sunflower, Chili, Ground Nuts, Sweet Potato and Sesame. On the other hand, in the dry season, surface water goes down severely and farmers are facing problem with irrigation ware for their agriculture.

## 4.2. Administrative and Demographic Information

Polder 43/1A consists of 7 mouzas, of which 3 mouzas belongs to Atharogachia Union under Amtali Upazila of Barguna district, and 4 mouza belongs to Kukua Union under Amtoli Upazila of Barguna district. Total 14 numbersof villages are in this polder, among them 5 villages under Kukua Union and 9 are under Atharogachia union.



Map: Amtoli Upazila



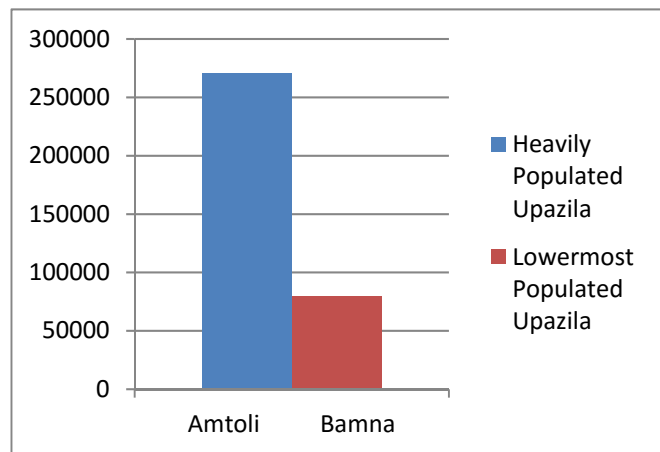
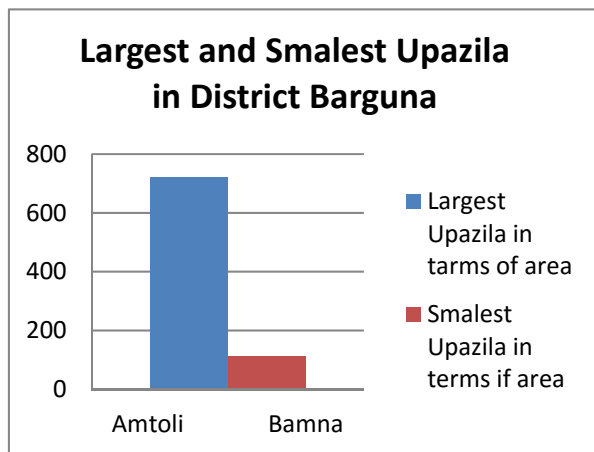
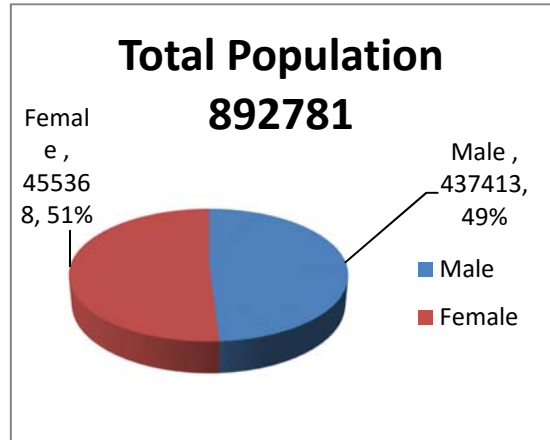
Map: Polder 43/1A

District: Barguna  
 Upazilla: Amtoli  
 Union: Atharogachia and Kukua  
 Mouza: 07 (04 under Kukua Union, 03 under Atharogachia Union, Amtoli Upazilla, Barguna District)

Village coverage: 14

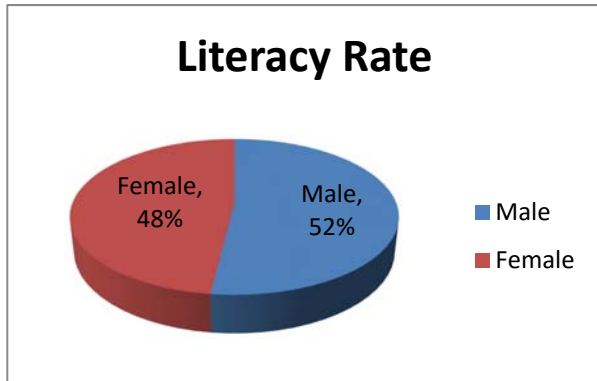
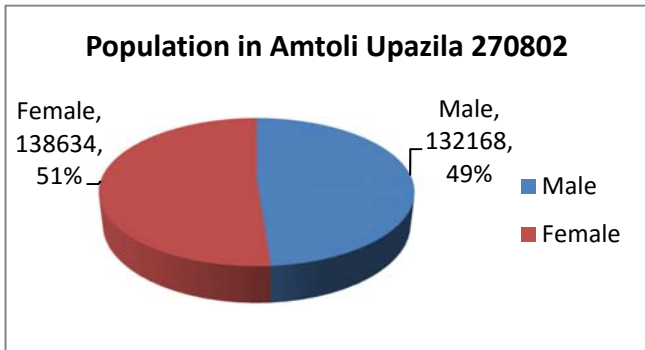
**Administrative and Demographic Statistics of District Barguna**

Polder 43/1A lies under Barguna District of Barisal Division in Bangladesh. Brguna District consist of 5 Upazilas among them Amtoli is one of the Upazila in Barguna District. Polder 43/1A is under Amtoli Upazila. It partially covered 2 Unions of the Upazila. The Unions are Atharogachis and Kukua. There are 42 Unions and 4 Paurasavas in the District. Unions are divided into 309 Mauzas. The smallest administrative unit of Bangladesh is Word but local people are familiar with the village. Total 562 villages are in the District Barguna. Population density in the District Barguna is not so high. Total population of this district only 892781 among them 437413 are male and 455368 are female and total household number is 215842. So the family size of District Barguna is 4.136. The largest Upazila of this District is Amtoli 720.76 sq. km and the smallest Upazila is Bamna 101.05 sq. km. The largest Union of this District is Haludia 113.97 sq km and the smallest Union is Kazirabad 19.87 sq. km. Amtoli is heavily populated Upazila 270802 and Bamna is lowermost populated side by side Haludia is heavily populated Union 29727 and Sharikkhali is lowermost populated Union 7804.



**4.2.1 Administrative and Demographic Statistics of Upazila Amtoli**

Amtoli Upazila is one of the Five Upazilas of District Barguna. North and east part of this Upazila is surrounded by District Patuakhali, south is Taltoli Upazila (Once Taltoli was a part of the Amtoli Upazila) and west part is surrounded by River Payra. Total area of this Upazila is 720.76 sq. km. and population is

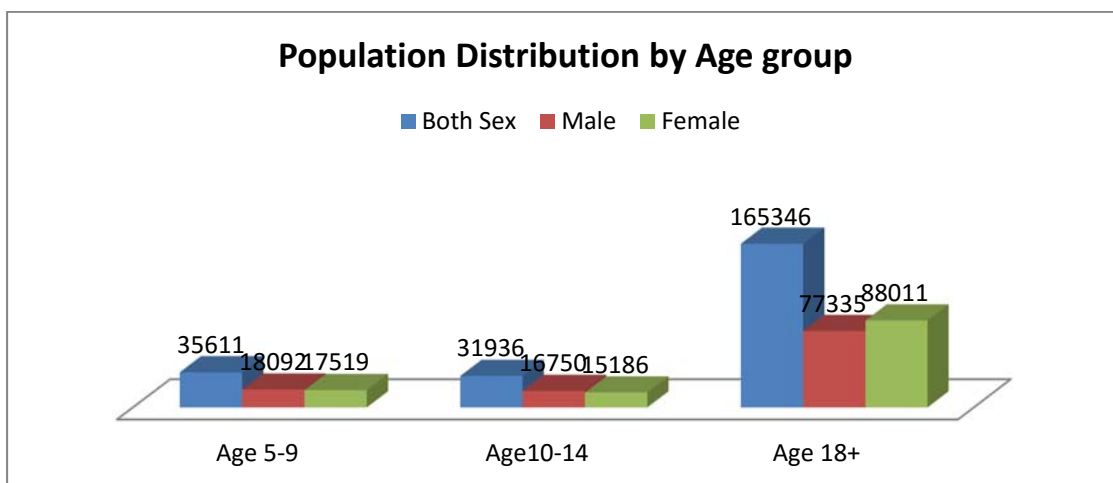


270802 among this male are 132168 and 138634 female. This Upazila is blessing of world’s largest mangrove forest “Sundorbans”. A part of forest “sundorbans” lies under this Upazila. Only the Mangrove echopark established under this Upazila (now it is under Taltoli Upazila). Upazila Amtoli divided into seven Unions (Once this Upazila constituted by 10 Unions thus 2 years

ago it has been devided into two Upazilas, one is Amtoli and another is Taltoli Upazila). Total 63212 nos. of households are permanently living in this Upazila. Overall literacy rate of people of this Upazula is 52.8. Literacy rate of male is (54.9) higher than the female (50.8).

**Table4.1: Population distribution in Upazila by selected age group**

Age Group (Years)	Both Sex	Male	Female
05-09	35611	18092	17519
10-14	31936	16750	15186
18+	165346	77335	88011

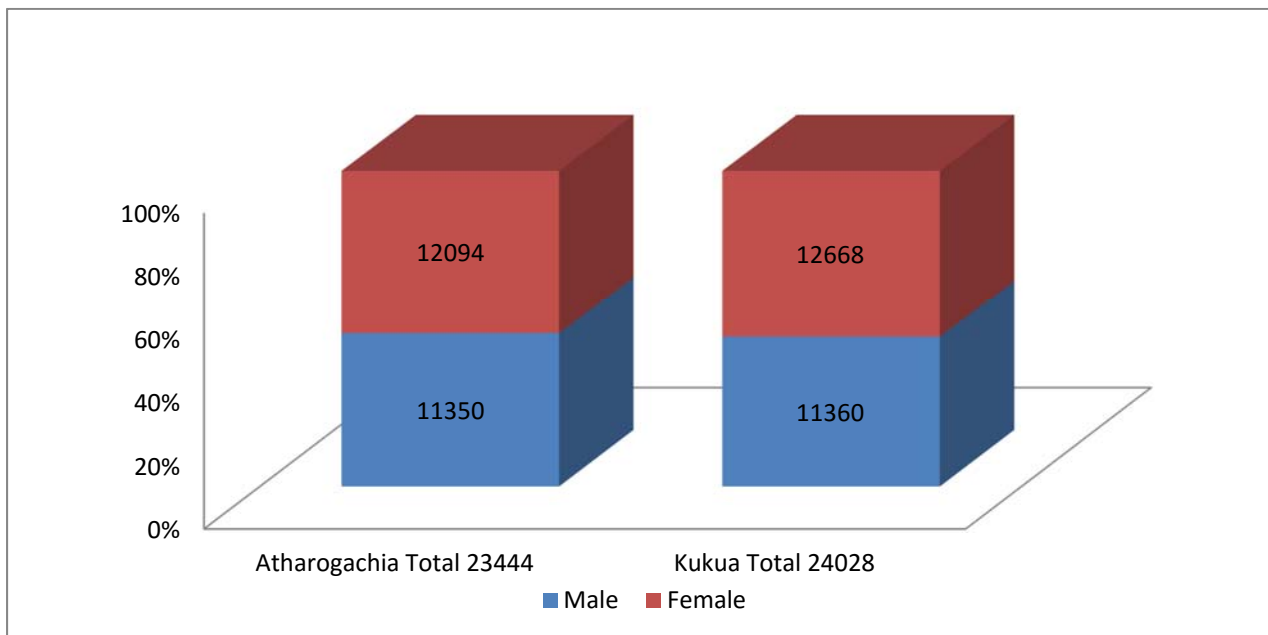


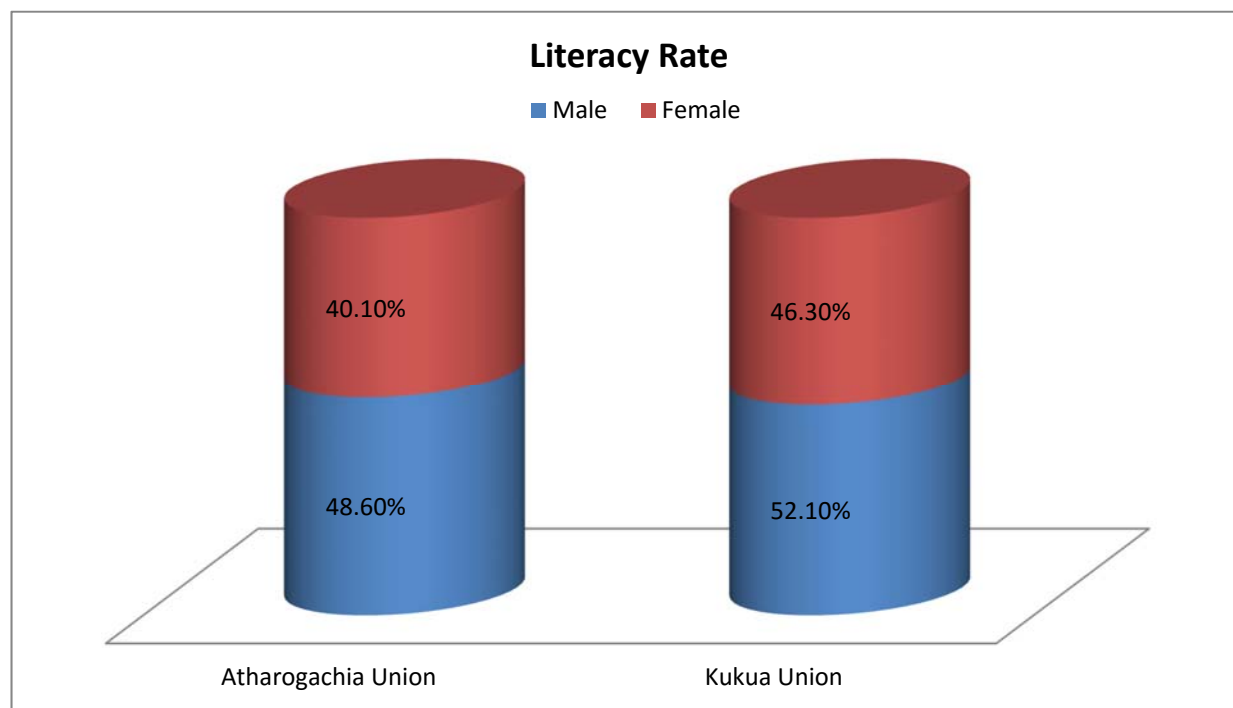
**4.2.2 Administrative and Demographic Statistics of Union Atharogachia and Kukua**

According to BBS March 2014 it seems that the area, population and households of Union Atharogachis and Kukua are almost same. The total area of Atharogachia Union is 11269 acres and Kukua Union is 11288 acres as well as population of Union Atharogachia 23444 and of Kukua is 24028. Total 5349 nos. of households are permanently living in the Union Atharogachia and 5652 nos. of household are living in Union Kukua. Literacy rate of male in both Union are higher than female.

**Table 4.2: Total HH and Population of Atharogachia and Kukua Union**

Polder	Union Name	Total HH	Population			Literacy Rate (%)		
			Total	Male	Female	Total	Male	Female
43/1A	Atharogachia	5349	23444	11350	12094	44.2	48.6	40.1
	Kukua	5652	24028	11360	12668	49.0	52.1	46.3





**Table 4.3: Populaton distribution in Upazila by selected age group**

Age Group (Year)	Atharogachia Union			Kukua Union		
	Both Sex	Male	Female	Both Sex	Male	Female
05-09	3216	1638	1578	3392	1811	1581
10-14	2876	1532	1344	2954	1546	1408
18+	13977	6425	7552	14320	6215	8105

Source: BBS 2014

### **4.2.3 Administrative and Demographic Statistics of Polder 43/1A**

**List of Mauza:**

Sl	Name of Union	Name of Mauza
1	Atharogachia	Sonakhali
2		Atharogachia
3		Sakharia
4	Kukua	Keowabunia
5		Roybala
6		Dakshin Chunakhali

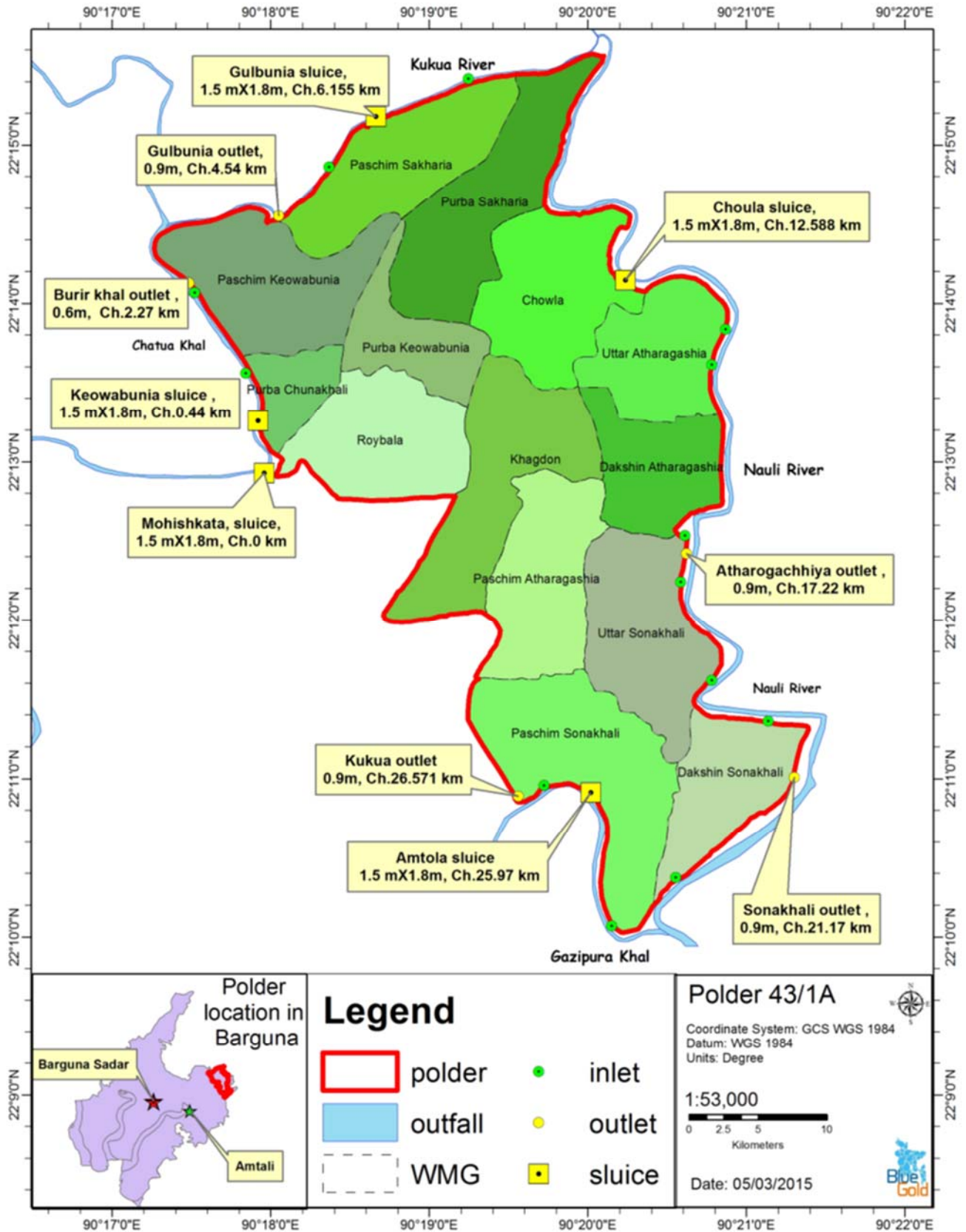
MASTER FILE OF POLDER 43/1A

7		Khagdon
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**List of Villages:**

Sl.	Name of Union	Name of Village
1	Atharogachia	Paschim Sakharia
2		Purba Sakharia
3		Chawla
4		Uttar Atharogachia
5		Dakshin Atharogachia
6		Paschim Atharogachia
7		Uttar Sonakhali
8		Dakshin Sonakhali
9		Paschim Sonakhali
10	Kukua	Paschim Keowabunia
11		Purba Keowabunia
12		Purba Chunakhali
13		Roybala
14		Khakdon

MASTER FILE OF POLDER 43/1A





**Map of Polder 43/1A**

Before constructing polder the area was cross-crossed with meandering tidal creeks, many of which still exist, although no longer open to tidal movement. The whole polder is almost flat. There are only a few depressions, and their depth is normally less than 0.30 meter. However, small differences can be important, especially when higher land in the form of levees occurs close to sluices or outlets.

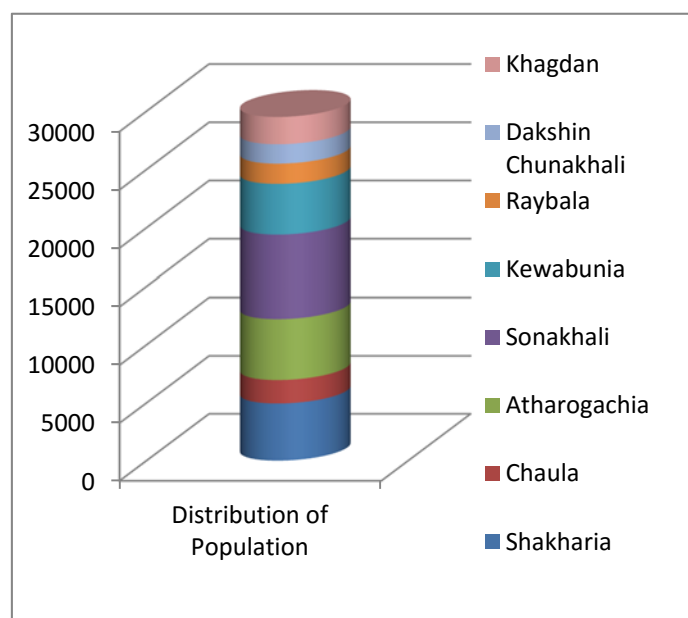
Total number of HH under this polder is 5425. Village wise HH distribution in this polder has been shown in the table below: From the table it is showing that maximum HHs located at Sonakhali village under Amtoli upazila which is 1220 and lowest at Dakshin Chunakhali village which is 320. The average HH number per village is 678 at Polder 43/1A.

**Table 4.4: Mauza wise HHs distribution of Polder 43/1A**

Name of village	Union & Upazila	District	No. of HH
Shakharia	Atharogachia Union, Amtoli Upazila	Barguna	1292
Atharogachia	Do	Do	1004
Sonakhali	Do	Do	1220
Kewabunia	Kukua Union, Amtoli Upazila	Do	821
Raybala	Do	Do	322
Dakshin Chunakhali	Do	Do	320
Khagdon	Do	Do	446
<b>Total (08 villages)</b>			<b>5425</b>

*Source: Component-1; Blue Gold Program, 2015.*

**Table 4.5: Distribution of population in the Polder 43/1A**



*Source: Component 1 Blue Gold Patuakhali 2015.*

Name of village	Union	Total
Shakharia	Atharogachia	4952
Chaula	Atharogachia	2031
Atharogachia	Atharogachia	5221
Sonakhali	Atharogachia	7212
Kewabunia	Kukua	4351
Raybala	Kukua	1738
Dakshin Chunakhali	Kukua	1664
Khagdan	Kukua	2341
Total		29510

### 4.3 Overview of Polder 43/1A

- According to C-1 HH survey the percentage of women-headed households in 43/1A is only 3%.
- 64% population is within the age range between 20 to 49 years and 20% up to 59%. It indicates that a huge number of work forces are there in the polder.
- In this polder 37% HH is involve with NGOs. This involvement is mainly due to micro-credit. It clearly indicates that the

people of this polder are more vulnerable and economically they are back-footed.

- Present population of this polders is about 29510 (27654 male 13920 Female 13734 according to UP). People have been migrated and the possible causes are-
  - Less opportunity of income,
  - Hardship, vulnerable to disaster,
  - Minimum or less services,
  - Bad communication etc.
- Average HH size is only 4.45 which is impressive.
- Main source of income for 70% is agriculture where 20% is labour and 7% is business. They are mainly involved in agricultural business, like- seasonal business, fish, betel leaf etc. But the business trend is much lower than the polders of Khulna (20% involve in business).

*Source: Focus Group Discussion (FGD)*

### 4.4 Local Government Institute

Union parishad is the oldest and lowest local govt system. It constitutes with a concentrated geographic area demarcated by the Government. It has been functioning for more than hundred years for the rural development of the country. At preset Bangladesh has 4480 Union parishad, Union parishads are run by the directly elected representatives. There are 13 elected representatives are representing the people of a Union. The representatives are 1 Chairman, 9 elected Members and 3 Women Members. Local Government Department is the controlling authority of the UP. To elect the representatives LGED arrange a UP election every five year interval and the permanent resident of the Union is eligible to be a candidate of the election.

The government recruits a secretary in each UP for administrative activities of the Union. Actually he/she is the representative of the People Republic of Bangladesh. A nice UP building is the center of the all activities of the Union. All the elected representatives and official members are sitting in the UP building.

Structure of Union Parishad:

1. Chairman: There shall be a chairman of Union Parishad directly elected by the voters of the Union.
  2. Members: Nine members shall be directly elected from the nine wards constituting the Union.
  3. Women members: Three seats shall be reserved for women. Each of the women members shall be directly elected by the male and female voters of three wards within a Union.
  4. UP Secretary: The government representative, responsible for all the administrative activities and assisting the elected representative.
- Official members: The Block Supervisor (Directorate of Agriculture), Health Assistant, Family Planning Assistant, Family Welfare Worker, Ansar/VDP and all other field staff of government departments working at Union level will be the official members of Union Parishad. They will have no voting right.

**Table 4.6: List of elected UP representatives and Secretary of Polder 43/1A**

Union & Upazila	Name	Designation	Ward no.	Word under Polder 43/1A	Mobile no.
Unoin: Atharogachia	Md.Harun-ur-Rashid	UP Chairman	-		01712879257
	Md.Abdul Aziz	UP Secretary	-		01718155334
Upazila: Amtoli	Md.Mahabub Alam	UP Member	1	1	01716554652
	Md.Ab.Jani Gazi	UP Member	2	2	01757814564
District: Barguna	Md.Ab.Barek Sikder	UP Member	3	3	01764683260
	Md.Moslem Gazi	UP Member	4		01735686315
	Md.Sobhan	UP Member	5		01725766285
	Md.Sohag Talukder	UP Member	6	6	01716165953
	Md.Kashem Hawlader	UP Member	7	7	01758956994
	Md.Shahidul Islam	UP Member	8	8	01724023723
	Md.Mosarrat Hassain	UP Member	9		01735540059
	Miss.Farida Yasmin	Woman Member	1,2&3		01724404283
	Md.Kohinur Begum	Woman Member	4,5&6		01714907212
	Miss.Rani Begum	Woman Member	7,8&9		01729042904
Unoin: Kukua	Md.Kayesur Rahman	UP Chairman	-		01712879257
	Sumonta Chandra Das	UP Secretary	-		01726680891
Upazila: Amtoli	Md.Sultan Hawlader	UP Member	1	1	01753196986
	Md.Dulal Madbar	UP Member	2	2	01728024894
District: Barguna	Md.Ab.Mannan Montu	UP Member	3	3	01716050508
	Md.Dulal Talukder	UP Member	4	4	01752092151
	Md.Manjur Rahman	UP Member	5		01713654287
	Md.Abul Kalam	UP Member	6		01718081386

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	Ma.Abdur Razzak	UP Member	7		01757818798
	Shibu Chandra Sheel	UP Member	8		01714575829
	Md.Neyamat Ullah	UP Member	9		01714575829
	Miss.Monowara Beg.	Woman Member	1,2&3		01772313024
	Miss.Momtz Begum	Woman Member	4,5&6		01722542850
	Konak Bala Biswas	Woman Member	7,8&9		01712747229

## 5.0 Institutional Resources in Polder 43/1A

There are a number of institutes functioning in the polder 43/1A. Most of the institutions have been established with the support of development projects like WMGs have been established by the support of IPSWAM/Blue Gold, CBOs have been established with the assistance of RFLDC-B and IPM/ICM clubs has established in the support of AEC. The main objective to establish the institutions/organizations is to capacity building of the organizations so that they can run their development activities smoothly even after withdraw the project support.

### 5.0.1 Community Organizations in the polder 43/1A

**Table 5.1: List of WMG with meeting place & date, distance from Uz HQ and members in WMG**

Name of Union	Name of WMG	Name of Village	Meeting Place	Meeting Date	Distance from Upazila HQ (Km)	Potential WMG Members
Kukuya	Raibala	Raibala	Eidgha Mat – Raibala	06/00/2014	16	141
Do	Khagdon	Khagdon	Hazar Takar Bed	30/00/2014	18	300
Do	Purba Keowabunia	Purba Keowabunia	Keowabunia Ak. Madrasha	12/00/2014	16	221
Kukuya	Paschim Kawabunia	Purba Keowabunia	Pas.Kawabunia Pri. School	15/00/2014	18	301
Do	Purba Chunakhali	Purba Chunakhali	WMG Savapotir Bari	09/00/2014	14	126
Atharagashia	Paschim Atharagashia Darikata	Atharagashia	Pas.Athargachia Pri. School	13/00/2014	22	204
Do	Uttar Atharagashia	Do	Chowla WMA Office	16/00/2014	27	190

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Do	Dakshin Atharogachia	Atharagashia	Athargachia High School	25/00/2014	25	200
Do	Purba Sakharia	Sakharia	Brick field – Sakharia	10/00/2014	22	280
Do	Paschim Sakharia	Sakharia	Sakharia High – School	01/00/2014	25	260
Do	Dakshin Sonakhali	Sonakhali	WMG Savapotir Bari	17/00/2014	30	158
Do	Paschim Sonakhali	Do	Surat Chanra Bappery Bari	1st Wed. day	23	309
Do	Uttar Sonakhali Gudanga	Do	Sonakhali Collage	18/00/2014	28	267
Atharagashia	Chowla	Chowla	Chowla WMA Office	23/002014	28	256

Source: Component-1, Blue Gold Program, Patuakhali

**5.0.2 WMGs' Representatives and thire detailed in WMA in Polder 43/1A**

Name of WMA	Sluice Gates under WMA	Name of WMG's	WMA Representative			
			Name	Father's/Husband's Name	Position in WMG	Mobile No.
1	2	3	4	5	6	7
1. Amtala-Chowla Sluice Water Management Association (WMA)	Chowla Sluice	1. Uttar Atharogachia	Nazmunnahar Mukul	Akhtar Uzzaman Khan	Chairman	01713962862
			Md. Halim Hawlader	Apter Uddin Hawlader	Gen. Secretary	01712615518
			Md. Milon Talukder	Lal Mia Talukder	Joint- Secretary	01791078961
			Md .Dulal Talukdar	Taher Ali Talukder	Cashier	01777804559
		2. Dakshin Atharogachia	Md. Badrul Hasan Baker	Late Belayet Hoss. Khan	Chairman	01713966859
			Md. Soleman Hawlader	Ali Akbar Hawlader	Vice- Chairman	-----
			Md. Moksedur Rahman	Sherajul Haque Hawlader	Gen. Secretary	-----
			Mst. Nargis Begum	Mosharrof Dali	EC Member (G)	01722439561
		3. Chowla	Md .Sanu Matbor	Late Kalu Matbor	Chairman	01718272864
	Md. Abdul Aziz Hawlader		Moyej Uddin Hawlader	Vice- Chairman	01772313024	
	Mst. Moyna Begum		Khalil Matbor	Joint- Secretary	-----	
	Golam Sorowar Khan		Late Belayet Hoss. Khan	EC Member (G)	01726477142	
	Amtola Sluice	4. Uttar Sonakhali	Md. Abu Bakar Mamun	Joynal Shikder	Chairman	01716504758
			Kanak Bala Biswas	Monu Biswas	Vice- Chairman	01712747229
		Md. Khabir Hossain	Fazlul Haque Hawlader	Joint- Secretary	01739080804	
		Md. Alauddin Khan	Late- Seraj Khan	EC Member (G)	-----	
		5. Dakshin	Md. Muzaffor Pada	Bolu Pada	Chairman	01719937564
Md. Nizam Uddin	Fazlul Haque Dorzi		Gen. Secretary	01713963585		

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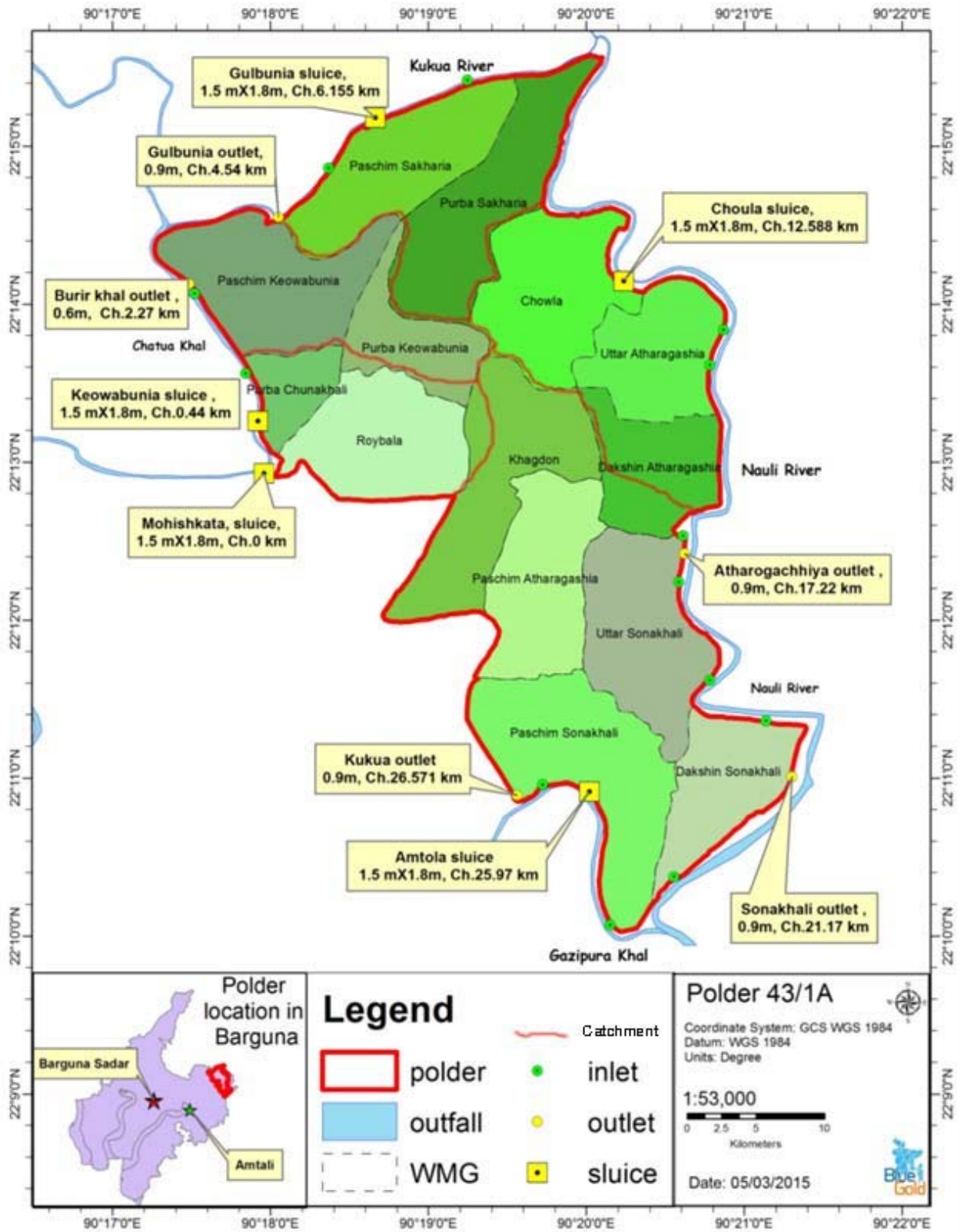
		Sonakhali	Md. Shahin Hawlader	Md.Moti Hawlader	Cashier	01733190627		
			Mst. Khaleda Begum	Mannan Mridha	EC Member (G)	-----		
		6. Paschim Atharogachia			Md . Shah Alam Sikder	Abdul Majid Sikder	Gen. Secretary	01725174081
					Rina Begum	Md. Sirazul Haque Mollah	Joint- Secretary	01784554953
					Jahangir Mollah	Md. Isahak Mollah	EC Member (G)	01713953126
					Md. Masud Alam Molla	Md. Idris Molla	Gen. Member	01778898626
		7. Paschim Sonakhali			Md. Yousuf Akon	Abdul Rashid Akon	Chairman	01713962160
					Md. Moinuddin	Abdul Barek Akon	Gen. Secretary	01735727260
					Md. Monir Akon	Abdur Rashid Akon	EC Member (G)	01725694082
					Dipika Rani	Palas Kumar Bepari	EC Member (G)	-----
		8. Khakdan			Md. Emdad Chowkider	Atiur Rahman	Chairman	01729322476
					Abdus Sobahan Mridha	Abul Hashem Mridha	Gen. Secretary	01743254270
					Masum Mridha	Abdul Haque Mridha	EC Member (G)	01723556209
					Alo Begum	Abu Sayed	EC Member (G)	
		2. Kewabunia- Mahiskata-Golbunia Sluice Water Management Association	Kewabunia Sluice	1. Purba Kewabunia	Md. Keramat Hawlader	Late Foizur Ali Hawlader	Chairman	-----
					Md. Delowar Hawlader	Late Meser Ali Hawlader	Gen. Secretary	01721689625
Mst. Mukul Akter	Md. Shohagh Pada				Joint Secretary	-----		
Md. Jabbar Pada	Late Ali Akbar Pada				Cashier	-----		
2. Paschim Kewabunia					Md. Faruk Hossain	Montaz Uddin Hawlader	Chairman	01726453201
					Md. Jahirul Islam	Md. Muzibar Matbar	Gen. Secretary	01716360560
					Md. Kalam Sardar	Md. Jabbar Sardar	EC Member	-----
					Mst. Salma Begum	Md. Khokon Mridha	EC Member	-----
Mahiskata Sluice	3. Purba Chunakhali			Md. Ismail Akon	Abdul Aziz Akon	Chairman	01713869327	
				Abdul Barek Miah	Ayen Uddin Mollah	Vice- Chairman	-----	
				Md. Habibur Rahman	Nur Hossain Mridha	Cashier	01782604828	
	4. Raibala				Mst. Nasima Begum	Jalil Hawlader	EC Member (G)	-----
					Md. Moniruzzaman Gazi	Nur Mohammad Gazi	Gen. Secretary	01732374793
					Mst. Nasrin Alam	Johirul Islam	Cashier	01770359780
					Nur Hossain Hawlader	Abdul Haque Hawlader	EC Member (G)	-----
					Md. Anjamal Akon	Fazlul Karim Akon	Member	01745007012
Golbunia Sluice	5. Purba Shakharia			Md. Nasir Uddin	Abdul Sattar Hawlader	Chairman	01716994656	
				Md. Nizam Hawlader	Abdur Rashid Hawlader	Gen. Secretary	01735539641	
				Md. Jalal Hawlader	Late Ramjan Hawlader	EC Member (G)	01712168834	
				Hosne Ara Begum	Sultan Hawlader	EC Member (G)	-----	
	6. Paschim Shakharia				Md. Nijmul Haque Tipu	Md. Fazlul Haque	Gen. Secretary	01756125410
					Mst. Piyara Begam	Md. Jabbar Pada	Joint Secretary	-----
					Abdul Mannan Hawlader	Abul Hossain Hawlader	EC Member (G)	01714351124
					Md. Abdul Quddus	Abdul Malek Bepari	EC Member (G)	-----

## 5.1 Catchment, WMO and Water Resource Management

Catchment is a concentrated area constitute with some villages surrounding to a sluice gate. The villages under each catchment are being getting benefit in irrigation and drainage by using the sluice gate. Blue Gold Program has divided a polder into a number of Catchments and they have formed some WMGs under each Catchment and all the WMGs under a Catchment form a WMA. Main responsibility of WMA is to maintain and managing the sluice gate and water resources. The prime occupation of the polder dwellers is agriculture and they require irrigation for their agriculture. So, the WMA/WMG has a big responsibility to available the irrigation water as well

as drain out the excess water. It can be possible by proper maintenance and management of sluice gate and natural water.

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Polder Map indicating demarcation of Catchment area





On the other hand, in the rainy season farmers need to drain out the excess water by using the sluice gate. So all the farmers in a catchment area can participate the decision making and implementation of the water management activities and they can utilize the natural water for their agriculture, Fish farming, Ducks and Buffalo rearing. Side by side they can save their resources from the high tied and water logging. The general phenomenon of the catchment, flow the water upstream and downstream to the sluice gate. Areas adjacent to the canals are high land then distance areas. It is because most of the canals are tidal and usually the closest areas of canals tend to be silted out. If we consider the cropping pattern of the catchment area, it is seems that the farmers are cultivating winter vegetables, summer vegetables and some drought tolerant field crops (Chili, Sweet Potato, Groundnut) at the closest areas of the canals since land of this areas are comparatively higher than other areas of the catchment.

**5.1.1: Water Management Groups (WMGs) under catchments and Water Management Associations (WMAs) in polder 43/1A**

Name of WMA	Name of Sluice/Catchment	WMG under Catchment	Remarks
<b>Amtala-Chowla Sluice Water Management Association (WMA)</b>	Chawla Sluice/Catchment	Uttar Atharogachia	Catchment – 1
		Dakshia Atharogachia	
		Chawla	
	Amtola Sluice/Catchment	Uttar Sonakhali	Catchment – 2
		Dakshin Sonakhali	
Paschim Atharogachia			
Paschim Sonakhali			
<b>Kewabunia-Mahiskata-Golbunia Sluice Water Management Association</b>	Kewabunia Sluice	Purba Kewabunia	Catchment – 3
		Paschim Kewabunia	
	Mahiskata Sluice	Purba Chunakhali	Catchment – 4
		Raibala	
	Golbunia Sluice	Purba Shakharia	Catchment – 5
		Paschim Shakharia	

## 5.2 List of Community Organizers and their WMGs

Sl. #	Name of Community Organizer	Name of Union	Name of WMG
1.	 Md. Alamin 01728310324	Kukuya	Raibala
			Khagdon
			Purba Chunakhali
		Atharogachia	Paschim Atharagashia Darikata
			Dakshin Sonakhali
			Paschim Sonakhali
Uttar Sonakhali Gudanga			
2.	 Seuly Akter 01787006237	Kukuya	Purba Keowabunia
			Paschim Kawabunia
		Atharagashia	Uttar Atharagashia
			Dakshin Angulkata
			Purba Sakharia
			Paschim Sakharia
Chowla			

## 5.3 Farmer Field School in the polder 43/1A

Component -3 of Blue Gold Program is being implementing FFS activities in the Blue Gold working areas to support farmers in improved and sustainable agricultural productivity and to improve decision making capacity of the farmers. Component 3 already established 14 nos. of FFS in 14 polders. Mean that they established at list one FFS in each of 14 WMGs. From the Blue Gold side, there are 4 FFS Organizers (FO) are being facilitate the FFS activities.

**Table5.2: List of FFS at Polder 43/1A**

SI #	Name of FFS	WMG	Name of FO	Mobile no. of FO
01	Khagdon FFS	Khagdon	Aklima	01749-144486
02	Purba Chunakhali FFS	Purba Chunakhali		
03	Purba Kewabunia FFS	Purba Kewabunia		
04	Roybala FFS	Roybala		
05	Dakshin Atharagashia FFS	Dakshin Atharagashia	Yousuf Ali	01754-269920
06	Dakshin Sonakhali FFS	Dakshin Sonakhali		
07	Uttar Atharagashia FFS	Uttar Atharagashia		
08	Uttar Sonakhali FFS	Uttar Sonakhali		
09	Paschim Atharagashia	Paschim Atharagashia	Abul Basar	01724-430164
10	Paschim Sonakhali	Paschim Sonakhali		
11	Chowla	Chowla	S. Nahar	01729-686149
12	Paschim Keowabunia	Paschim Keowabunia		
13	Paschim Sakharia	Paschim Sakharia		
14	Purba Sakharia	Purba Sakharia		

#### 5.4 Community Organizations beyond the Blue Gold support

There are some other community organizations in the polder 43/1A. The organizations have established with the support of Regional Fisheries & Livestock Development Component (RFLDC). The main objectives of these organizations are to support resource poor farmers in improved productivity through extensive fisheries and livestock services. There are three nos. of Community Based Organizations are being supporting farmers in the polder 43/1A. There are some other organizations, named IPM/ICM club in the polder 43/1A established by DAE/AEC and main objective of the organizations is sustainable agricultural productivity. Six IPM/ICM Clubs have established in the polder 43/1A.

**Table 5.3: List of Community Organizations beyond the Blue Gold support**

Sl.	Name of Organization	Location	Support by
01	Kukua Community Based Organization	Azimpur Bazer	Regional Fisheries and Livestock Development Component (RFLDC)
02	Atharogachia Community Based Organization	Brick Field Bazer	Regional Fisheries and Livestock Development Component (RFLDC)
03	Chawla Womens' Community Based Organization	Chawla Bazer	Regional Fisheries and Livestock Development Component (RFLDC)

**Table 5.4: List of IPM/ICM Clubs**

Sl.#	Name of Club	Place of Club	Name of Chairman	Remarks
01	Golbunia ICM Club	Golbunia	Md. Sultan Hawlader	IFMC Pilot
02	Purba Sakharia ICM Club	Purba Sakharia	Sultan Fakir	
03	Atharogachia ICM Club	Atharogachia	Alauddin Al Azad	
04	Dharmanarayan ICM Club	Dharmanarayan	Moslem Ali Farkir	
05	Baintala ICM Club	Purba Sakharia	Chan Mia Pyada	
06	Dharmanarayan IPM Club	Dharmanarayan	Nasir Uddin	

**Table 5.5: List of Sub Assistant Agriculture Officer (SAAO)**

Union/Upazila	Name of SAAO	Block responsible for	Mobile No.
Kukua	Perveen Akter	Kewabunia	01718850312
	Belal Hossain	Chunakhali	01812030733
	Amullya Chandra Mandal (Additional Responsibility)	Kukua	01718452247
Atharogachia	Harolal Chandra Mistri	Shakharia	01834822104
	Amullya Chandra Mandal	Atharogachia	01718452247
	Humayun Kabir	Gazipur	01716472928

## 5.5 Public/Private Institutes and infrastructures

### 5.5.1 Institutional information

Type of Institute	Name of Institute	Activities of instituts
Public Institute	DAE, DoF, DLS, DoC, BWDB, LGED	Technilogy and service delivery
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	Product promotion, distribution and sale
Research institute	Regional Horticultural Research Institute-BARI, Patuakhali, Science and Technological University (PSTU)	On-farm research and technology development/improvement

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Private entrepreneurs (Beyond the polder)	M/S. Chanchal Hatchery, Bay of Bengal Hatchery	Produce and distribute inputs (Fingerling/fry)
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### 5.5.2 List of Educational institutes and Social Infrastructures

Polder	Union	Infrastructures		Remarks
		Name	Number	
43/1A	Atharogachia	Primary School	17	Govt.
		Secondary School	5	Private
		College	0	
		Madrasha	7	
		Cyclone shelter	4	
		Post Office	4	Govt.
		Brick Field	3	Tax payer 2
		Mosque	62	Private
		Temple	7	
		Orphanage	2	Private
		Police Furry (Substation)	1	
		Tub well	294	
		Haat Bazer (Village Market)	6	
		Community Clinic	4	
43/1A	Kukua	<b>Name</b>	57	
		Primary School	12	
		Secondary/Junior	6	Junior-2
		College	0	
		Madrasha	5	
		Cyclone shelter	0	
		Post Office	3	
		Brick Field	1	
		Mosque	50	
		Temple	2	
		Orphanage	0	
		Police Furry (Substation)	1	
		Tub well	300	
		Haat Bazer (Village Market)	4	
Community Clinic	3			

### 5.5.3 Cyclone Shelters in polder 43/1A

District Barguna has high cyclone vulnerability and the polder 43/1A is not safe to risk of cyclone. So to protect people from risk of cyclone the Government of Bangladesh and some other donors have constructed a number of cyclone shelters in the costal belt of Bangladesh including polder 43/1A. A list of cyclone shelter is as follows.

Sl #	Name of Cyclone Shelter	Location/Village	Union
01	Mahbub's house	Sonakhali	Atharogachia
02	Sonakhali Collage	Sonakhali	
03	Kathaltola	Atharogachia	
04	Atharogachia Junior High School	Atharogachia	
05	Baker Khan's House Primary School	Atharogachia	
06	Shakharia High School	Shakharia	
07	Paschim Sonakhali Govt. Primary School	Sonakhali	
08	Paschim Kewabunia	Kewabunia	Kukua
09	Paschim Kewabunia	Kewabunia	
10	Kukua High School	Kukua	
11	Azimpur Bazar	Kukua	
12	Dakshin Kewabunia	Kewabunia	

## 5.6 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.

**Table5.6: List of formal NGO working in Polder 43/1A**

SL	Name of Organization	Major Activity
1.	World Fish	Aquaculture for Income and Nutrition(AIN) Project is being working for improved Income and Nutrition
2.	BRAC	Agriculture development and micro credit
3.	Dhaka Ahasania mission	Disaster and Livelihood
4.	Save the Children (Nobo Jibon)	For improving of mother and child nutrition (Phased out very recent)

5.	Khalifa Foundation	Micro Credit and Livelihood Program
6.	iDE-PROOFS	Livelihood and Market development
7.	Susilon, Max Foundation	working for water and sanitation
8.	Grameen Sakti, Karania, RDF	Solar Energy
9.	Islamic Relief Foundation	Disaster and livelihood
10.	Uddipon	Livelihood program
11.	ASA	Micro Credit
12.	Grameen Bank	Micro Credit
13.	Codec	Micro Credit and Livelihood program
14.	Nazrul Smrity Sangsad	Micro credit and Livelihood Projects
15.	Nabo Jibon	Livelihood Project
16.	Natun Jibon	Livelihood Project
17.	Padakhep	Micro credit
18.	Muslim Aid	Micro credit and Loan for SME
19.	HEED Bangladesh	Micro credit and Livelihood Program
20.	NEED Bangladesh	Micro credit and Livelihood Program
21.	BDS	Micro credit

## 5.7 Financial Services in the polder

About 50-60% HHs are involved with borrowing money from Bangladesh Krishi Bank and different micro finance institutions like: Grameen Bank, BRAC, ASA, Padakhep, CODEC, Uddipon 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 Baparries, Arothders, whole sellers, processors or millers. Sometime borrower has to pay no 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.

## 5.8 Mobile Coverage (Communication Network Opportunities)

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

- Grameen phone
- Banglalink
- Teletalk
- Airtel

- Robi
- Citycell

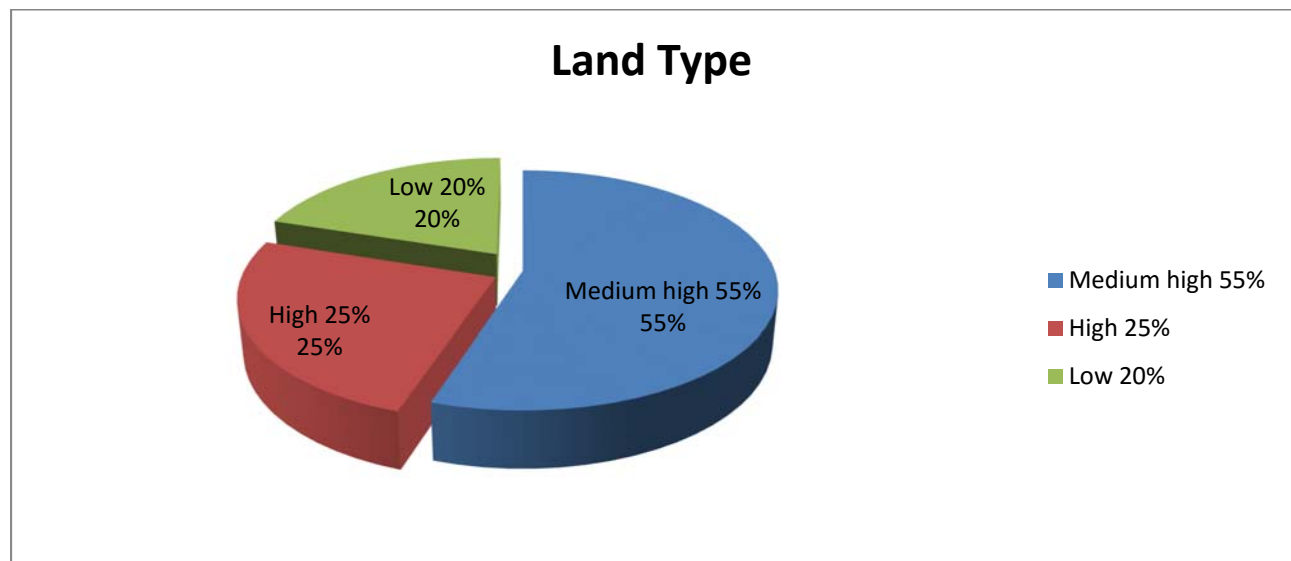
Among all the operators Grameen phone, Banglalink and Robi network coverage is fair in Polder 43/1A. Around 80-90% HHs use mobile for call through incoming and outgoing. At HHs level internet operation through mobile is an unknown feature. Maximum mobile operators are providing agriculture information (Mainly focused on production) through mobile taking a charge which could be a good source of information and market information by facilitating them to make understand how to use. However the farmers are not getting this opportunity as they don't aware properly about this or they are not motivated to get this offer.

## 6.0 Natural Resources

A plenty of natural resources are available in the Polder 43/1A. In this section describe only agricultural production related resources.

### 6.1 Land Type and crop

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 up to 90 cm.



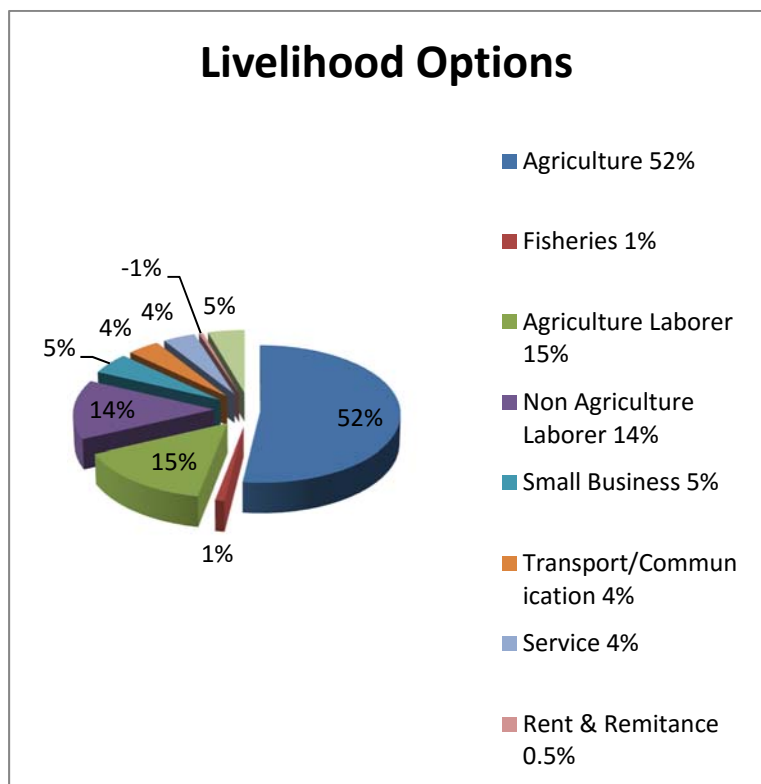


## 6.2 Soil type and crop

This is a flat land full of rivers and estuarine creeks, having regular low and high tidal. This Polder is under Ganges Tidal floodplain Agro Ecological Zone (AEZ-13). 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. Silt soils are predominating but there are significant amount of silt 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 of this area contains medium organic matter. Soil salinity range from very slightly to moderately saline ((2-4 ds/m)and partly strongly saline in dry season.

## 6.3 Livelihoods Options of the polder

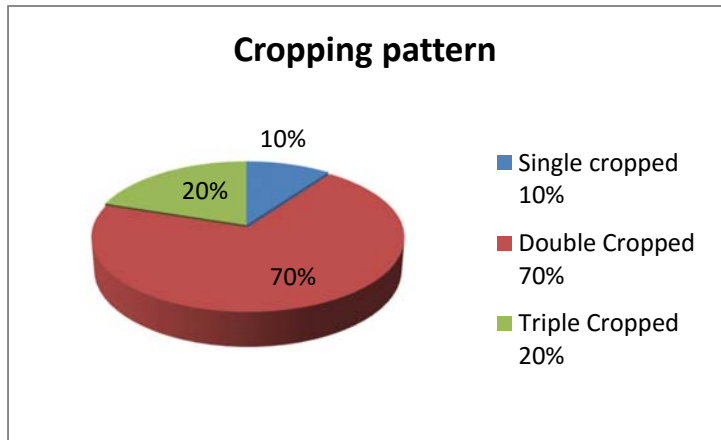
Livelihoods options of the people largely depend on the resources available at the locality and household level in terms of ownership and access. Land is being considered as a major determining factor of the socio-economic condition of rural households, though there are some other factors that also contribute 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.



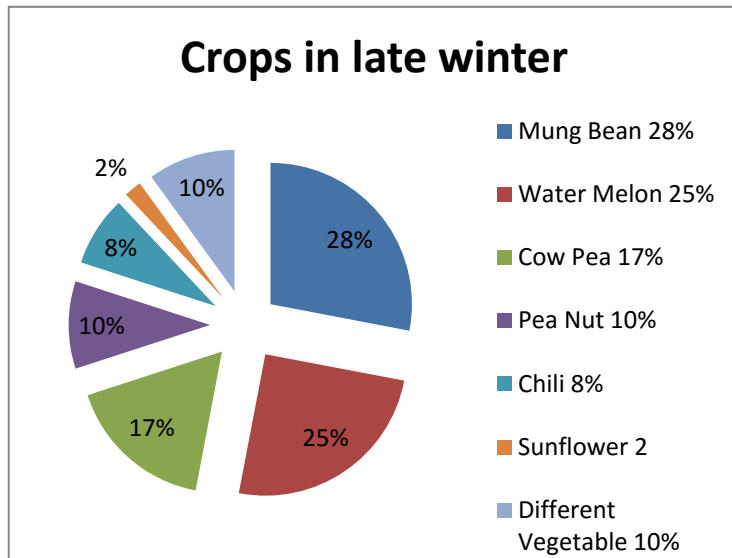
The main livelihoods sources of the polder are about Agriculture 52.00%, fisheries 1%, non-agricultural laborer 14%, agricultural laborer 15%, commerce/business (including small business) 5%, transport and communication 4%, service 4%, rent and remittance 0.5% and others 4.5% of the people.

## 6.4 Agriculture

The total cultivated land is 2200 ha where single cropped area is 10%, double cropped area 70% and triple cropped area 20% and the cropping intensity is 213%. The major cultivated crops in the polder 43/1A at Karif-1 are T-Aush rice-50%, Sesame-2% and rest 58% 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-57% of cultural land (Mungbean-28% of land, Kheshari-17% of land, Sunflower-2% and peanut-10% of land), Water Melon – 25%, Vegetables (Red amaranth, Radish, Cauliflower, Cabbage, Spinach, Broccoli, Sweet potato etc.)-5% of land, and spices (Chili)-8% of land and 10% land remain fallow.



In summer farmers in the polder 43/1A are cultivating different types of vegetables in small scale. There is a few numbers of farmers cultivating summers vegetables commercially but there are many farmers are selling surplus produces at the farm or bring to sale to nearby markets. There is no any commercial farmer cultivating specific vegetable in large scale. Almost all the farmers



cultivating different types of vegetables that are Pumpkin, Bitter gourd, Ash gourd, Ridge gourd, cucumber, and Snake gourd, Yeard Ling Bean, Bottle gourd, and country bean, are grown as dyke crops. The homestead are predominantly by forest plant including vegetables like-Danta (Amanath), Okra, Cucumber, Ridge gourd, Red amaranth, Indian Spinach, Cabbage, Broccoli, Radish, Tomato and Country bean etc.

In polder 43/1A the most promising crops are mungbean, groundnut/peanut and chili. Kakrol and pointed gourd (Patal) not cultivated as new crop sunflower is may be the emerging crop to this polder as some farmers is being cultivating Sunflower since last few years and farmers are hapy on this.

### 6.4.1 Cropping Pattern/Systems

The land of this polder is dominated by agricultural crop cultivation, which cultivated mainly under rain fed condition. The agricultural practices are mainly depending on favorable natural environment. The present cropping intensity is 213% and the major cropping patterns/systems are as below:

- i. Kheshari-Fallow-T-Amon
- ii. T-Aman Rice — Mungbean/ground nut — Fallow
- iii. Mung Bean-T-Aus-T-Amon
- iv. Ground nut-T-Amon
- v. Boro/Fallow-T-Amon
- vi. T-Aman Rice — Pulse/Oilseeds/Chili — Aush Rice
- vii. Betel leaf/Banana (Year round)
- vii. Vegetable-Vegetable

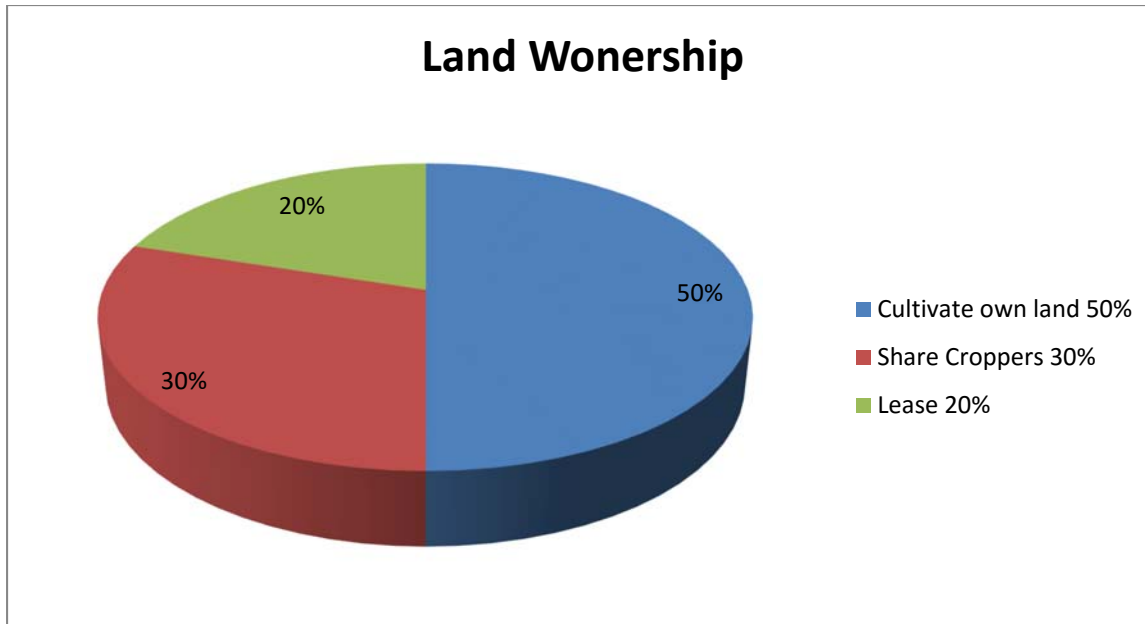
#### **6.4.2 Technologies and Management practices for crop cultivation**

In the polder 43/1A agriculture has been practiced as improved traditional technologies as well as management practices. Farmers mainly used their own seeds except ground nut and potato. Few farmers are use modern technology and high yielding quality seeds but they are not following the recommended dose of fertilizers and also seed rate. Farmers follow the traditional post-harvest activities and processing. The crop production is mainly rain fed only about 660 ha of total 2200 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 drainage and irrigation systems.

#### **6.4.3 Land Ownership**

In polder 43/1A 5% households don't have even homestead. However land is one of the most important resources for livelihood of rural people. Agriculture land is most valued to the poorer rural population. Land ownership plays a vital role to land use and crop production. In this polder, 50% households cultivate their own land, 30% share croppers, and about 20% lease.

In polder 43/1A land ownership category is 17% HHs owned  $\leq 100$  decimal, 22% HHs owned  $\leq 50$  decimal but less than 100 decimal and 56% households owned  $\geq 50$  decimal and 5% are landless HHs.



#### 6.4.4 Major problems and Prospects

- Siltation of outfall revers and canals of the polder
- 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
- Poor marketing channel and less use of information/communication channels

If could overcome or interments to the problems stated then there are many scope to improve in agriculture. Blue Gold may take initiative to improve the irrigation systems through re-excavating of canals and proper maintenance of Sluices/inlets/outlets and though improved water management of 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. It is needed to develop some value chains that are potential to the farmers to available inputs and strengthen outputs marketing channels.

#### 6.4.5 Agricultural Mechanization

Traditional tillage system is rear in this area as farmers are less interested to plowing their land by using cattle but they are interested to use agricultural machinery. Polder 43/1A 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 from other districts, like some big size tractors (local name Hamza) come from Jessore or Khulna.

There is a project, namely “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 implemented 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.

#### 6.4.6 FAO exploring the opportunity for Mechanization in WMG

The essence of Blue Gold is to establish and empower community organizations/water management organizations (WMOs) to sustainably manage their water resources and to make these resources more productive. The explicit objective of Blue Gold is 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.

Independently of Blue Gold, FAO implemented its “Enhancing Food Security through improved crop water management practices in the Southern Coastal areas of Bangladesh’ Project (GCP/BGD/050/NET) project. This included the delivery of mechanization packages to 137 WMG throughout the Blue Gold area. The package included two power tillers, one power thresher, and two Low Lift Pumps to introduce mechanization and to increase irrigated areas. In polder 32/1A, 11 WMs out of 14 have received agricultural mechanization package from FAO. It was the intention that each WMG would form a committee to operate and manage the agricultural machineries as a business and be trained for that purpose.

Blue Gold has drafted a preliminary training curriculum and pilot tested it with two WMG. The curriculum addresses a correct understanding of the ownership of the machinery, a proper understanding of the alternatives to arrange a mechanization service for its members, and the way to manage this along with its bookkeeping requirements. Blue Gold is being providing training to the WMGs having mechanizations by a outsource trainer pool. The aim of training is to develop capacity of WMGs in managing and maintaining the machinery for the purpose of business.

**Table 6.1: List of FAO distributed machinery in Polder 43/1A**

Sl. #	Name of WMG	Power Tiller	Thresher	Pump	Total
1	Raibala	0	0	0	0
2	Khagdon	2	1	2	5

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3	Purba Keowabunia	2	1	2	5
4	Paschim Kawabunia	2	1	2	5
5	Purba Chunakhali	2	1	2	5
6	Paschim Atharagashia Darikata	2	1	2	5
7	Uttar Atharagashia	2	1	2	5
8	Dakshin Angulkata	2	1	2	5
9	Purba Sakharia	2	1	2	5
10	Paschim Sakharia	2	1	2	5
11	Dakshin Sonakhali	2	1	2	5
12	Paschim Sonakhali	2	1	2	5
13	Dakshin Sonakhali Gudanga	0	0	0	0
14	Chowla	0	0	0	0

### 6.4.7 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. One the other hand, late start of rain hampered T-Aus cultivation in some season and also shortage of surface 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 almost all the WMGs of this polder.

### 6.4.8 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 report


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## 6.4.9: 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
<b>Crop Season</b>	Rabi (Winter)			Kharif-1 (Summer)			Kharif-2 (Rainy)			Rabi		
1	T Aman ( HYV)											
2		Mungbean										
3		Peanut										
4		Sesame										
5	Sunflower											
6	Cowpea										Cowpea	
7	Vegetables											
8		Water Melon										
9						Fish (Tilapia & Common Carp)						
10	Chili											

 Land preparation &Sowing

 Vegetative stage

 Riping/Harvesting

## 6.5 Forestry

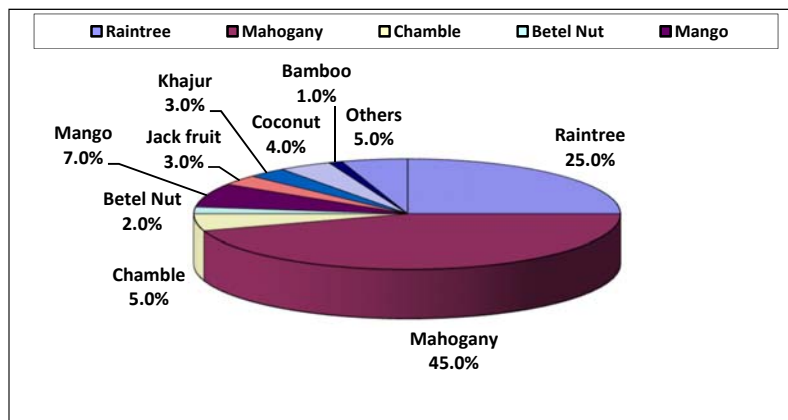
History of plantation in this area is not very old. The population of this area was not habituated to plantation as they were dependent on the natural forest named Sundarbans. Once Barguna district was the part of National forest Sundarbans and there is no locality in this area. Migrated people build today's human habituated by removing the mangrove forest Sundarbans. A long period of time population in this area didn't feel to plantation since they had been meeting their demand from the mangrove forest Sundarbans. When the Sundarbans was restricted by the government then they feel to plantation.

Planned plantation started in this area after liberation of Bangladesh. Plantation is being disseminating to homestead, private, community forest, road side plantation and in wetland floral species.

Forestry is a long term production system, has diverse contribution towards the welfare of mankind, 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).

## 6.6 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, 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 43/1A Mahogany occupies highest number among timber species, which is about 45% Mahogany of the total planned forest. The next is Raintree 25%, Chambol 5%, Betel nut 2%, mango 7.00%, jackfruit 3%, Khajur 3.00%, coconut 4.00%, Bamboo 1.00% and others are 5.00%.

The land use in polder 43/1A is mainly with profuse homestead forest, water bodies (Pond and Canals) fisheries and agricultural land (Crop & Vegetable).

## 6.7 Water Resources

Under ground water of shallow deep zone (50ft.-700ft.) is not suitable to use for irrigation in the dry season (March- May). Moreover, the sweet water layer very deep (900ft.-1000ft.), 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 that source might be used in irrigation especially in dry season. So crops cultivation in this area is rain dependent. Fresh water preservation for irrigation use has not yet well developed. More over saline water intrusion through sluice gates by seepage is making fresh 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 and ponds need to be re-excavated for preserve fresh 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.

In Polder 43/1A, there are 14 WMGs under 2 WMA named Amtola-Chaula Water Management Association and Kewabunia-Mohishkata-Golbunia Water Management Association working in managing the tidal water. In 14 WMGs about 29510 HHs members are involved and benefited through this system.

### 6.7.1 Water Management

There are 14 water management group (WMG) in polder 43/1A. A total of 5105 beneficiary households are involved in the WMGs. All the WMGs are involved in the activities of water resource management, operation and management of the infrastructures and optimal use of water resources in their agricultural productivity and livelihood development.

**Table 6.1: Water Management Groups in the Polder 43/1A**

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	Raibala	195	93	48	141	16310	3100
2	Khagdon	446	244	56	300	27140	4500
3	Purba Keowabunia	290	150	71	221	14780	5180
4	Paschim Kawabunia	531	211	90	301	4740	5050
5	Purba Chunakhali	112	77	49	126	4530	4450
6	Paschim Atharagashia Darikata	327	143	61	202	2940	3600
7	Uttar Atharagashia	396	126	64	190	8320	4820
8	Dakshin Atharogachia	281	136	64	200	7730	4750

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9	Purba Sakharia	430	191	89	208	7280	3750
10	Paschim Sakharia	486	174	46	260	4960	2800
11	Dakshin Sonakhali	367	124	34	158	5950	4050
12	Paschim Sonakhali	415	208	101	309	28220	28700
13	Uttar Sonakhali Gudanga	438	232	45	277	4490	2550
14	Chowla	391	175	86	256	13920	7870
<b>Total</b>		<b>5105</b>	<b>2284</b>	<b>904</b>	<b>3149</b>	<b>151310</b>	<b>85170</b>

**Table 6.2: List of Cannels in the Polder 43/1A**

Sl.#	List of Cannels (Khals)	Length (Km)	Remarks
1	Katakali Khal	0.570km	
2	Laxmipur Khal	1.630km	
3	Laxmipur Branch Khal	0.770km	
4	Golbunia Khal	0.760km	
5	Golbunia Branch (Khejuria) Khal	2.215km	
6	Golbunia Branch (Sahapara) Khal	1.360km	
7	Shakharia Khal	1.185km	
8	Khagdaner Branch Khal -1	1.200km	
9	Taltola Khal	0.860km	
10	Nijkata Khal	1.090km	
11	Chaula Branch Khal -1	1.495km	
12	Chaula Khal	1.070km	
13	Chaula Branch Khal	0.660km	
14	Boloikati Khal	0.725km	
15	Dayeir Khal	1.580km	
16	Keoabunia Branch Khal -1	1.180km	
17	Keoabunia Khal	3.900km	
18	Keoabunia Branch Khal	0.840km	
19	Keoabunia Branch Khal -2	0.440km	
20	Burir Khal	2.270km	
21	Khagdaner Khal	8.730km	
22	Kukua Hazar Takar Badh Khal	4.160km	
23	Awrar Khal	1.730km	
24	Kaminir Khal	0.535km	
25	Kaliyar	1.050km	
26	Taragasia	1.040km	
27	Bastala Khal	0.630km	
28	Kathali Khal	0.560km	

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29	Patabunia Khal	1.610km	
30	Jamiruddin Khal	1.690km	
31	Amtola Branch Khal	1.550km	
32	Newli Khal	1.460km	
33	Kewratala Khal	1.300km	
34	Amtala Khal	4.400km	
35	Hortokiabari Khal	2.350km	
36	Chuddagundar Khal	1.240km	
37	Kartiker Khal	1.100km	
38	Baisrar Khal	2.280km	
39	Baisrar Branch Khal	0.330km	
40	Roybala Khal	1.830km	
41	Roybala Branch Khal	0.850km	
42	Chhota Khal (Garai River)	2.080km	
43	Mahishkata Branch Khal	0.810km	
44	Katali/Katakhal Khal	1.580km	
45	Baular Khal	0.580km	
46	Khatasia Khal	1.585km	
47	Charabunia Khal	1.260km	
48	Godanga	9.070km	
49	Godangar Branch Khal	1.290km	
50	Sonai Sing Branch Khal	0.825km	
51	Sonai Sing Khal	1.800km	
52	Gulbunia Branch (Khunjuria) Khal	2.215km	
53	Khagdaner Branch Khal -1	1.200km	
54	Mohishkata Khal	2.50km	Tentative length 2.50km
55	Tarabunia Khal	1.200km	
56	Ramgatir Khal	0.940km	
57	Kangalir Khal	0.850km	
58	Biswaser Hotar Khal	2.140km	

### 6.7.2 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. There are a huge number of natural water bodies including canals, rivers, sea and wet land in the District Barguna that are main source of fish for household consumption. Beside this, most of the households have one or more ponds for fish culture. The main source of protein of people on this region is fish. In every year a total of 35605.00 mt. fish is produced in Barguna District. Among this 24421.00 mt. is Hilsha fish. 67811 fishermen are involved in fishing of natural fish in this District. Therefore there is a huge potentiality in increase the productivity of natural fish and culture fish in this region.

### 6.7.3 Wet land distribution

The Polder has a total wet land area of 330 hectares which 167 hectares are under aquaculture and 163 hectares are Canals. Aquaculture comprises of homestead pond fish culture, prawn culture and commercial aquaculture. The open water fisheries are consists of river, canal and floodplain.

**Table 6.3: Wetland distribution at polder 43/1A**

Union	No. of Pond (ha.)	Total area (ha.)	Avg. Pond size (deci)
Atharogachia	3753	167	11
Kukua	4195	186	11

Source: Upazila Fisheries office, Amtoli

Polder 43/1A has a total wet land area of 330 hectares of which 167 hectares are under aquaculture and rest 163 hectares are Canals, Boro-pit and permanent water logged area. Most of the households and involved in traditional fish culture and commercial fish culture is rear in this polder. The open water fisheries consist of river, canal and flood plain areas. Some influential persons are culture fish in public water body by making dam on the canals. Traditional fishers are rear in this polder as there are no any big and high tidal rivers adjacent to this polder. Outfall Revers are mostly silted out and they are going to lose their tidal flow.

### 6.7.4 Inputs supply in Fish Culture

Still availability of quality inputs is great concern in fish culture in the polder 43/1A. Although a number of Nurserers and Fry traders are being supplied the fingerling but farmers are not happy with this. Most of the Nursesers are trying to sale of size and more fingerling to the farmers. They do not have any orientation about business and don't consider the farmers as a part or assets of their business. Due to availability of natural fish the farmers in this region are not habituated with the fish culture. They have been followed very traditional method in fish culture. Farmers in this region are not habituate with the feeding of fishes in fish culture. In recent years, there are some development organizations, Blue Gold, RFLDC World Fish, are being supporting farmers in improved farming practice. So, some motivated farmers are trying to apply feed in their ponds but it is very irregular. There are some grocery shops and fertilizer retailers in polder 43/1A supply feed, lime and other ingredients but it is not available in round the year. Although quality is one of the great concerns in supply feed by the retailers.

**Table 6.4: List of fry Nursery owner at Polder 43/1A**

SI #	Name of Nurserer	Father's Name	Village	Type	Mobile no.
1	Muzaffor Peyada	Balu Peyada	Sonakhali	Carp, Tilapia	01719937564
2	Md. Mahubub	Arshed Hawlader	Sonakhali	Carp, Tilapia	01743604054

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3	Md. Mosarrof Hossain	Chan Mia	Sonakhali	Carp, Tilapia	01736911657
4	Md. Moklesh	Mohammad Mridha	Sonakhali	Carp, Tilapia	01929268157
5	Md. Sahjahan	Ali Azim Khan	Madhya Sonakhali	Carp, Tilapia	01934438588
6	Md. Oahab	Aziz Fakir	Madhaya Sonakhali	Carp, Tilapia	01729903203
7	Md. Baker Khan	Belaet Khan	Atharogachia	Carp, Tilapia	01713966859
8	Md. Khalilur Rahman	Arshed Pyada	Golbunia	Carp, Tilapia	01929310336
9	Md. Nur Jamal Hawlader	Kashem Hawlader	Shakharia	Carp, Tilapia	01714729331
10	Sahjahan Mridha	Amjed Ali Mridha	Amragachia	Carp, Tilapia	01716667341
11	Alomgir Mridha	Amjed Ali Mridha	Amragachia	Carp, Tilapia	01726826438
12	Arjan Mollah	Ensan Mollah	Amragachia	Carp, Tilapia	01728873654
13	Ibrahim Mridha	Hasem Mridha	Golbunia	Carp, Tilapia	01727465363
14	Jahir Madbor	Mozibor Madbor	Kewabunia	Carp, Tilapia	01716360560
15	Seral Haque Mridha	Amjed Ali Mridha	Amragachia	Carp, Tilapia	

**Table 6.5: List of fry traders at Polder 43/1A**

SI #	Name of Fry Trader	Father's Name	Village	Union	Mobile no.
1	Rafiq Fakir	Nizam Uddin Fakir	Paschim Chunakhali	Kukua	01738846780
2	Aziz Musulli	Hamed Musulli	Paschim Chunakhali	Kukua	01789386672
3	Razzak Mridha	Aziz Mridha	Amragachia	Kukua	01934170116
4	Jamal Hawlader	Azhar Hawladr	Amragachia	Kukua	01862687015
5	Jasim Mollah	Sattar Mollah	Amragachia	Kukua	01789530273
6	Hanif Mridha	Sader Ali Mridha	Amragachia	Kukua	01778519685
7	Nasir Mridha	Sundor Ali Mridha	Amragachia	Kukua	
8	Ahsan Mridha	Anech Mridha	Amragachia	Kukua	01731645206
9	Sona Mia	Montaz Bayati	Amragachia	Kukua	
10	Saidul Mollah	Jabbar Mollah	Amragachia	Kukua	01729390836
11	Jalil Mridha	Anech Mridha	Amragachia	Kukua	
12	Monir Hawlader		Uttar Amragachua	Kukua	
13	Harun Hawladr	Goni Hawladr	Amragachia	Kukua	01728873654 (R)
14	Delwar Hawlader	Goni Hawlader	Amragachia	Kukua	01728873654 (R)
15	Jakir Hossain	Satter Mollah	Amragachia	Kukua	01729390836
16	Nurul Islam	Sobahan Gazi	Amragachia	Kukua	01788251623
17	Mahbub Mollah	Sahjahan Mollah	Amragachia	Kukua	01754815041
18	Md. Habib	Rustum Pyada	Sonakhali	Atharogachia	01940889535
19	Md. Nasir Uddin	Rustum Pyada	Sonakhali	Atharogachia	01736249458
20	Md. Sona Kha	Kalom Kha	Sonakhali	Atharogachia	
21	Nazrul Islam	Hossen Pyada	Sonakhali	Atharogachia	
22	Nur Alom	Hossen Dacter	Sonakhali	Atharogachia	
23	Barek Pyada	Umer Ali	Sonakhali	Atharogachia	01822808069
24	Md. Liton Dhali	Seraj Dhali	Gazipur	Atharogachia	
25	Afaj Uddin	Jobber Mollah	Gazipur	Atharogachia	

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26	Md. Ripon		Gazipur	Atharogachia	0182283854
27	Md. Lavlu	Md. Nunu Gazi	Gazipur	Atharogachia	
28	Jasim	Yasin	Purba Sakharia	Atharogachia	01795813509
29	Monir	Joynal	Purba Sakharia	Atharogachia	01795813509
30	Mizan	Selim	Purba Sakharia	Atharogachia	01944183285
31	Alim	Hanif	Purba Sakharia	Atharogachia	01943219523
32	Alomgir	Hasan	Purba Sakharia	Atharogachia	01937002751
33	Jalal Sikder	After	Golbunia	Atharogachia	01982774137
34	Esmayl Pyada	Razzak	Golbunia	Atharogachia	01677296071
35	Moksedul Hawlader	Hanif	Golbunia	Atharogachia	01918585692
36	Monir	Joynal	Golbunia	Atharogachia	01795814590
37	Monir Sarder	Jabber	Golbunia	Atharogachia	01910773411
38	Bashir	Jabber	Golbunia	Atharogachia	01948992804

**Table 6.6: Information of major inputs traders in polder 43/1A**

SL #	Name of Traders	Mobile No.	Place of Business	Inputs	Collect inputs from	Peak season
1.	Sultan Hawlader		Chunakhali Bazer	Uria, TSP, MoP, Pesticides Fungicide	Patuakhali, Amtoli	July to Sep.
2.	Fazlul Haque	01724703679	Chunakhali Bazer	Uria, TSP, MoP, Pesticides Fungicide	Patuakhali Amtoli	Do
3.	Nizamud	01732301629	Mohishkata Bazer	Uria, TSP, Pesticide, Oil Cake, Wheat Bran, Pilate Feed, Lime, Fish Feed	Patuakhali Amtoli	Do
4.	Sultan Master	01718569988	Mohishkata Bazer	Uria, TSP, MoP, Pesticides, Fungicide	Patuakhali Amtoli	Do
5.	Sahanoor Pyada	01736728032	Mohishkata Bazer	Uria, TSP, MoP, Pesticides, Fungicide	Patuakhali Amtoli	Do
6.	Kala Mia Khan	01716106352	Mohishkata Bazer	Fertilizer, Pesticide, Fungicide, Oil Cake, Wheat Bran, Fish Feed, Lime, Mega Fish Feed	Patuakhali Amtoli	Do
7.	Nur Khalek	01721902584	Mohishkata Bazer	Fertilizer, Pesticide, Fungicide, Oil Cake, Wheat Bran, Pilate Feed, Lime, Fish Feed	Patuakhali Amtoli	Do

8.	Khalil Pyada	01929310336	Brick Field Bazer	Fertilizer, Pesticide, Fungicide, Oil Cake, Wheat Bran, Pilate Feed, Lime, Fish Feed	Patuakhali Amtoli	Do
9.	Kasem Bepari	01716993855	Sakharia	Fertilizer, Pesticide, Fungicide, Oil Cake, Wheat Bran, Pilate Feed, Lime, Fish Feed	Patuakhali Amtoli	Do
10.	Md. Sahidul Islam	01719562442	Hajar Takar Badh	Fertilizer, Medicin, Pesticide, Fungicide, Lime, Oil Cake, Wheat Bran, Fish Feed	Amtoli	Do
11	Md. Sanu Hawlader	01729902894	Hajar Takar Badh Bazar	Fertilizer, Pesticide, Fungicide, Oil Cake, Wheat Bran, Pilate Feed, Lime, Medicine for Fish	Amtoli	
12	Md. Moksedur Rahman	01713950816	Junior School Bazar	Uria, TSP, MoP, Pesticides, Fungicide	Amtoli	

## 6.8 Livestock and Poultry

In this region, traditionally women are involved in the Poultry and Cattle rearing activities and men as the head of household are in charge (one sense owner) of all the assets and resources. Mainly they managing the field crops production and ultimately responsible for selling almost all types of 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. The government have some special projects to increase female education but it is difficult to have expected result due to social and religious barrier. 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.

95% households are being rearing poultry in small scale in their households. Native hen rearing is a very common in the polder 43/1A and duck rearing is bit less than the hen. More or less 85% households are being rearing ducks. Ducks rearing is less in the high land area since duchs are habituated to wet land areas. This is primarily due to easy access to water bodies by the duck farmers which encourage them to go for large scale farming. Rationale says that

ecological environment of coastal regions is more suitable for fowls and duck production than in any other regions in the country.

Small scale poultry rearing can be an impressive income source for poor and vulnerable women in the rural and coastal areas. 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 43/1A it was observed HHs are rearing duck more or less side by side hens. Natural resources like rivers, canals, ponds and water bodies are supportive this regard with natural feeds and suitable habitats for ducks. 85% of households in this polder rear ducks and it could be increased if it is possible to make available water resources for scavenging the ducks and it is possible by excavating canals and efficient water management.

Almost all the households are rearing native poultry and produce eggs for sale as well as household consumption. Traditionally HHs are being producing chick ling at their home by hatch eggs and rear chicks of marketable size, i.e. 0.8-1.2 kg. There are about 30 paikes (traders) in the polder 43/1A who buy poultry birds and eggs from farmers at Tk. 165 (on average) and sell to arots at Amtoli and Patuakhali. The three main problems facing poultry producers are unavailability of medicine, the absence of vaccinators, and cold-related diseases.

### 6.8.1 Some statistics on livestock at Amtoli Upazila

**Table 6.7: Statistics of livestock and poultry at Amtoli Upzilla**

Types of livestock and poultry	Number
Number of cows	159472
No of buffalo	25180
No of goat	2850
No of ram	590
No of duck	80781
No of hen	184393
Others	26870

Source: Upazila Livestock Office, Amtoli

**Table 6.8: Farm number at Amtoli Upzilla FY 2013-2014**

Cow		Goat		Ram		Duck		Layer		Broiler		Cattle fattening	
Registered	Unregistered	Registered	Unregistered	Registered	Unregistered	Registered	Unregistered	Registered	Unregistered	Registered	Unregistered	Registered	Unregistered
11	20	21	40	4	7	9	22	0	0	61	70	0	0

Source: Upazila livestock office, Amtoli

**Table 6.9: Egg production (In lac) statistics at Amtoli Upzilla FY 2014-2015**



Target	250
Achievement	15
%	6

Source: Upazila livestock office, Amtoli

**Table 6.10: Meat production statistics at Amtoli Upzilla FY 2014-2015 (In MT)**

Target	700
Achievement	100
%	14

Source: Upazila livestock office, Amtoli

**Table 6.11: Vaccination of cattle at Amtoli Upzilla FY 2014-2015**

Target	28000 units
Achievement	13076 units
%	72

Source: Upazila livestock office, Amtoli

**Table 6.12: Vaccination of poultry at Amtoli Upzilla FY 2014-2015**

Target	1100000
Achievement	374800
%	34%

Source: Upazila livestock office, Amtoli

**Table 6.13: Treatment of cattle at Amtoli Upzilla FY 2014-2015**

Target	24000
Achievement	13530
%	56

Source: Upazila livestock office, Amtoli

**Table 6.14: Treatment of poultry at Amtoli Upzilla FY 2014-2015**

Target	80000
Achievement	30570
%	38

Source: Upazila livestock office, Amtoli

**Table 6.15: HHs having livestock and poultry at polder 43/1A**

Livestock/Poultry	Average number	HH (%) of the community
Cattle	3-4	70
Goat/Sheep	3	22
Poultry birds (Hen)	10	95
Duck	10	80

Source: FGD at community

## 6.8.2 Inputs supply situation of Ducks

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

### 6.8.3 Source of inputs

Small scale duck farms are the main source of eggs in this area. They produce eggs mainly for consumption as well as sale in the market. Thus some households are producing ducklings by using traditional method. They actually hatch eggs by the broody hens since ducks are not habituated to brooding. This is due to absence of hatcheries and duckling traders.

### 6.8.4 Hatcheries

It is found that poultry hatchery is totally absence in Patuakhali and Barguna District. There is some traders available in this area are collecting chick and duckling from Khulna, Dhaka, Netrokona and Matheripur. This results in higher transportation cost discouraging in trading ducklings as well as rearing ducks.

### 6.8.5 Feed Sellers

There are 7 number of retail feed sellers inside the polder. Some formal feed sellers are selling inputs including feed in different markets on hat days. There is no any renowned company dealer inside the polder. Retailers just purchase from dealers that are at Upazila and District town like Amtoli Patuakhali and Barguna. So farmers are facing scarcity of inputs round the year.

It is impressive that Agro Inputs Retailers Network (AIRN) a project of USAID working in this area with the aim of availability and access to the quality inputs. Their objective is to build a strong network among farmers, retailers, dealers, supplier and company.

**Table 6.16: List of Poultry feed seller at the polder 43/1A**

#	Name of Seller	Address	Location of Business	Mobile no.
1	Nizamuddin	Kukua	Mohishkata Bazer	01732301629
2	Kala Mia Khan	Kukua	Mohishkata Bazer	
3	Khalil Pyada	Atharogachis	Break Field Bazer	01929310336
4	Kasem Bepari	Atharogachia	Sakharia	01716993855
5	Md. Sahidul Islam	Khakdon	Hajar Takar Badh	01719562442
6	Md. Sanu Hawlader	Khakdan	Hajar Takar Badh Bazar	01729902894
7	Md. Moksedur Rahman	Atharogachia	Junior School Bazar	01713950816

### 6.8.6 Medicine Suppliers and vaccination

Medicine is available in the district and upazila headquarters since the Private pharmaceutical companies have supply operations in District and Upzaila headquarters level but there are some retailer at the polder that are supplied medicines through company distribution channel. So there is little scarcity of medicines but the vaccine problem is big issue in this polder. The polder dwellers have to collect vaccine from upazila or district headquarters. It is very difficult to maintain cool chain as they have to collect vaccine from far distance. Nevertheless very few

number of trained vaccinators and paravets are working in the polder. As a result the farmers could not able to vaccinate their ducks and hens in time. It is very important to maintain vaccine schedule otherwise the vaccine is not work properly.

#### **6.8.7 List of Companies selling medicine at the District and upazilla level**

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

#### **6.8.8 Women participation in Duck rearing**

##### **Input purchase**

Traditionally women are forbidden to go to markets for buying and selling in this area. So there is no any option for women to 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.

##### **Feed collection**

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

##### **Feed preparation**

Household women spent very minimum time to prepare feed for the ducks. Generally they prepare feed 4 times a day. In rainy season they provide snail meet as duck feed also they provide Rice Juice, Rice Bran, Rice and these are available at their house.

##### **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.

##### **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.

##### **Egg Collection**

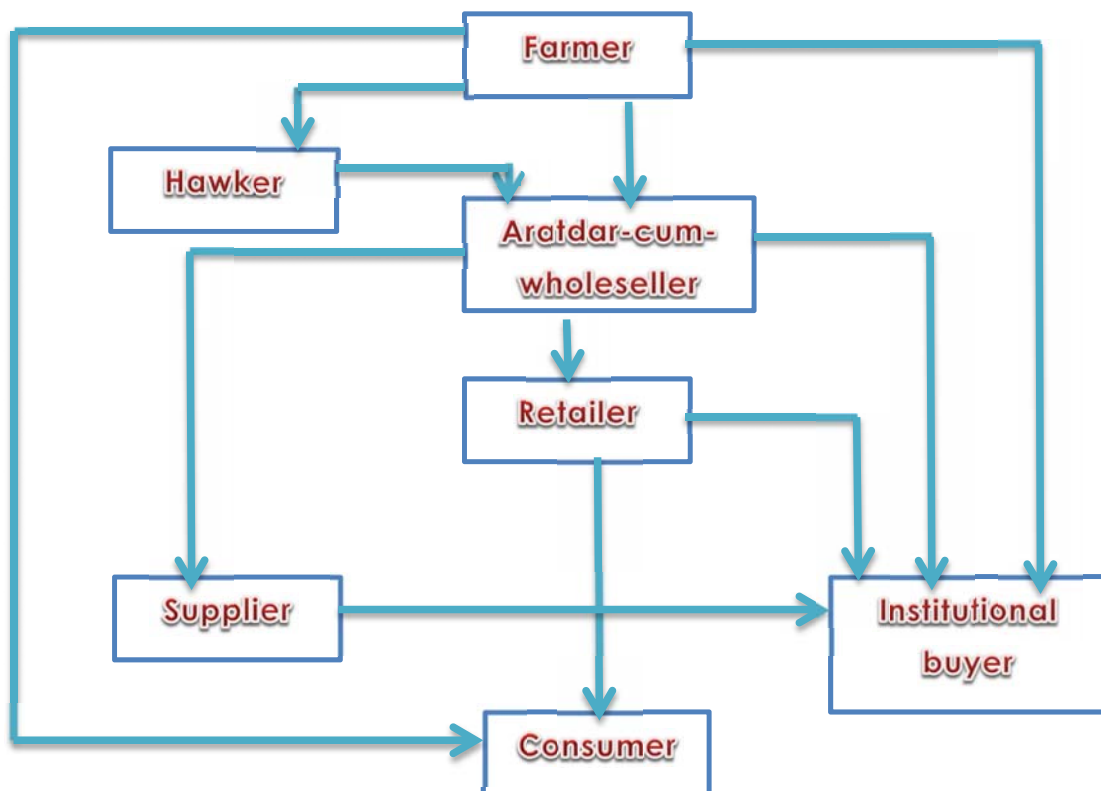
It is the household women who also take care of collecting the eggs every morning, cleaning the eggs and setting the eggs in a basket or bowl filled with rice to keep them safe (unbroken) and fresh for later sales. The process of egg collection and storing takes by females each time.

### 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.

### 6.8.9 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 channels of 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

### 6.8.10 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:

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

### 6.8.11 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.

## 7.0 Gender Perspective of the Polder 43/1A

In near past (15-20 years ago) the society of this area was almost conservative but the situation is being improving from beginning of the decade 2000 since some development projects are being work in socio-economic development of the coastal areas. Now we could say that this area is moderately conservative. It is significant that the rural women of this area are participating in different development work like training, meeting, workshop and also they enrolled in Labor



Conducting Society (LCS) to do the earth work. Thus women of some conservative family still are not allowed

to work in outside of their houses all the cases. So the women participation in the economic activities is still limited but they are actively participated in domestic work of the household like poultry rearing, homestead vegetables gardening, goat/cattle rearing, pond fish culture and other home based IGAs also. Moreover woman actively involves with post-harvest activities of agricultural crop. Overall gender situation is women are involved in different productive and reproductive activities but that are not recognized.

In general, the involvement of women in outside activities is quite limited. Destitute women regularly sell their labor whereas among the women of small farmer households, selling labor is more of an occasional activity. Destitute women earn money by carrying out different activities outside the home, including agriculture, craft making, petty business, earth work, and as housemaids. Some women of vulnerable and single headed households even are go to market for buying and selling goods.

## 8.0 Market infrastructures and Information

There are about 9 local markets/hats in the polder 43/1A and where the dwellers of this polder generally do their marketing and shopping activities. Market information is in below:

**Table 8.1: List of market in polder 43/1A**

Polder	Union	Name of Market	Address/Location	Market/Hat day
43/1A	Atharogachia	Brick Field Bazar	Shakharia, Atharogachia	Tuesday
		Chaula Bazar	Chawla, Atharogachia	Wednesday
		Junior School Bazar	Uttar Atharogachia	Friday
		Budhbarer Bazar	Uttar Sonakhali	Wednesday
		Pagla Selimer Bazar	Dakshin Atharogachia	Monday
	Kukua	Chunakhali Bazar	Purba Chunakhali, Kukua	Saturday
		Hazar Takar Badh Bazer	Khagdon, Kukua	Tuesday

*Pic: Location of Markets (Bazar)*

**Table 8.2: Information of some major traders of above mentioned markets trading Agricultural inputs**

SL #	Name of Traders	Mobile No.	Place of Business	Inputs	Collect inputs from	Peak season
1.	Sultan Hawlader		Chunakhali Bazer	Uria, TSP, MoP, Pesticides, Fungicide	Patuakhali, Amtoli	July to Sep.
2.	Fazlul Haque	01724703679	Chunakhali Bazer	Uria, TSP, MoP, Pesticides, Fungicide	Patuakhali Amtoli	Do
3.	Nizamuddin	01732301629	Mohishkata Bazer	Uria, TSP, MoP, DAP, Pesticide, Fungicide, Oil Cake, Wheat Bran, Pilate Feed, Poultry Feed, Lime, Fish Feed, Spray Machine and other agricultural equipment	Patuakhali Amtoli	Do
4.	Sultan Master	01718569988	Mohishkata Bazer	Uria, TSP, MoP, Pesticides, Fungicide	Patuakhali Amtoli	Do
5.	Sahanoor Pyada	01736728032	Mohishkata Bazer	Uria, TSP, MoP, Pesticides, Fungicide	Patuakhali Amtoli	Do
6.	Kala Mia Khan	01716106352	Mohishkata Bazer	Fertilizer, Pesticide, Fungicide, Oil Cake, Wheat Bran, Fish Feed, Poultry Feed, Lime, Mega Fish Feed, Spray Machine and other agricultural equipment	Patuakhali Amtoli	Do
7.	Nur Khalek	01721902584	Mohishkata Bazer	Sick	Patuakhali Amtoli	Do



8.	Khalil Pyada	01929310336	Brick Field Bazer	Fertilizer, Pesticide, Fungicide, Oil Cake, Wheat Bran, Pilate Feed, Poultry Feed, Lime, Fish Feed	Patuakhali Amtoli	Do
9.	Kasem Bepari	01716993855	Sakharia	Fertilizer, Pesticide, Fungicide, Oil Cake, Wheat Bran, Pilate Feed, Poultry Feed, Lime, Fish Feed	Patuakhali Amtoli	Do
10.	Md. Sahidul Islam	01719562442	Hajar Takar Badh	Fertilizer, Medicin, Pesticide, Fungicide, Seed, Lime, Oil Cake, Wheat Bran, Poultry Feed, Fish Feed	Amtoli	Do
11	Md. Sanu Hawlader	01729902894	Hajar Takar Badh Bazar	Fertilizer, Pesticide, Fungicide, Oil Cake, Wheat Bran, Pilate Feed, Poultry Feed, Lime, Medicine for Fish and Poultry	Amtoli	
12	Md. Moksedur Rahman	01713950816	Junior School Bazar	Uria, TSP, MoP, Pesticides, Fungicide	Amtoli	

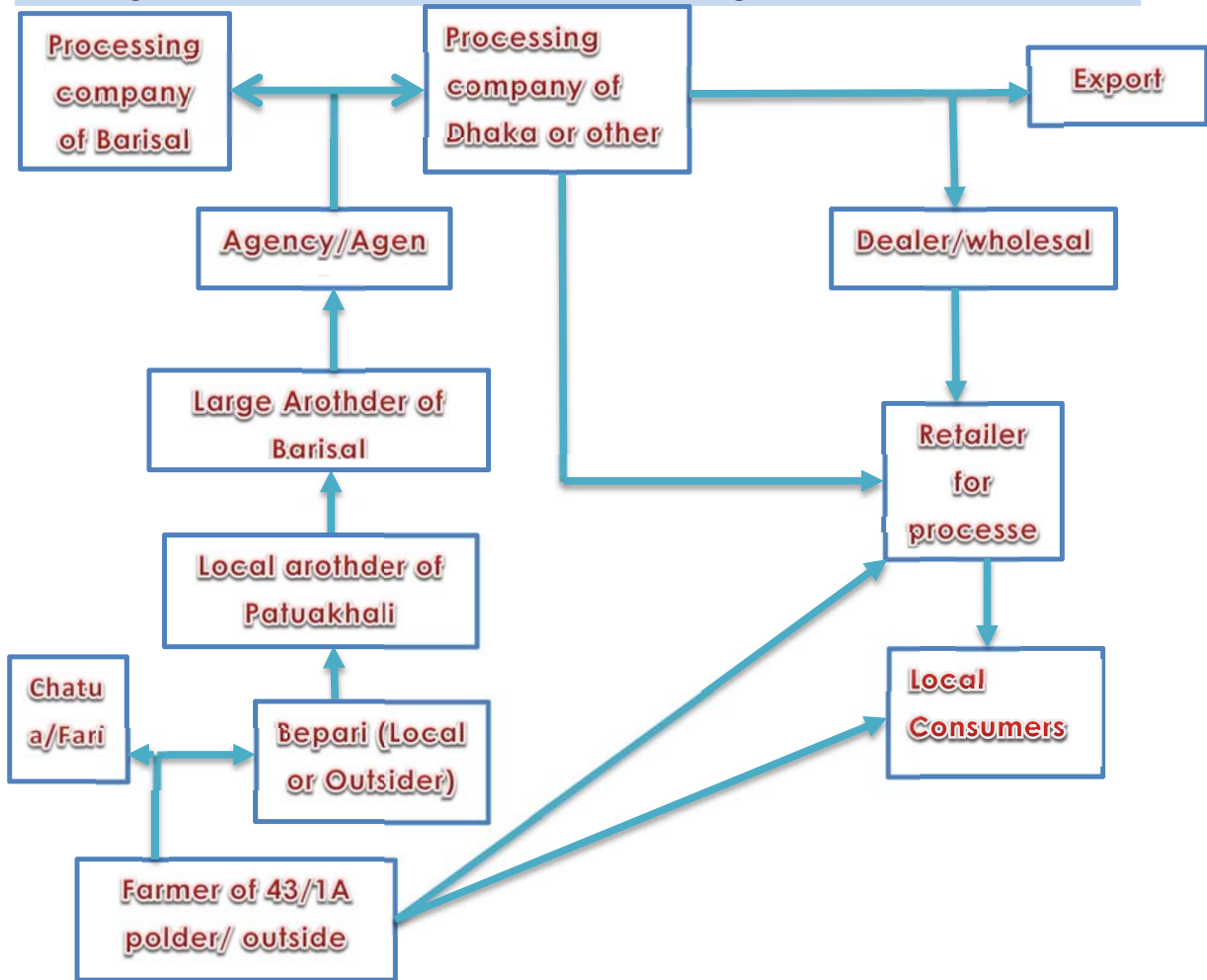
Nly Chunakhali Bazer is the largest Bazer in this polder. A huge amount of money is being trading on every hat day in this Bazar. Other bazars are smaller than the Chunakhali bazar.

## 8.1 Market products

- ⇒ Mug bean, peanut, Keshari, chili, water melon eggs, native chicken, Ducks, Fish, rice and different types of vegetables are the main market products of this polder
- ⇒ Mung Bean and Keshari usually goes to North-west of Bangladesh specially in Baneswar, Rajsahi where these are being processed. Off course the informants don't know the actual flow chart of the products
- ⇒ Generally Bapari/Faria collect peanut, Mug bean, Cowpeas, other types of Beans and rice from local Bazaar or from the farm gate. When they get a bulk volume to Track capacity then they

send this directly to Rajshahi and Dhaka. Because there is no any mill in the region Patuakhali. There are two small mills in Barisal but they are not interested to buy beans and pals from far distance as local produces are enough to their capacity. Ammrta and PRAN are two private companies are being collecting Mung Bean and Peanut from this region but they don't buy directly from the farmers. Both companies have some agents in Barisal who collect from faria and supply it to company. A big gap is that the farmers don't have idea about the rate of the company or any required specification.

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



*Fig: Flow chart of Mung Bean and Keshari*

## 8.2 Output market situation analysis

Usually major products are being purchased by faria and Bapari sometimes directly from the farm gate and sometimes the farmers are bringing to the Arot. There are a number of Arot in the polder 43/1A have some faria or small collectors. They are purchasing agricultural products mainly Rice, Mung, Cowpeas and sesame from village markets and are selling to the arots. 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 Amtoli and Patuakhali by riskshaw/Auto. Bepari and whole seller are mostly doing their business from Amtoli, Chunakhali, Mohishkata and Patuakhali. 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. Very few 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.
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 early season in the rural area with high interest and there is a verbal agreement that the Dadon receiver will bound to give dadonder all the produces.

Dealer	Dealers are licensed agent or seller of seed or fertilizer. They receive a percentage of commission on sale and they are allowed to sale products in retail price. The company offer premium or bonus on extra sale.
Retailer	They sell inputs to the farmers. Retailer collect products from dealer and sale direct to the consumers.

**Table 8.3: List of Puls Peanut and Rice traders**

SI #	Union	Name of Trader	Address	Mobile no.
01	Atharogachia	Madhu Pyada	Hazar Takar Badh	01728415797
02		Barek Hawlader	Sonakhali	01732796790
03		Aziz Hawlader	Golbunia	01734348911
04		Babul Dactar	Golbunia	
05	Kukua	Younus Biswas	Chunakhali	01725173175
06		Mannan Fakir	Chorkhali	01727465295
07		Selim	Chunakhali	01712981103
		Nizam Hawladar	Chunakhali	01714809088

### 8.3 Linkage between Producers and Intermediary

There are some advanced farmers in the polder 43/1A produces a large amount of produces like Rice, Mung, Bean and most of the farmers are subsistence. Some are produces little more produces than requirement of household consumption. Sometimes the volumes producers are selling their produces to distance market direct (Amtoli, Patuakhali). And rest of the surplus farmers are bring their products to the local market and selling the products arot/faria. If the volume of produces large the faria is collecting produces from the farm gate. In case of vegetables and other products producing a small amount at the homestead the Paikar/Foria is not show interest to collect from farm gate as it is small amount but in case of Fish, most cases, faria,paikar is being purchase from the farm gate and it is like a tradition I this area. It seems that ther is no any strong linkage among between the producer and the intermediary. Major cause behind this week linkage is inadequate production volume and very few commercial producers.

### 8.4 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.

In case of vegetable, urban sellers are buying from existing marketing channel/supply chain i.e. wholesale market, mainly (upazilla wholesale market). And most of the arotders are collecting vegetables from the Jessor and Jhinaidah. In case of locally produced vegetable, the producers are bring to the local even also the upazila market by own and there are some small traders who collect from the producer and selling to the consumer. One very good provision in

most of the local markets that the farmers can selling their vegetables by their own and some farmers are avail this provision.

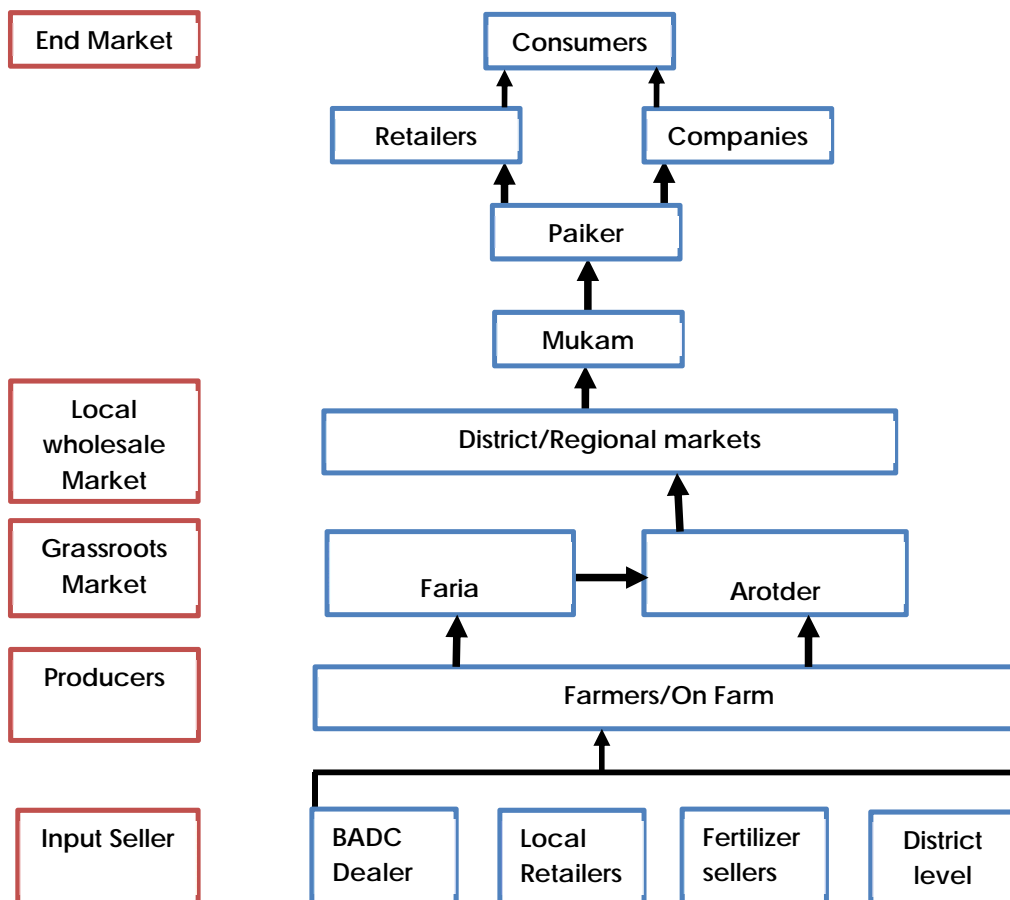
### 8.5 Linkage between Rural Homestead Producers and Urban Consumers

There is no or little linkage between rural homestead producers and urban consumer as the polder 43.1A is far from the Urban area. Patuakhali town and the Amtoli Upazila sadar are the nearer municipal of the polder 43/1A and the distance from the periphery of the polder 12km and 13km. So farmers are not interested to bring their produces to Patuakhali or Amtoli since they need a large amount of money for transportation of their vegetable.

### 8.6 Linkage between Rural Producers and Input Sellers

Input sellers in rural areas do not sell variety of products. They are interested to sale highly profitable product whatever the quality is as their main objective of business is make money not to support farmers. This type of business is possible in this area because the farmers don't have adequate orientation about quality inputs and its effects on the profitability. Sometimes some inputs sellers are selling over dated products and it is possible that the farmers of this area are not care about expiry date of the products. Because of these causes there are no or little trusted inputs sellers and also loyal customers in the polder 43/1A.

### 8.7 Product wise market map/value chain map



## 9.0 Value Chain Analysis and Selection

Polder 43/1A is under Atharogachia and Kukua Union of Amtoli Upaila of Barguna District. It consist of 8 Mauzas and 14 Villages. Total land area of this polder 2675 hectares and Blue Gold benefited area is 2200 hectares. There are 5425 households and total population of this polder is 29510. Agriculture is main source of income of this polder duellers. About 60 to 70% households of this polder is depend on totally Agriculture and 85% households are involved in the sector agriculture. Rice is main crop in the polder 43/1A and 2<sup>nd</sup> potential crop is Mung Bean, then Mung Bean, then Cowpea and then Water Melon. Biside this farmers are produces some other crops like Chili, Sweet Potato, Ground Nuts, Falon, Sesame, Sunflower and different types of vegetable. Sunflower is going to be a very potential crop in this area. The farmers' area showing interest on this as already it shows its potentiality as a cash crop. Fish culture in pond, Poultry and cattle rearing are very common in the polder 43/1A. Almost all households of the polder are rearing native Poultry, Ducks and Cattle in small scale. Commercial farms are very rear in the polder. Beside a little number of Broiler farms no any other commercial farms in the polder. Different types of crops minimize the risk of the farmers. It is found that the main 3 potential products are Mung Bean, Native Poultry and Tilapia to value Chain development in the polder 43/1A.

According to priority list the potential products for value chain development are as follows:

1. Native Poultry
2. Mung Bean
3. Tilapia

Blue Gold Program Matrix for Value Chain Selection Component-04																				<a href="#">Home</a>	
Criteria →	Indicate market level (Local, District, Regional, National, International)	Growth Potential (32)					Impact (32)					Structure of the Industry (15)				Gender & Employment (17)		Collective Action(4)	Risk	Total Weighted Value	Rank
Crop ↓		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 Opportunities		
Weight →		7%	6%	6%	7%	6%	5%	5%	6%	5%	6%	5%	4%	4%	2%	9%	8%	4%		100%	
<b>Food</b>																					
T Aman	National	5	3	3	0	1	5	5	5	3	3	1	1	3	5	0	1	1	0	2.5	6
T-Aus		5	3	5	5	1	3	3	1	3	1	1	1	3	5	0	1	1	0	2.4	7
Cow Pea	National	3	5	3	3	1	3	3	1	3	1	1	5	3	3	1	3	1	5	2.6	5
Mung bean	National	3	5	5	5	3	3	3	5	3	0	3	5	3	5	3	3	5	5	3.7	2
Chilli	Regional	1	3	3	3	1	1	1	3	3	1	1	3	1	1	3	3	3	3	2.2	8
Pea nut	National	1	1	3	3	3	1	1	3	3	1	3	3	1	1	3	1	3	3	2.1	9
Sweetgourd	District	1	1	3	5	1	1	1	1	0	1	1	1	0	0	3	1	1	1.5	12	
Country Bean	District	1	1	1	3	1	1	1	1	0	1	1	0	1	1	3	1	1	1.2	11	
Sweet Potato	District	1	1	3	3	5	1	1	1	3	1	3	1	3	1	1	1	3	1.9	10	
Water Melon	District	3	3	3	3	3	1	3	1	1	3	3	3	3	3	0	5	5	2.7	4	
<b>Aquaculture</b>																					
Tilapia	District	3	3	5	3	5	1	1	5	3	5	5	5	3	5	5	0	1	5	3.3	3
<b>Livestock</b>																					
Native poultry	Regional	3	5	5	5	1	5	5	5	3	5	3	3	5	5	5	5	5	5	4.3	1

Fig: Matrix for Value chain selection

## 9.1 Poultry Value Chain



### 9.1.1 Over view of Native poultry at Polder 43/1A

- ❑ Poultry especially indigenous local breeds rearing is a common practice in the polder 43/1A. More than 90% households are rearing native chicken in the scavenging system. It is like a tradition in the area. Women members of the households are exclusively involved in the native poultry rearing. They rear poultry in small scale, most of the households have 10-20 chickens. They don't have any commercial purpose. Required chicks are produced at the home and they don't have to purchase chicks from any commercial hatchery. Therefore, commercial hatcheries do not produce chicks of native poultry.
- ❑ Average tentative production of native poultry in the polder would be 3500kg and there is a great opportunity to increase production almost double. So native poultry can be a very potential economic and nutritional source if it is possible to develop a value chain in an expected level. Thus average yearly production would be 30,250 kg to 41,250 kg from 58,584 birds. So, average yearly production is 35,750 kg from 28,600 birds. Among the 58,584 birds only 7,000 birds lay eggs. Due to bad management, the production

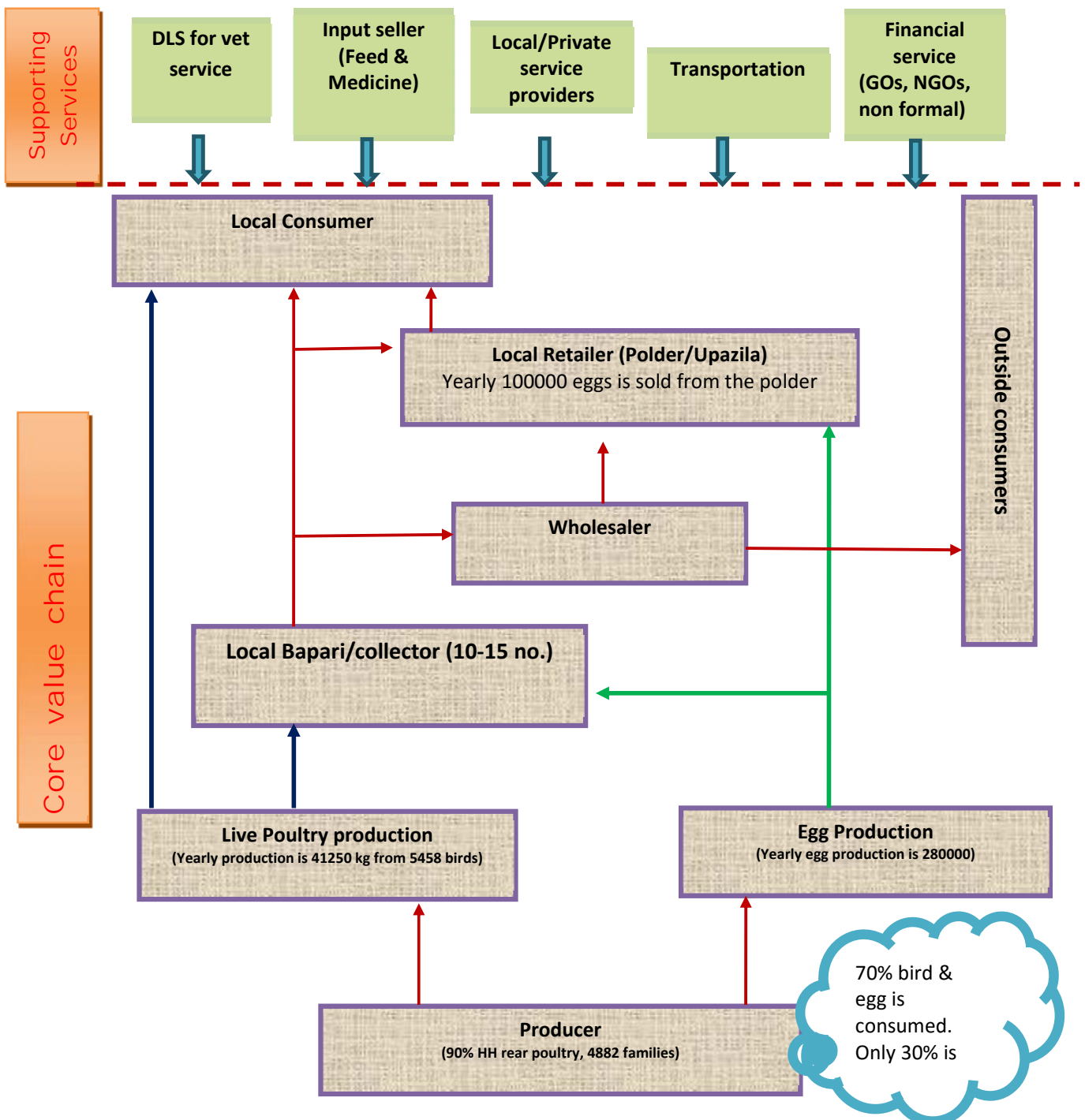
of eggs are very low to the expectation. Yearly egg production from a bird is 40 on an average and thus total egg production at polder 43/1A is about 280000. 60-70% egg is consumed by the polder dwellers. It means yearly near about 100000 eggs come to the market from the polder. On an average, 1923 nos. of eggs go to the market per week from the polder.

### 9.1.2 Objective

- ❑ To define the opportunities for market development in the poultry market system (for native chicken and eggs specifically) at polder 43/1A. This would be a primary over view of the value chain which will facilitate further in depth analysis.
- ❑ To determine the potentialities for poultry value chain development at polder 43/1A
- ❑ To Provide an over view of different stake holders and how they are interlink



### 9.1.3 Native Poultry Value Chain Map



**Fig: Value Chain Map of native Poultry & Egg of Polder 43/1A**

**9.1.4 Methodology**

This documents was developed with the information collected from the discussion with different stakeholders at polder 43/1A from March 2015 to May 2015. 10 FGD and KII have been conducted to collect the data and information. Main objective of FGDs and KIIs to develop the Master file for the polder 43/1A. The Key informants and participants of FGD were producers (men & women), consumers, inputs traders, market treders, service traders and DLS personnel.

**9.1.5 Limitation:**

There is no any survey data on polder 43/1A and also Upazila Livestock office don't have Village or polder wise data. So I had to depend on the KII and FGD to collect data. Calculation of data based on measurement and discussion with stakeholders of the polder. Measurements are based on the random sampling. So there is a possibility of error in the data.

**9.1.6 Core Market actors and their function**

**Table 9.1 List of core actors of native poultry value Chain at polder 43/1A**

SL	Type of Actor	Total No.
01	Producer	4882
02	Bapari/collector	12-15
03	Poultry retailer	0
04	Egg Retailer	14-18
05	Processor (Bakery)	01
06	Input traders (Feed, medicine)	07

**Table 9.2: List of some actors involved in the native poultry value chain:**

Sl.	Name	Address	Activity involved
1	Nizamud	Mohishkata Bazer	Poultry Feed and Medicine
2	Kala Mia Khan	Mohishkata Bazer	Poultry Feed and Medicine
3	Khalil Pyada	Brick Field Bazer	Poultry Feed and Medicine
4	Kasem Bepari	Shakharia	Poultry Feed and Medicine
5	Md. Sanu Hawlader	Hazar Takar Badh	Poultry Feed and Medicine
6	Md. Sahidul Islam	Hazar Takar Badh	Poultry Feed and Medicine
7	Abu Saleh	Hazar Takar Badh	Egg, Poultry collector
8	Abu Talef	Hazar Takar Badh	Egg, Poultry collector
9	Abbas Khan	Shaheb Bari	Egg, Poultry collector
10	Md. Lito	Azimpur	Poultry collector
11	Anwer Peyada	Chunakhali Bazer	Poultry collector
12	Razzak Peyada	Chunakhali Bazer	Poultry collector
13	Monir Hawlader	Chunakhali Bazer	Poultry collector
14	Jalal Hawlader	Chunakhali Bazer	Poultry collector
15	Nizam Sikder	Brick Field Bazer	Poultry collector
16	Khalil Sikder	Golbunia	Poultry collector

### 9.1.7 Poultry Production

Almost every family (90%) of the polder rears poultry. About 100% of them rear native poultry. This indigenous breed is more disease resistant and well adopted in the local environment. This breed is low productivity. But the main potentiality is a huge market demand. The price of native poultry is almost double than the commercial one due to organic point of view, test and preferences. Farmer doesn't use ready feed or medicine. The laying birds lay egg which has also high market price although the size and weight is lower than the commercial one due to same reason. It meat their family nutrition and considered as asset which help to meet the sudden crisis. This is fully a women intervention. There is an opportunities to increase the number of birds per family within their present resource available. Disease outbreak and

sudden death is considered the main problem for the growth of this sector. Technical knowledge gap, unavailability of vaccine and vaccinators is the root cause of this situation.

### 9.1.8 Chicken collection and marketing

Women are involved in marketing at farm gate where as males sell in local market or town. Bapari, Foria or middlemen are involved with poultry trading. They rely on walking or bicycle to collect birds from the village. They supply to the upazila or district market. At local level usually local farmers come with their birds. Sometime the farmers sell their bird to the “Amtoli Bazer” “Patuakhali new market”, “Puran Bazar” or “Badura Bazar”. For transportation they usually use bi-cycle or auto. The collectors sell the birds to the retailers or whole sellers at upper markets that are Patuakhali New AMrket, Puran Bazer and Amtoli Bazer. . A portion of the birds finally go outside the district, like- Dhaka, Barisal etc. which would be 50% of the total collection. They transport the birds to distance market like Dhaka or Barisal mainly by Launch sometimes they transport birds in distance market by roof of the Bus.

### 9.1.9 Support actors' function

#### Advisory service

- ❑ Most of the fatal and serious poultry diseases of the area have available vaccine. Farmers only give vaccine when any service providers come to there household and push the vaccine their poultry. A reliable supply of vaccine, with a cold chain for storage and distribution is critical here. Some individuals in the village work as vaccinators but their services are constrained by inadequate training and communication and vaccine supply from DLS. There is a private company FnF retailing the vaccines but that are not available in the polder since they don't have any retailer in the rural areas. Existing poultry workers do not interested to buy the vaccine from the private company since their price is high then the DLS.
- ❑ DLS is the public service provider which has manpower shortage. Although the DLS is being trying to develop vaccinators in the rural area through training and there are a numbers of individuals having training from DLS but most of them don't provide vaccination service. There are some paravets who provides paid service but for poultry they have no motivation since they can earn more from the cattle treatment then vaccination of polultry. Different projects are working in this area, sometime providing service for their stakeholders.

## **Financial Service**

- There are some national and local Micro Finance Institutes in this area who have provision for poultry or agricultural loan. But as about 100% farmers are subsistence farmer, they have less motivation for getting credit for poultry rearing in large scale.

### **9.1.10 Business Enabling Environment**

- There is a risk for New castle disease and Bird flu disease. But there is limited precaution for prevention, like- transportation, Processing etc.
- Quality control measure is not effective for inputs, like- feed, medicine, vaccine etc
- Organic or native bird has an increasing demand due to health consciousness.
- The small scale native poultry rearing can be an income generating activity for the women if the improved management system is to be followed.

### **9.1.11 Potentiality of Poultry**

- Almost every family of this polder is involved with poultry rearing (90-95%), Native chick.
- Have a good growth potentiality as demand for native poultry and deshi egg is increasing within the country, high price
- This is a pro-poor potentiality. A farmer even with only homestead can rear poultry.
- It is a women intervention and a family business
- The income come from this sector mostly goes to the pocket of women
- Very easy technology and every family have the skill
- It require minimum investment
- Native chicken has higher market demand and a higher market price
- It is also a part of FFS module of component-3 of Blue Gold Program
- It provides protein nutrition for the family and contribute in family crisis

### **9.1.12 Constrain**

- Farmers don't have knowledge on Improved production system
- Production is still at a subsistence level
- Unavailability of quality day old chicks
- Vaccine and medicine is not available in the polder

- ❑ Vaccination and veterinary service system is weak and not available
- ❑ Outbreak of diseases sometime causes massive loss

## 9.2 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. *Mungbeab is one of the major cash crop in polder 43/1A.* Mungbean (*Vigna radiata*) is widely grown in Bangladesh. Mungbean grain contains 19.5% to 28.5% protein. Now a days, it is being cultivated after harvesting of Rabi crops (wheat, mustard, lentil, etc.). As mungbean is a short duration crop, it can fit in as a cash crop between major cropping seasons.

### 9.2.1 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.

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.

### 9.2.2 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 9.3: 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.

### 9.2.3 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 and marketing systems. Also, research and extension are poorly linked.

### 9.2.4 Improper cropping pattern

The cropping pattern habituated farmers to cultivate Mung Bean in late season since they used T-amon for Mung Bean cultivate. T-amon harvesting time of T-mamon is late in this area so farmers are bound to cultivate Mung Bean in late season. 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 also causes late sowing of Mungbean.

### 9.2.5 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.

### 9.2.6 Opportunity to increase productivity and profitability

A farmer usually receives 2-4 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 and BINA Mung supposedly yields higher and is pest resistant. But the seeds are not available in the local market.



Photo: FGD with the experienced farmers

**Table 9.4: 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
<b>Total Production cost</b>		<b>10660</b>

**Table 9.5: Productivity of Mung- Current and Potential (100 decimal land)**

Current (kg/ decimal)	Potential (with intervention) (kg/ decimal)
2.5	8

### 9.2.7 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 area.



### 9.2.8 Grading/ Processing

Farmers can get higher price of Mung Bean if it is possible to grading since most of the buyers like to purchase graded Mung. Price of small grain Mung is higher then the larg grain and price of mixed mung is lower than the large one. So grading can be an opportunity for the farmers. A Faria (buyer) Altef Fakir has a plan to establish a grading machine.

### 9.2.9 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 9.6: Comparative Price at Different Levels (TK/ kg)**

Type	Price at farm gate	Faria	Arot
Large grain	TK. 54-58	TK. 58-62	TK. 62-72
Small Grain	Tk. 68-73	Tk. 72-77	Tk. 76-80
Mixed	Tk. 40-45	Tk. 44-48	Tk. 47-51

### 9.2.10 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 43/2D in Auliapur Union and Marichbunia Union. Experience of Farmers' Business School (FBS) will help us as well as farmers to work in a cooperative approach. WMG and WMA can be the strong platform to work in a cooperative approach. In the mean time c-4 of Blue Gold program is initiated Mung Bean MFS in polder 43/1A. One of the main objectives of MFS is to support WMG members to carry out business activities collectively.

### **9.2.11 Lack of local processing facilities**

There are only two large scale pulse crushing mills in Barisal and most mills are at the Baneswer Rajshahi. Pulses and oil crops produced in the project region are sold to arots in Patuakhali Pura Bazar, Kalapara and bulking volume then transported to Baneswer, 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.

### **9.2.12 Problems with the backward linkages (Access to inputs)**

#### **Weak seed distribution and marketing operations**

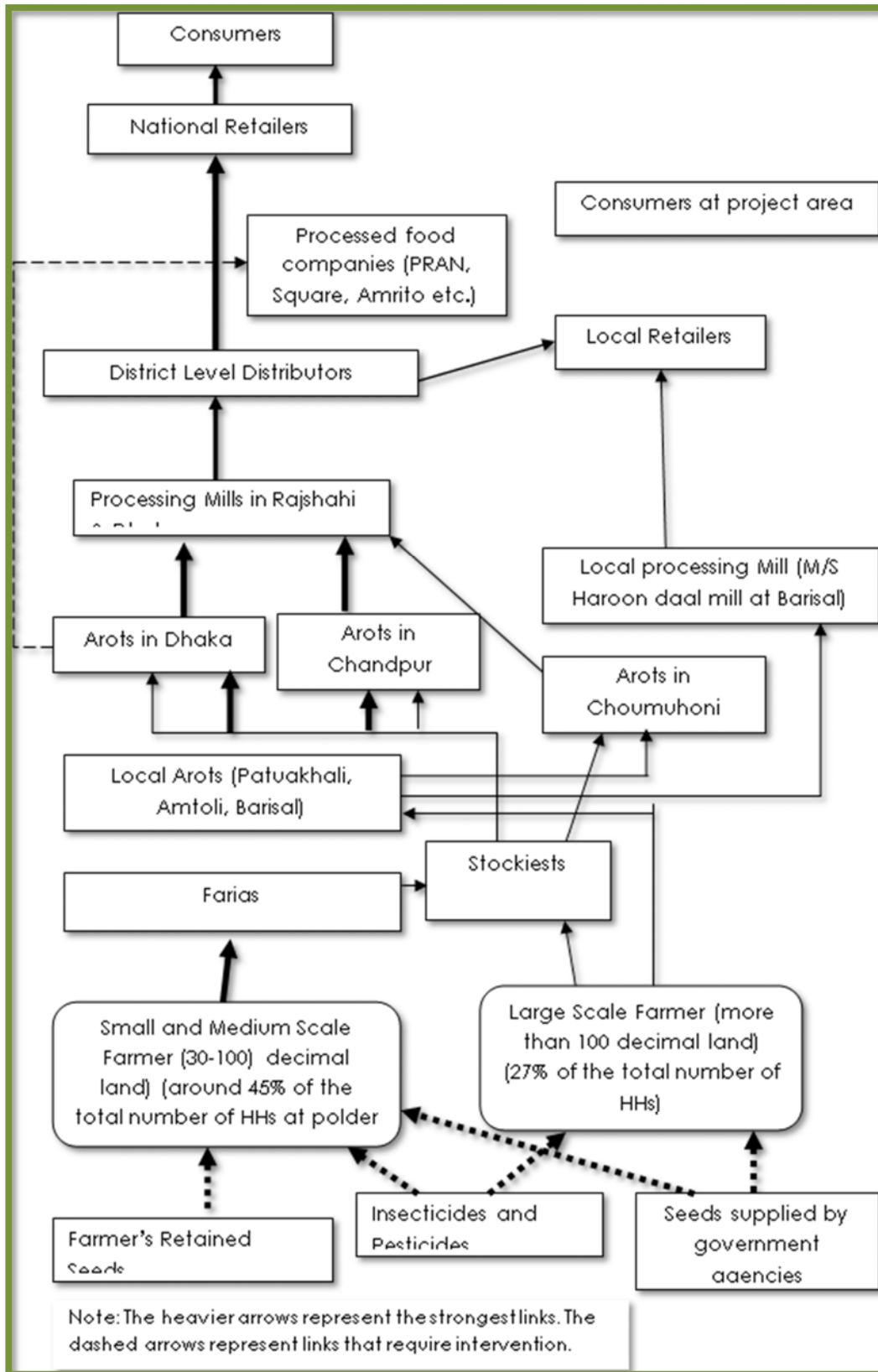
Farmers' in the project area uses retain seeds and have the perception that the seeds used by them are of good quality. However, high yielding varieties like BARI Mung and BINA Mungs are not available in the polder area. Not all farmers have even heard of such varieties. Given that mung bean seeds are 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/Project 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.

#### **9.2.12 Flow chart: Pulse (Mung bean) Value Chain**



### 9.2.13 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 Amrito, 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.

### **9.2.14. Some recommendation to increase production of mung bean at polder 43/1A**

- Creating access to BARI MUNG 5 & 6 and BINA Mung 5 and 8 through collaboration with BADC, input marketing companies and also retailers
- Improved knowledge and promotion of IPM through insecticide and pesticide marketing companies
- Organizing demonstration plots under MFS.
- Organizing demonstration plots through insecticide and pesticide marketing companies.

## **9.3 Tilapia Value Chain**



Through Value Chain Selection Matrix select the Tilapia value chains as a potential in polders 43/1A. Following an extensive set of criteria in a Value Chain Selection Matrix Tilapia was identified as the appropriate fish for value chain development activities in these polders. This matrix facilitated unbiased selection following a scoring system aligned with the project objectives. It complies with the beneficiary focus of Blue Gold and in particular stands to benefit the less food secure households with lower levels of land ownership.

About 60 to 70 percent of the households in these polders have seasonal ponds of around 10 decimal. These ponds are very suitable for Tilapia culture. Tilapia has great potential in terms of food security and nutritional benefit. Tilapia is becoming popular among consumers because of taste and having fewer bones it is easier to eat. Tilapia seems to be accepted by all religious, social and economic groups not only in the polder area or Barisal region but also all over in Bangladesh. The price of Tilapia is comparatively lower than of other fishes which increase its relevance as a good source of protein for polder dwellers with lower levels of income. Implementing this fish culture will involve the women and has the possibility to empower them as well. Tilapia culture can support small and marginal households to meet their family nutrition and to realize an additional income, contributing to poverty reduction.

### 9.3.1 End Market and Market Level Analysis

#### Market for Tilapia

The end-market of Tilapia can be local, regional and national. The main market for Tilapia practically refers to the local markets in the polders (Chunakhali Bazer, Mohishkata, Hazar Takar Badh Bazer, Brick Field Bazer, Junior School Bazer and Chawla Bazer). The tilapia produced in polders 43/1A is mostly consumed by polder dwellers themselves. The economic status of the polder dwellers as well as most other people in the south-east coastal region is very poor. As the price of Tilapia is comparatively low, it has a great demand in the whole of this region. Only about 10% of the local demand of Tilapia in polders 43/1A is met from within the polder, the remaining 90% is supplied from outside the Patuakhali and Barguna districts. As a result only the local market for tilapia is considered as end-market.

### Availability of Ponds

About 90% of the HH in the polders have ponds which are mainly incidental ponds. These ponds are mainly created by digging ditches to collect soil for improving homestead structures. Originally these ponds are not meant for fish culture but Tilapia cultivation is possible and feasible in these small ponds. Of the total number of ponds 60-70% are seasonal ponds usually smaller than ten decimal. Tilapia culture is possible in any size of pond, which is important as small farmers can cultivate Tilapia in their homestead ponds. Moreover, the Southern region has favourable ecological conditions for Tilapia farming. Tilapia has a short production period (3-4 months) compared to other fish. It can be cultivated with other carp fish which is an added advantage for the farmers. Tilapia is famous for its disease resistance and as a result gives a farmer a guaranteed return on his/her investment. Tilapia can be cultivated in high density.

### Production Potential

Polder 43/1A has a total wetland area of 330 hectare of which 320 hectare under aquaculture. 167 hectares under homestead fish culture and 153 hectares are mainly the cannels and it is the main source of capture fish. There is no Prawn culture and commercial fish culture in the polder 43/1A. The open water fisheries consist of canal and floodplain with a water area of 200 hectare.

**Table 9.7: Area Coverage under Different Types of Aquaculture**

Polder	Wetland Area (He)	Area Under Aquaculture	Area Under Homestead fish culture	Area under Commercial fish culture	Area Under Prawn Culture
43/1A	330	320	167	0	0

The land under homestead fish culture can be considered as potential area for promoting Genetically Improved Farm Tilapia (GIFT) culture. It consists mainly of ponds. In the polder 43/1A, most of the households having small and seasonal pond and these are suitable for GIFT culture as GIFT is a rapid growing fish. It is possible to harvest it after 2-3 Months to stocking. It could be a source of family nutrition.

### Species/Variety

Tilapia has become the world's second most important cultured fish after carp. There is a long history of Tilapia farming in Bangladesh. The Mozambique Tilapia (*Oreochromis mossambicus*) was introduced to Bangladesh from Thailand in 1954. However, this species was not widely accepted for aquaculture because of its early maturation and prolific breeding leading to overcrowded ponds.

GIFT was introduced to Bangladesh by ICLARM (International Centre for Living Aquatic Resources Management, now known as the WorldFish Centre) and BFRI (Bangladesh Fisheries Research Institute) in 1994. In addition the technology of Sex-reversed male Tilapia (i.e. mono-sex Tilapia) was introduced to avoid unwanted reproduction and to promote faster growth. The culture of mono-sex tilapia requires extensive feeding though, making it not a viable proposition for small resource starved farmers of the polder region. However, the introduction of GIFT and its subsequent strains contributed to the dramatic increase of Tilapia

in Bangladesh. Farmers have just started GIFT cultivation in Southern Bangladesh with different species of carp. Tilapia has huge market demand and consumer acceptance. Moreover, due to its attractive price, there is scope of expanding Tilapia in the polders and its neighbouring areas.

### **Culture Practices**

Commercial farmers start in mid April/May, they stock fingerling in ponds from as early as April/May and harvest Tilapia after 3/4 months intervals. In contrast, due to scarcity of water most of the subsistence farmers usually start June-July that is just the beginning of monsoon and complete the Tilapia harvest in a single cycle at the beginning of the dry season in November/December. This period is very crucial in terms of financial management at house hold level, as farmers prepare for T. Aman cultivation in this period. So, investment in Tilapia (usually undertaken by female farmers) in pond preparation (lime, fertilizer), fingerling purchase and feeding can face competition with T. Aman. Clearly, a good planning and sourcing of funds is important. Usually women are managing homestead aquaculture though they lack the appropriate knowledge on quality fingerlings and feed.

Fish farming at Polder 43/1A is actually season based and concentrates in places where rain water is trapped during monsoon usually in small ponds for aquaculture. Tilapia culture is dependent on fry producers (hatcheries, nurseries and big farmers) from both inside and outside of the polder. Farmers of this region usually don't use commercial feed. Farmers sometimes provide homemade feed, like- rice bran, oil cake, and/or kitchen residue when available. Small pond owners produce fish (Tilapia and others) for house hold consumption without much focus on income generation through selling the excess.

### **Production Trend**

Over the last few years, total Tilapia production at Patuakhali and Barguna district has increased more than four times. Five years ago only 5-10% farmers used to cultivate Tilapia, but at present about 60-70% of the farmers culture Tilapia with other fish (mainly carp) in their ponds in a mix culture. GIFT Tilapia culture is also getting popular as it can be produced without much commercial feed and culture expense is comparatively low.

Farmers are involved in Tilapia farming with other fish (carp) in polders 43/1A. These farmers buy fingerlings from the fry producers, patilwala/hawkers and produce marketable sized Tilapia. Normally it would take 3-4 months for the farmer to produce an edible size of Tilapia but farmers start to consume from their own production much earlier.



### Productivity

The production of Tilapia in polder area is very low, only 4-6kg per decimal. At smallholder farmer level, culture practice, input utilization and commercial motivation is very poor. There is a huge opportunity for productivity increase in the existing ponds. By introducing new culture and management practices, there is an opportunity to at least double the production from present levels. This still remains far below standard commercial farm production of up to 20-22kg Tilapia per decimal following a semi-intensive method of farming.



The major constraint to productivity is that GIFT Tilapia in general is relatively new but has high yield potential—particularly if practices can be improved. The major constraints can be listed as:

- Lack of knowledge related with pond preparation and intercultural operation-joint production of different fish culture.
- Tilapia fingerlings are suffering from inbreeding deterioration.
- Farmers apply inappropriate stocking ratio and density.
- Traditional farmers are not used to feeding and lack knowledge about proper feeding methods.
- Lack of knowledge about appropriate fish culture due to non-existence of support services.

### Extensive production technology

It appears inherent to farming tradition that fish including Tilapia can be cultured with a minimum of care. Small and marginal farmers apply, if anything, seldom more than lime at the time of pond preparation. Usually pond preparation takes place in May at the advent of monsoon and farmers then wait for rain water to fill the pond. When the pond is ready, farmers purchase fingerlings from patilwalas or directly from fingerling producers. Due to lack of knowledge and awareness, their stocking rate is usually about 500 fingerlings per decimal, which is way above the prescribed rate of 100-120 per decimal and a barrier for proper growth of fingerlings. On the other hand traditionally farmers do not purchase feed and seldom feed regularly due to a lack of financial means as they set aside any funds for T. Aman cultivation. They also lack knowledge about the benefit of using feed. Only seldom they provide household residual food in the pond. This practice is impeding the growth of this overcrowded pond. Thus fingerlings do not grow properly and the output is very low and farmers actually fail to make a profit. However, the formulation of local level feed with locally available ingredients like dry fish, rice bran, maize, oil cake can enhance the productivity of Tilapia if behavioural change can be brought in.

### Harvesting

Usually farmers start harvesting fish after two months of fingerling release for house hold consumption. It is usually women who catch these small fishes by angling. At the beginning of

winter in the months of November-December, when water level starts decreasing, they harvest the few remaining fishes that are still available using a fishing-net, sometimes with the help of other farmers. This time the catch may be a little bit bigger. Farmers can sell the Tilapia of the final harvest (if the catch is large enough) to neighbours, at farm gate or at the nearby market.

### 9.3.2 Marketing

#### Sorting of Tilapia according to size

There are not many options for Tilapia value addition open to small and marginal farmers at polder level. Relatively larger size Tilapia can get a better price per kilogram compared to small size Tilapia (e.g. one Tilapia that weight 200 gram can attract Tk. 10-25 more per kilogram compared to Tilapia that weight 50-80 gram). In general grading to size at farmer level is absent.

#### Local Markets for Tilapia

Farmers usually sell small Tilapia at the rate of Tk. 90-115/kg to neighbours, fish collectors at farm gate or at nearby markets. Selling Tilapia is not a problem. They can also take it to a nearby aroth. There are a few fish traders who will go to the pond site if they are contacted early and if the potential quantity is big enough to cover associated costs. From aroths, local traders' purchases fishes and then they retail those mainly in local markets.

There is no any aroth in polder 43/1A. Thus there are some fish traders in the polder purchase direct from farmers and sometimes collect from Amtoli and selling in deferent markets of the polder.

### 9.3.3 Profitability

#### Production Cost

**Table 9.3.8: Cost of Production for Tilapia (10 decimal)**

Production Cost	Common practice	With limited Input	Ideal condition
Cost Item	Cost (BDT)	Cost (BDT)	Cost (BDT)
Pond Preparation	125 (Use only lime)	650 (Use lime & fertilizer )	650(Use lime & fertilizer )
Fingerling	4500 (Over stocking)	1800	1800
Feeding	500 (Use HH by-products)	4500 (Local feed)	8000 (Use commercial feed)
Fertilization (after stocking)	-	-	500
Harvesting	-	500	500
<b>Total Production cost</b>	5125	7450	13950
<b>Production</b>	60Kg	120Kg	200Kg

#### Yield

A farmer usually achieves a yield of 4-6 kg per decimal with traditional practice that is associated with minimum pond preparation, high stocking density and very limited feeding. By implementing improved culture practices including appropriate pond preparation, using good

quality fingerlings and providing appropriate feed, the maximum production that can be achieved is 20-22 kg per decimal<sup>1</sup>.

**Table 9.3.9: Productivity of Tilapia-Current and Potential (1 decimal)**

Current (kg/dec)	With intervention (kg/dec)	Highest Potential (kg/dec)
4-6	10-12	20-22

**Table 9.3.10: Comparative Price at Different Levels (Tk/ kg)**

Crop	Price at farm gate	Trader	Consumer
GIFT Tilapia	TK 90-100	TK 105-115	TK 115-125

### Margins and Profit

It is interesting to note that farmers are actually making a minimum of profit by producing Tilapia in a traditional way. In traditional practice, in a ten decimal pond, production cost is estimated at Tk. 5125, but the production value is only Tk. 6.000 (a profit of Tk. 875), mainly due to low productivity (only 60 kg fish due to high stocking density and limited feeding). In contrast 200 kg of comparatively large fish can be produced in the same pond if improved culture practice can be followed. The production value is then Tk. 24.000 with more than Tk. 10.000 profit and a Return on Investment (RoI) of 72% (Table-5)

**Table 9.3.11: Profit Calculation –Tilapia (Tk/10 decimal)**

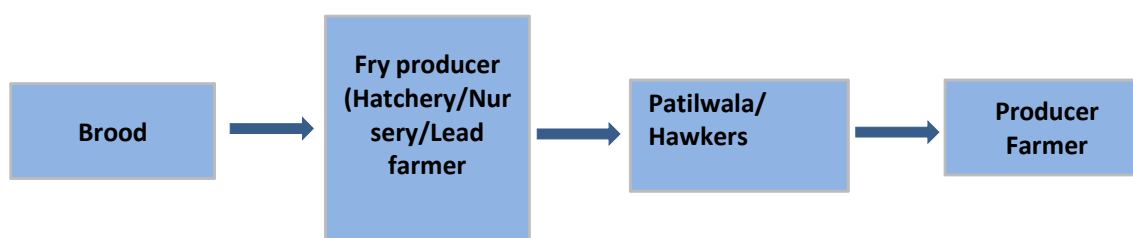
Production Cost	Common practice	With limited Input	Ideal condition
<b>Cost Item</b>	<b>Cost (BDT)</b>	<b>Cost (BDT)</b>	<b>Cost (BDT)</b>
<b>Pond Preparation</b>	125 (Use only lime)	650 (Use lime & fertilizer )	650(Use lime & fertilizer )
<b>Fingerling</b>	4500 (Over stocking)	1800	1800
<b>Feeding</b>	500 (Use HH by-products)	4500 (Local feed)	10500 (Use commercial feed)
<b>Fertilization (after stock)</b>	-	500	500
<b>Harvesting</b>	-	500	500
<b>Total Production cost</b>	5125	7950	13950
<b>Production</b>	60Kg	120Kg	200Kg
<b>Sales Price (Tk./kg)</b>	100	110	120
<b>Income (TK.)</b>	6000	13200	24000
<b>Profit (Tk.)</b>	875	5250	10050
<b>RoI</b>	17%	66%	72%

<sup>1</sup> As commented by Worldfish experts.

### 9.3.4 Backward linkages

#### Brood Supply:

In order to produce Tilapia fingerlings good quality brood stock is needed. Fry producers start to collect brood and produce fingerlings from the beginning of March. The supply of good quality brood is not sufficient. Fry producers are collecting broods from BFRI, Mymensingh and from other hatcheries/farmers through personal connections. It is a great impediment for the production of quality spawn and fingerlings. Only World Fish is working with hatcheries to improve brood of Tilapia. World Fish had collected good quality brood from foreign sources and FRIs and distributed those to some large hatcheries.



#### Fingerling Producer:

Fingerling is produced by hatcheries, nurseries and large farmers. One hatchery, 20-25 fry producers (nursery operator) along with some lead farmers are producing GIFT Tilapia fingerlings in the region.

#### Nursery:

At present, there are about 15 nurseries in polder 43/1A. There exist some other nurseries outside the polders, from where Tilapia fingerlings come into the polder. The main motivation or business of these nurseries is to sell fingerling. Some of them culture the remainder of unsold fingerlings. Most of the nurseries produce GIFT Tilapia due to its market demand in this region.

**Table 9.3.12 List of fry Nursery owner at Polder 43/1A**

SI #	Name of Nurserer	Father's Name	Village	Type	Mobile no.
1	Muzaffor Peyada	Balu Peyada	Sonakhali	Carp, Tilapia	01719937564
2	Md. Mahbub	Arshed Hawlader	Sonakhali	Carp, Tilapia	01743604054
3	Md. Mosarrof Hossain	Chan Mia	Sonakhali	Carp, Tilapia	01736911657
4	Md. Moklesh	Mohammad Mridha	Sonakhali	Carp, Tilapia	01929268157
5	Md. Sahjahan	Ali Azim Khan	Madhya Sonakhali	Carp, Tilapia	01934438588
6	Md. Oahab	Aziz Fakir	Madhaya Sonakhali	Carp, Tilapia	01729903203
7	Md. Baker Khan	Belaet Khan	Atharogachia	Carp, Tilapia	01713966859
8	Md. Khalilur Rahman	Arshed Pyada	Golbunia	Carp, Tilapia	01929310336

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9	Md. Nur Jamal Hawlader	Kashem Hawlader	Shakharia	Carp, Tilapia	01714729331
10	Sahjahan Mridha	Amjed Ali Mridha	Amragachia	Carp, Tilapia	01716667341
11	Alomgir Mridha	Amjed Ali Mridha	Amragachia	Carp, Tilapia	01726826438
12	Arjan Mollah	Ensan Mollah	Amragachia	Carp, Tilapia	01728873654
13	Ibrahim Mridha	Hasem Mridha	Golbunia	Carp, Tilapia	01727465363
14	Jahir Madbor	Mozibor Madbor	Kewabunia	Carp, Tilapia	01716360560
15	Seral Haque Mridha	Amjed Ali Mridha	Amragachia	Carp, Tilapia	

The nursery owners produce spawns and fingerlings. Generally a capital investment of Tk. 200,000 is required to operate a viable size nursery that produces fingerlings of different species of fishes including Tilapia and carps. The profit margin from fingerlings is about 100%. Generally fingerlings within the size of 1 to 1-1/2 inch are of high demand and can have a sales price of Tk. 1 to 1.5 per piece. Larger size fingerlings will attract a higher price. Every nursery has good linkages with Patilwalas. They receive fingerlings at a reduced price (Tk. 0.20 to 0.50 per fingerlings) but are expected to capture the fingerlings themselves from the pond.

**Patilwala (Fingerling Traders):**

Roughly 30-40 fingerling hawkers/patilwalas are selling fingerling to the farmers of 43/1A. Fingerling hawkers/patilwalas also play a key role in providing information to the farmers on Tilapia farming, though their knowledge is questionable. Hawkers buy from the fry producers in bulk and sell those to the farmers. Sometimes, Hawkers buy fingerling from the lead farmers who stocked GIFT Tilapia and produced fingerlings in their ponds.

**Table 9.3.13 List of fry traders at Polder 43/1A**

Sl #	Name of Fry Trader	Father's Name	Village	Union	Mobile no.
1	Rafiq Fakir	Nizam Uddin Fakir	Paschim Chunakhali	Kukua	01738846780
2	Aziz Musulli	Hamed Musulli	Paschim Chunakhali	Kukua	01789386672
3	Razzak Mridha	Aziz Mridha	Amragachia	Kukua	01934170116
4	Jamal Hawlader	Azhar Hawladr	Amragachia	Kukua	01862687015
5	Jasim Mollah	Sattar Mollah	Amragachia	Kukua	01789530273
6	Hanif Mridha	Sader Ali Mridha	Amragachia	Kukua	01778519685
7	Nasir Mridha	Sundor Ali Mridha	Amragachia	Kukua	
8	Ahsan Mridha	Anech Mridha	Amragachia	Kukua	01731645206
9	Sona Mia	Montaz Uddin Bayati	Amragachia	Kukua	
10	Saidul Mollah	Jabbar Mollah	Amragachia	Kukua	01729390836
11	Jalil Mridha	Anech Mridha	Amragachia	Kukua	
12	Monir Hawlader		Uttar Amragachua	Kukua	
13	Harun Hawladr	Goni Hawladr	Amragachia	Kukua	01728873654 (R)
14	Delwar Hawlader	Goni Hawlader	Amragachia	Kukua	01728873654 (R)
15	Jakir Hossain	Satter Mollah	Amragachia	Kukua	01729390836

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16	Nurul Islam	Sobahan Gazi	Amragachia	Kukua	01788251623
17	Mahbub Mollah	Sahjahan Mollah	Amragachia	Kukua	01754815041
18	Md. Habib	Rustum Pyada	Sonakhali	Atharogachia	01940889535
19	Md. Nasir Uddin	Rustum Pyada	Sonakhali	Atharogachia	01736249458
20	Md. Sona Kha	Kalom Kha	Sonakhali	Atharogachia	
21	Nazrul Islam	Hossen Pyada	Sonakhali	Atharogachia	
22	Nur Alom	Hossen Dacter	Sonakhali	Atharogachia	
23	Barek Pyada	Umer Ali	Sonakhali	Atharogachia	01822808069
24	Md. Liton Dhali	Seraj Dhali	Gazipur	Atharogachia	
25	Afaj Uddin	Jobber Mollah	Gazipur	Atharogachia	
26	Md. Ripon		Gazipur	Atharogachia	0182283854
27	Md. Lavlu	Md. Nunu Gazi	Gazipur	Atharogachia	
28	Jasim	Yasin	Purba Sakharia	Atharogachia	01795813509
29	Monir	Joynal	Purba Sakharia	Atharogachia	01795813509
30	Mizan	Selim	Purba Sakharia	Atharogachia	01944183285
31	Alim	Hanif	Purba Sakharia	Atharogachia	01943219523
32	Alomgir	Hasan	Purba Sakharia	Atharogachia	01937002751
33	Jalal Sikder	After	Golbunia	Atharogachia	01982774137
34	Esmayl Pyada	Razzak	Golbunia	Atharogachia	01677296071
35	Moksedul Hawlder	Hanif	Golbunia	Atharogachia	01918585692
36	Monir	Joynal	Golbunia	Atharogachia	01795814590
37	Monir Sarder	Jabber	Golbunia	Atharogachia	01910773411
38	Bashir	Jabber	Golbunia	Atharogachia	01948992804

On average, each patilwala has an investment of Tk. 2000 (to buy patil mean 'pot') complemented only by physical labour. This investment can last 4/5 years of business. He carries the patil with fingerlings and walks through villages to sell fingerlings to fish farmers. He generally makes a profit of 10% over his investment and labour. In order to maximise his sales he tries to motivate farmers to purchase more fingerlings than necessary by any means even though he sometimes has knowledge (accurate or not) of appropriate stocking densities of each fish species.

#### Input Supply:

Input suppliers are the retailers of the Feed companies and Aqua-chemical companies. They sell essential inputs of fish farming, which include factory made feed, ingredients for homemade feed, different aqua-chemicals and pesticides, to the farmers. These input suppliers are an important channel for the dissemination of information. 12 input traders are doing this business in polder 43/1A.

**Table 9.3.14: Information of some major inputs traders of Fish/Tilapia VC**

SL #	Name of Traders	Mobile No.	Place of Business	Inputs	Collect inputs from	Peak season
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MASTER FILE OF POLDER 43/1A

1.	Sultan Hawlader		Chunakhali Bazer	Uria, TSP, MoP, Pesticides Fungicide	Patuakhali, Amtoli	July to Sep.
2.	Fazlul Haque	01724703679	Chunakhali Bazer	Uria, TSP, MoP, Pesticides Fungicide	Patuakhali Amtoli	Do
3.	Nizamud	01732301629	Mohishkata Bazer	Uria, TSP, Pesticide, Oil Cake, Wheat Bran, Pilate Feed, Lime, Fish Feed	Patuakhali Amtoli	Do
4.	Sultan Master	01718569988	Mohishkata Bazer	Uria, TSP, MoP, Pesticides, Fungicide	Patuakhali Amtoli	Do
5.	Sahanoor Pyada	01736728032	Mohishkata Bazer	Uria, TSP, MoP, Pesticides, Fungicide	Patuakhali Amtoli	Do
6.	Kala Mia Khan	01716106352	Mohishkata Bazer	Fertilizer, Pesticide, Fungicide, Oil Cake, Wheat Bran, Fish Feed, Lime, Mega Fish Feed	Patuakhali Amtoli	Do
7.	Nur Khalek	01721902584	Mohishkata Bazer	Fertilizer, Pesticide, Fungicide, Oil Cake, Wheat Bran, Pilate Feed, Lime, Fish Feed	Patuakhali Amtoli	Do
8.	Khalil Pyada	01929310336	Brick Field Bazer	Fertilizer, Pesticide, Fungicide, Oil Cake, Wheat Bran, Pilate Feed, Lime, Fish Feed	Patuakhali Amtoli	Do
9.	Kasem Bepari	01716993855	Sakharia	Fertilizer, Pesticide, Fungicide, Oil Cake, Wheat Bran, Pilate Feed, Lime, Fish Feed	Patuakhali Amtoli	Do
10.	Md. Sahidul Islam	01719562442	Hajar Takar Badh	Fertilizer, Medicin, Pesticide, Fungicide, Lime, Oil Cake, Wheat Bran, Fish Feed	Amtoli	Do
11	Md. Sanu Hawlader	01729902894	Hajar Takar Badh Bazar	Fertilizer, Pesticide, Fungicide, Oil Cake, Wheat Bran, Pilate Feed, Lime, Medicine for Fish	Amtoli	

12	Md. Moksedur Rahman	01713950816	Junior School Bazar	Uria, TSP, MoP, Pesticides, Fungicide	Amtoli	
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Farmers can purchase inputs like feed and feed ingredients from input traders from nearby markets. Input traders on average make a profit of 20% over sales.

#### **Problems with the supply of brood, quality spawn and nursery management**

Tilapia nurseries/fingerling producers are located both in and outside of the polder area. They lack technical knowhow and management capacity for the production of good quality fingerlings. Farmers can purchase fingerlings directly from these nurseries or from patilwalas (fingerling hawkers). Some fingerlings die if the patilwala carries them in patils for a long time. Patilwalas are motivated by sales volume and profits. They cannot be relied upon to disseminate proper information regarding stocking density for each type of fingerling and mix of culture. Farmers lack proper information about Tilapia culture as a whole. Proper information through training, demonstration, experience sharing and exchange visits can enhance the knowledge level of farmers.

#### **Weak information on the use of feed and other inputs**

Farmers traditionally do not use commercial feed for Tilapia culture. Generally there is also no network of feed input providers. They lack the knowledge regarding the benefits of proper feeding and overall knowledge of pond management. There is no extension service available in the polder providing assistance on the use of feed, health care, pond water examination and remedial actions when a particular problem can be identified.

### **9.3.5 Forward linkages**

#### **Arots**

Arots fulfil the function of a wholesale market place where farmers sell their produce to the paikers and retailers through the arotgars who work on commission. But there is no any arot in the polder 43/1A.

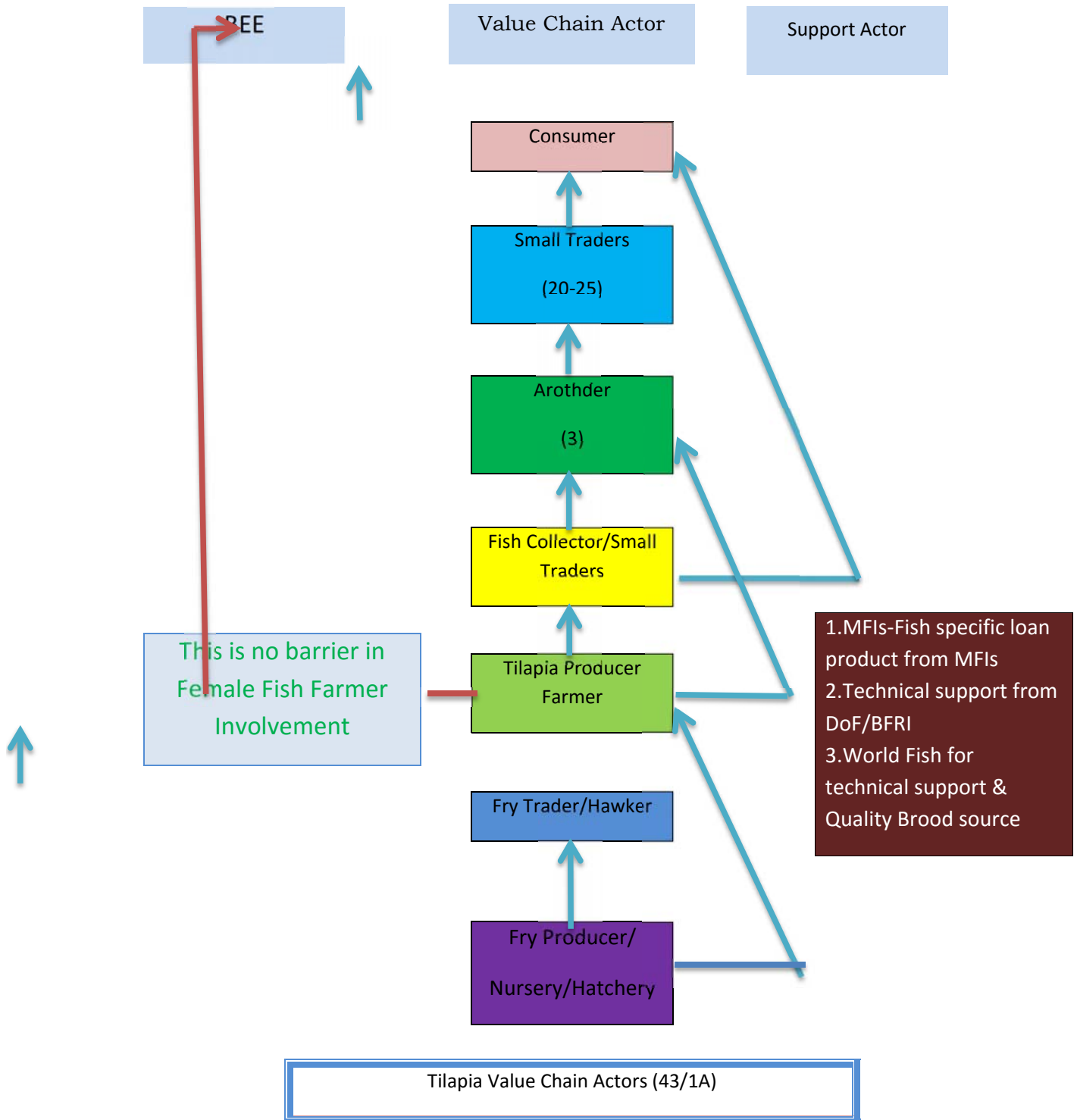
#### **Retailers**

Retailers buy Tilapia from arots/ Paikers and sell it to the end consumers. Although sometimes the retailers purchase direct from farmers.

#### **Limited presence of local trader and arot**

The Tilapia value chain is very short in the polder. Locally produced Tilapia is consumed by the producer himself and by other consumers within the polder. There are small fish traders inside the polder who are local market based. They can easily purchase fish from the farm yard. Farmers can take their produce to these arots for selling but there is no any arot in the polder. Since the demand of Tilapia is very high and fish is imported in the polder to meet the demand, the absence of forward actors seems justified. Only more production can effectively create the need for forward actors who can connect the excess production to regional and national markets. The price variation of Tilapia at different levels was presented in table 4.





### **State Owned Enterprise Involvement – DoF**

The Department of Fisheries (DoF) has a nationwide network of technical experts and extension officials. Beyond the upazilla level, at the small and marginal farmer's level, their service capacity is very limited. Upazila Fisheries officer can be a source of information and technical service provider. But their service is mostly focused in captured fish and for large commercial farmer. Extension service for small house hold level farming is very difficult.

### **Presence of other projects in the region**

There is another USAID supported project in the polder area AIN (Aquaculture for Income and Nutrition), also implemented by World Fish. This project is working to improve variety by supplying good quality brood. World Bank funded Integrated Agricultural Productivity Project (IAPP) is also working in the area for capacity building of producer farmer and providing inputs to improve productivity.

DAE-DANIDA is also implementing a project in the region called Integrated Farm Management Component. It promotes different fish cultures through a few of their specific FFS sessions.

### **Association of Tilapia farmers**

There is no association of fish farmers in polder 43/1A. There are no effective group representations from small scale farmers that can press their demand. There are no support functions that can help farmers with necessary skills to make them entrepreneurs or teach them business skills.

### **Transportation**

Polder 43/1A connected with Patuakhali city and Amtoli Upazila Sadar by road transportation and waterways while its communication with Barguna district head quarter is rather difficult. Different types of vehicles are available for transporting fish to nearby markets. However, patilwalas often walk on foot to market fingerlings. Only sometime they need to use transport like rickshaw van to carry fingerlings from nurseries to fingerling purchasers. On the other hand, Tilapia can be sold from farm gate. Farmers can take excess fish to nearby markets using rickshaw van, or by foot which are within few km. So, transportation is not a big issue.

### **Access to Finance**

There is no any bank branches at the polder 43/1A. 2 post offices inside polders 43/1A, along with many B-Kash centres. Through all of these, cash transactions are possible. In addition, many national, regional and local Micro Finance Institute (MFIs) are operating inside these polders. Usually, a small Tilapia farmer required Tk. 3000-4000 at the time of pond preparation and fingerling stocking. The need of finance for a female farmer can be an obstacle at that particular time as farmers need to invest in T. Aman cultivation. People with limited income can become member of MFIs to obtain credits. However, loan repayment schedule (weekly,

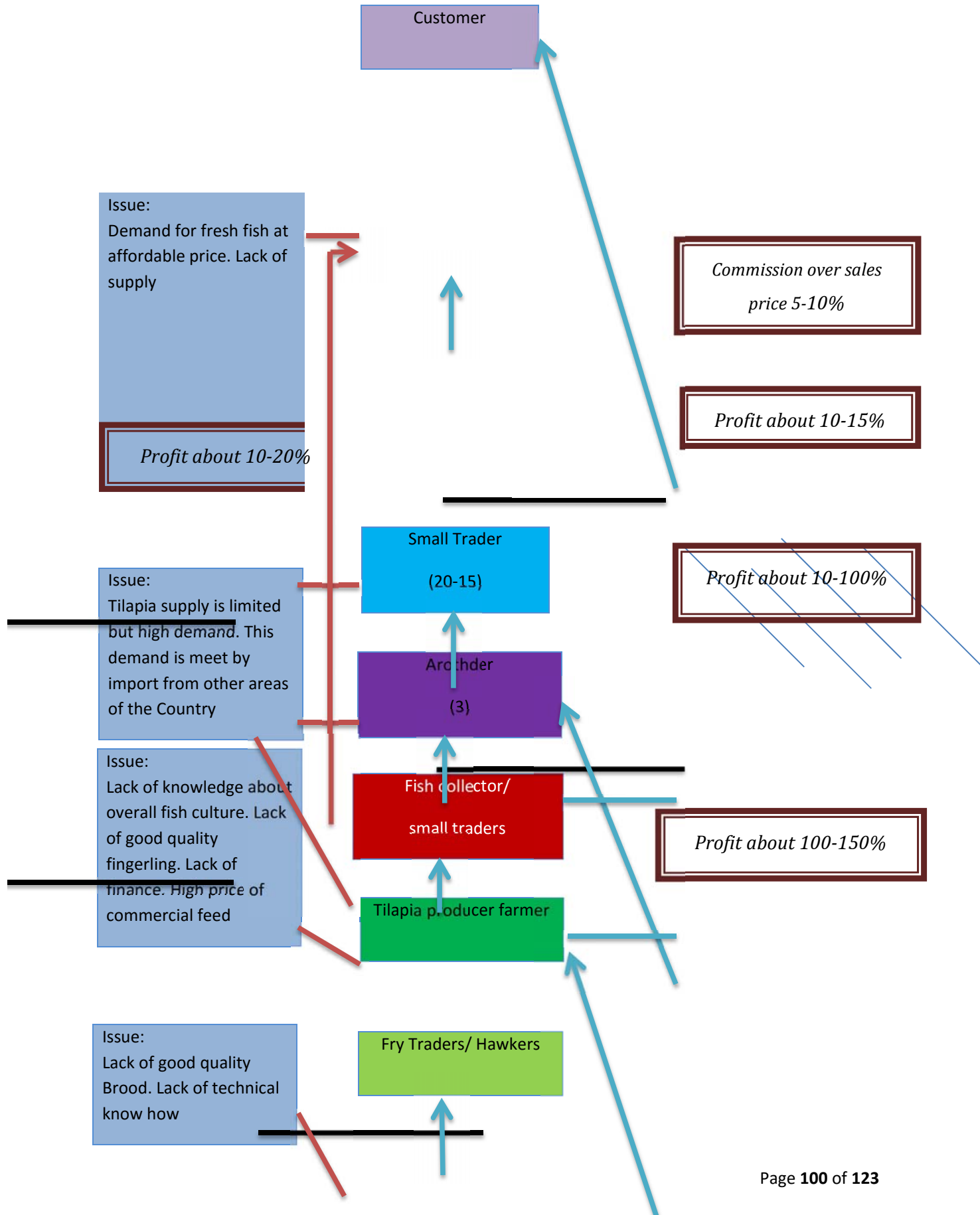
monthly) often is not conducive for small scale fish culture. Thus a fish culture specific loan can be very helpful.

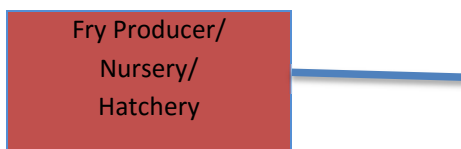
One such option is loan from BCUP. BRAC- BCUP is present in Amtali upazila of the Barguna district. As BCUP's service area extends to 9 km from the BCUP-BRAC office, most farmers of polder 43/1A don't have the opportunity to access its service. Negotiations are on-going with BRAC to enable BCUP loan facilities up to a range of 20 km which would cover virtually all Blue Gold beneficiaries. BCUP offers a very attractive source of finance due to its low interest rate, i.e. 18% reducing (9% effective).

Fish farmers can receive a loan for Tilapia culture from different MFIs and from BCUP by becoming their member.

### **Involvement of Women**

In Tilapia cultivation, women play an important role along with all other family members. A significant contribution from female members can be observed at the time of fingerling purchase, releasing fingerlings to pond, providing feed (mostly house hold residuals) and catching fish by angling for HH consumption. Women are often found to be the investors in small scale Tilapia culture. They often purchase fingerlings from patilwalas at farm gate. Due to a lack of experience and proper knowledge, these women are often misled by patilwalas about the stocking density and ratio. Patilwalas often apply different techniques to push sell their fingerling stock. Women are in great need for training and information on overall fish culture.





**Tilapia value Chain Actors, Functions and Roles**

L.#	Actors	Functions	Roles	Cost / Price/Profit information
1	Consumer	Purchase and consume	Purchase from fish retailers, farm gate	
2	Small trader (Retailer)	Purchase from , arot, preserve, Bulk breaking	Sell to consumers	10-20% profit
3	Arotder	Linkage, purchase on behalf of forward fish trader, arrange transport, ice, financing	Work as commission agent for fish trader. Usually purchase on behalf of producer farmer.	5-10% commission over sales price
4	Fish Collector (Small Trader)	Purchasing Tilapia from farm gate, local arot and retail	Purchase Tilapia from farm gate, transport, invest, preserve, retail.	10-20% profit
5	Producer Farmers	Culture Tilapia	Prepare pond, stock fingerling, provide feed, catch fish for household consumption and sells	Production costs –BDT 6000-8000 per 10dec Selling price depends on size (Tk. 80-120/ kg Normal RoI = 15-20%
6	Patilwala/ Hawker	Fingerling trading	Collects fingerlings from fingerling suppliers and sells to farmers by hawking	10% over investment
7	Fry producer Nursery Hatchery	Fingerling supply	Fingerling production, sales	100% over production cost
8	Input Trader	Input retailing (lime, fertilizer, feed, medicine)	Purchase inputs from companies and retailing. Also trade other types of agri inputs.	10-20% profit (sometime trade commission)

**9.3.6 Preliminary opportunities to increase production of Tilapia**

*Tilapia Value Chain Actors and Constraints (Polder 43/1A)*

### **Opportunities for production increase:**

**Productivity Increase:** Productivity of Tilapia at present is about 40-60 kg per 10 decimal. There is scope of increasing production (Table:3).

**Increasing GIFT culture:** By introducing inbreeding-free GIFT Tilapia household level nutrition and income for female farmer can be increased.

### **Improving culture practices:**

- Proper pond preparation
- Appropriate stocking density and culture mix
- Post stocking management including fertilisation and proper feeding with low cost feed formulation

### **Strengths:**

- Southern region has favourable ecological conditions for Tilapia farming.
- Tilapia culture is possible in any size of ponds which is important as small farmers can cultivate Tilapia in their homestead ponds.
- About 90% of HH have ponds in which Tilapia cultivation is possible and feasible.
- 60-70% ponds of this region are seasonal pond. Tilapia has a short production period (3-4 months) compared to other fish.
- Tilapia can be cultivated with other carp fish which is an added advantage for the farmers.
- Tilapia is famous for its disease resistance, resulting in a guaranteed return on the farmer's investment.
- Tilapia can be cultivated in high density.
- It can be cultivated in multiple cycles in a year which gives farmers more production.
- Productivity of Tilapia is also high compared to the carps.
- High local market demand making it a short value chain.

### **Weakness:**

- Weak linkages amongst the Tilapia value chain actors are prevailing in this area.
- Fry producers and nursery operators have lack of skilled manpower and technical knowhow.
- Quality of the fingerling is questionable due to inbreeding.
- Inadequate supply of quality fingerling of Tilapia in the region which restricted the growth of the sector
- Tilapia production needs relatively high investment and intensive care for commercial production.
- Traditionally the farmers of this region are reluctant to work hard. They rather prefer an easier option like capturing fish from natural sources.
- Farmers lack the appropriate farming knowledge for Tilapia production as the species is relatively new in the region.
- Farmers are reluctant to use supplementary feed.

- Women mostly buy the fingerlings and do so at farm gate from patilwala who might mislead them on practices.

**Opportunities:**

- Tilapia has strong local market demand. Large size Tilapia attracts high price.
- People of almost all income groups buy and consume Tilapia.
- Local production can only meet 10% of the present market demand.
- Feed companies are producing high quality Tilapia floating feed which gives farmers high production.
- Fry producers and other value chain actors are present in the surrounding area and active.
- The demand of Tilapia fry is still unmet in the region which reflects that more farmers are interested to cultivate Tilapia. Fry producers/nurseries have the opportunity to increase business.
- World fish and other development projects are working for the development of Tilapia and aquaculture in this region
- There is a huge gap between present productivity and optimum level of production with available new technologies or practices.
- Linking producer farmers with alternative sources of finance (BCUP) with friendly repayment procedures.

**Threats:**

- This is a disaster prone area and there is a threat for tidal wave during cyclone or abnormal high tide.
- The increasing cost of feed is a serious threat to the production and cultivation of Tilapia which will eventually increase the cost of production of the farmers.

**9.3.7 Constraints, Findings, Problems and Interventions**

**Summary of Constraints and Findings**

About 60-70 percent HH in the polder region has small seasonal ponds. Tilapia culture will not only contribute to improved nutritional uptake but also to generate more income or to serve expense substitution. There are several opportunities to improve Tilapia productivity. Farmers can benefit more by producing Tilapias for domestic consumption and by marketing any large size surplus. So, the Tilapia intervention is aimed at small and marginal households, particularly targeted at female farmers to build their capacity as well as to enhance an income generating opportunity while improving the nutritional uptake at household level.

**Table-10 Area of Constraints its Analysis at a Glance**

<b>Area of Constraint</b>	<b>Findings</b>	<b>Resulting in</b>
Sub-optimal use of finance	<ul style="list-style-type: none"> <li>• extensive production of Tilapia with limited inputs apparently minimises risks</li> <li>• cash flow situation from households generally limits risk taking</li> </ul>	⇒ Low investment into the production resulting in sub-

		optimal productivity and profit.
Sub-optimal culture practices (Technical efficiency)	<ul style="list-style-type: none"> <li>• limited use of commercial feed and fertiliser due to traditional practice may be related with risk aversion</li> <li>• using own and purchased feed of poor quality and of local sources</li> <li>• knowledge gap about quality of fingerling</li> <li>• inappropriate stocking density of fingerling and lack of knowledge about appropriate mix culture (e.g. across different species, at different level of water, feeding, health care)</li> </ul>	⇒ low productivity leading to reduced profitability
Sub-optimal post-harvesting practices (marketing efficiency)	<ul style="list-style-type: none"> <li>• farmers are not involved in producing relatively large size Tilapia with fast growing carp</li> <li>• farmers sell small quantities at farm gate leaving transport to market to others</li> <li>• farmers fail to cooperate and experience a weak position in the market when they sell at farm gate individually</li> </ul>	⇒ lower price and profitability

Small and marginal fish farmers, consider Tilapia as a low investment enterprise. For the production of good quality Tilapia, proper pond preparation and use of appropriate inputs is essential. Requiring investments at a time when there is little cash in the HH, makes access to finance very important for expanding the culture of Tilapia. Since Tilapia is cultured in the monsoon period when T.Aman cultivation is at the peak, the households can be cash starved as they need money for T. Aman cultivation and family maintenance for the next four/five months. Investment funds are required for purchasing fingerlings, feed and other inputs. Thus linking farmers to MFIs and sources of funds is very important. It can also help them to take decisions on the appropriate use of inputs. As a result farmers will be able to overcome their financial barrier and produce more quality Tilapia for HH consumption with possibility to generate income.

Farmers mostly use HH residuals as the only feed for their Tilapia production. They sometimes purchase feed of poor quality or feed that is available locally. The production of feed using local ingredients can overcome this if proper training can be provided to them.

Fish farmers, most of the times catch small size fish for household consumption. Farmers sometimes market small size Tilapia as those did not get larger due to a lack of feed and over stocking. This small size and lean Tilapia reduce their potential income considerably. On the other hand, farmers in the polder usually are not involved in sorting Tilapia according to size as sorting can reduce the sellable quantity without offsetting the benefit from a higher selling price. Nevertheless it is possible for farmers to consume the small size Tilapia and market large size Tilapia that can attract a comparatively better price. A conscious decision among producer farmers on the appropriate culture practices is important.



Farmers can reduce transportation costs if they decide to purchase inputs (lime, fertilizer) together. Different types of transportation are available in polder region. Farmers can avail those to transport to forward market if required.

### Identification of interventions

The table below provides a summary of findings along with problem identification by analysing the findings and planned interventions to overcome the problems.

**Table-11 Identifying Problems and planned Interventions**

	<b>Findings</b>	<b>Problem</b>	<b>Intervention</b>
1.	extensive production of Tilapia with limited inputs apparently minimises risks	None or inappropriate financial products for fish (Tilapia) production in the market	improving the understanding for the need for, planning and using of financing within a household perspective
	cash flow situation from households generally limits risk taking	inadequate understanding of financing (in the household), risks and returns	Improving access to finance in general and to a more appropriate crop financing product in particular.
2	limited use of commercial feed and fertiliser due to traditional practice may be related with risk aversion	lack of appropriate extension or knowledge providers about proper use of feed and fertilizer	Training, pond trials and linking farmers to a network of sources of information (WorldFish, PUST)
	using own and purchased feed of poor quality and of local sources	limited availability of good quality feed at local input providers, so preparing feeds at home	Promote knowledge about improved feed preparation technology and linking farmers to ingredients feed providers and/or organising feed production
	inappropriate stocking density of fingerling and lack of knowledge about appropriate mix culture (e.g. across different species, at different level of water, feeding, health care, medicine dosage, timing, technology)	lack of appropriate knowledge about inputs (fingerlings, feeding), culture mix and overall culture practice as mostly female farmer are involved in purchase of fingerling at farm gate.	Setup pond trials and transfer appropriate information (public, private) and arrange training programme for input providers and farmers on culture
3	farmers are not involved in value adding activities e.g. shorting small vs large fishes when marketing	Lack of knowledge about fish size-price relationship (market demand)	Raise awareness about profit making opportunity by sorting fish (by information sharing, visits etc)

There are no really appropriate financial products for fish production in the market, particularly for the cultivation of Tilapia. There is widespread inadequate understanding of financing at household level. Due to lack of available funds and collective action by the farmers, often fingerlings and other inputs are collected individually in small quantities. Tilapia farmers, particularly female farmers, need financial support to be engaged with proper Tilapia farming. These farmers need to be able to estimate their financial requirement in advance and need to be linked to a funding source, potentially a MFI or BCUP with favourable terms.

To address the issue of finance, an improved understanding about the need for, planning and using of financing within a household perspective is very essential. Farmers need to make understand about enterprise budgeting, record keeping and cost benefit analysis along with the

risks involved of the enterprise. There are no service providers which focus on entrepreneur skills and/or business planning. Improving access to finance in general and to a more appropriate fish financing product for Tilapia culture can help farmers overcome financial barriers.

Stimulated coordination and/or cooperation with respect to input procurement and marketing activities by farmers both individually and as groups has to be pursued through MFS sessions among PG farmers. Resource farmers can take a lead in this.

In the polder the availability of good quality feed is limited at local input provider's level, so formulation and preparation of feed at home could be an alternative option and a source of low price feed supply. Farmers do not have much knowledge about quality of inputs such as fingerlings and feed and of culture practice overall. The extension providers are of limited assistance in this respect.

An MFS can teach farmers about the quality of inputs and help them to link with a local feed producer or teach them to produce feed at home. This should provide the input provider with a better understanding of what inputs he should supply, and what advice he should give to farmers. For this, PFs or even RFs can facilitate 'trust' between retailers and farmers, thereby improving both the retailer's business and the producer's farming. We will seek a 'win-win' situation in this relationship with other stakeholders and establish linkage through market oriented sessions in MFS. In this regard, a survey on farmer's perception of input trader as source of information will be conducted. It is hoped that through MFS activities positive change in perception will take place.

Promoting knowledge about improved feed formulation technology and linking farmers to quality feed providers and/or organising local feed production is absolutely vital to improve Tilapia production in the polder areas. Implementing training, establishing pond trials and linking farmers to a network of sources of information (public, private) can help farmers to close the information gap about improved fish cultures. Setting up of pond trials and transferring appropriate information (public, private) and arrange a training programme for input providers and farmers on cultivation practices can improve expand Tilapia culture. On the other hand farmers can take initiative to sort their produced fish by size both individually or in groups to target a higher market price.

*(Since the overall context of polder 43/1A is almost same to the polder 43/2F and 43/2D. So the main source of this document is the Tilapia Value Chain report developed by Mr. Tanvir Islam Deputy Component Leader, Blue Gold.)*

## **10.0 Product Selection for Value Chain Development**

Polder 43/1A is under Atharogachia and Kukua Union of Amtoli Upaila of Barguna District. It consist of 8 Mauzas and 14 Villages. Total land area of this polder 2675 hecters and Blue Gold benefitad area is 2200 hecters. There are 5425 haouseholds and total population of this polder is 29510. Agriculture is main source of income of this polder duelers. About 60 to 70%

households of this polder is depend on totally Agriculture and 85% households are involved in the sector agriculture. Rice is main crop in the poldr 43/1A and 2<sup>nd</sup> potential crop is Mung Bean, then Mung Bean, then Cowpea and then Water Melon. Beside this farmers are produces some other crops like Chilli, Sweet Potato, Ground Nuts, Falon, Sesame, Sunflower and different types of vegetable. Sunflower is going to be a very potential crop in this area. The farmers’ area showing interest on this as already it shows its potentiality as a cash crop. Fish culturein pond, Poultry and cattle rearing are very common in the polder 43/1A. Almost all households of the polder are rearing native Poultry, Ducks and Cattle in small scale. Commercial farms are very rear in the polder. Beside a little number of Broiler farms no any other commercial farms in the polder. Different types of crops minimize the risk of the farmers. It is found that the main 3 potential products are Mung Bean, Native Poultry and Tilapia to value Chain development in the polder 43/1A.

According to priority list the potential products for value chain development are as follows:

4. Native Poultry
5. Mung Bean
6. Tilapia

Blue Gold Program Matrix for Value Chain Selection Component-04																						Home	
Criteria →	Indicate market level (Local, District, Regional, National, International)	Growth Potential (32)					Impact (32)						Structure of the Industry (15)				Gender & Employment (17)		Collective Action(4)	Risk	Total Weighted Value	Rank	
Crop ↓		Market Size	Unmet market demand	Potential productivity improvements	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 program interests	Involvement of women	Employment generation	Collective Action Opportunities	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%		
<b>Food</b>																							
T Aman	National	5	3	3	0	1	5	5	5	3	3	1	1	3	5	0	1	1	0		2.5	6	
T-Aus		5	3	5	5	1	3	3	1	3	1	1	1	3	5	0	1	1	0		2.4	7	
Cow Pea	National	3	5	3	3	1	3	3	1	3	1	1	5	3	3	1	3	1	5		2.6	5	
Mung bean	National	3	5	5	5	3	3	3	5	3	0	3	5	3	5	3	3	5	5		3.7	2	
Chilli	Regional	1	3	3	3	1	1	1	3	3	1	1	3	1	1	3	3	3	3		2.2	8	
Pea nut	National	1	1	3	3	3	1	1	3	3	1	3	3	1	1	3	1	3	3		2.1	9	
Sweetgourd	District	1	1	3	5	1	1	1	1	1	0	1	1	1	0	0	3	1	1		1.5	12	
Country Bean	District	1	1	1	3	1	1	1	1	1	0	1	1	0	1	1	3	1	1		1.2	11	
Sweet Potato	District	1	1	3	3	5	1	1	1	1	3	1	3	1	3	1	1	1	3		1.9	10	
Water Melon	District	3	3	3	3	3	3	1	3	1	1	3	3	3	3	3	0	5	5		2.7	4	
<b>Aquaculture</b>																							
Tilapia	District	3	3	5	3	5	1	1	5	3	5	5	5	3	5	5	0	1	5		3.3	3	
<b>Livestock</b>																							
Native poultry	Regional	3	5	5	5	1	5	5	5	5	3	5	3	3	5	5	5	5	5		4.3	1	

Fig: Matrix for Value chain selection

## 10.1 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			
<b>Weight level maintain criteria (0-5)</b>	<ul style="list-style-type: none"> <li>• Local, regional, national, or international level of envisaged end-market has been defined,</li> <li>• Consider volume, or value of the market to compare, cereals are usually large volumes &amp; values = 5,</li> <li>• But scavenging eggs are low volume &amp; value in comparison = 1</li> </ul>		
<b>Score 5</b>	<b>Score 3</b>	<b>Score 1</b>	<b>Score 0</b>
T. Aman, T.Aus,	Tilapia, native poultry, Mung bean, Water Melon, Cow Pea	Groundnut, Chili, sweet potato, Sweet Gourd, Country Bean	

**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, Mung Bean, Cow Pea consumption is low. It is not consumed on a regular basis and amount of consumption is very low. Demand of Mung bean is higher to the hindu families, and mainly in the urban areas. Consistency of price is very common although retail price is attractive. Little amount of vegetable is exporting. So, it will score “3”.
- Market size of 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, Sweet Gourd and sweet potato is very small and the value is comparatively low.

2. Unmet market demand (6)			
<b>Weight level maintain criteria (0-5)</b>	<ul style="list-style-type: none"> <li>• Is the demand trend increasing, does the market growth by a high %,</li> <li>• Do you recognize any potential for quick expansion, do buyers clearly seek more than the supply available, than we score this 5,</li> <li>• Markets who only grow on the basis of population growth get 1, and</li> <li>• Market demand that is decreasing, some products get out of our diet or are replaced by substitutes =0</li> </ul>		
<b>Score 5</b>	<b>Score 3</b>	<b>Score 1</b>	<b>Score 0</b>
Cow Pea, Mung bean, native poultry	Tilapia, Water Melon, Chili, T-Aus, T-Amon	Sweet Gourd, Country Bean, Pea nut, sweet potato	

**Key information against the criteria:**

- The demand for Mung bean, Cow Pea 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.
- Cow Pea has huge market demand during Ramadan and in rainy season. Raw material of bakery ingredient Beshon (kind of floor) is Cow Pea. So it has high demand.
- Tilapia have also scope for more expansion. Due to low price, fish has a great demand from the poor.
- Though Water Melon is a very short value Chain but it has high market demand all over the Bangladesh. So many risk associated with the Water Melon cultivation that are unexpected rain, disease and pests.
- Both the T-Amon and T-Aush are the most popular and common crop in Bangladesh. It has huge market demand since the main food of Bangali is rice but in the peak season price of peddy is fall down drastically.

- In case of Sweet Gourd, Country Bean, Pea nut and sweet potato 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. Potential Productivity Improvement (6)			
<b>Weight level maintain criteria (0-5)</b>	<ul style="list-style-type: none"> <li>• Do we know of accessible technological (broad sense) improvements?</li> <li>• If no potential to improve productivity, score =0,</li> <li>• Very limited potential (&lt;10%)=1,</li> <li>• Medium potential(10-19%) = 3,</li> <li>• High potential to increase productivity (<math>\geq 20\%</math>)=5</li> </ul>		
<b>Score 5</b>	<b>Score 3</b>	<b>Score 1</b>	<b>Score 0</b>
Mung bean, native poultry, Tilapia, T-Aus	Water Melon, chili, Sweet Gourd, Cow Pea, T-Amon, sweet potato, Pea nut	Country Bean	

**Key information against the criteria:**

- Considering present productivity of different products in the polder 43/1A this scoring has been done. Productivity of Mung bean, native poultry, T-Aus 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 Water Melon, chilli, Sweet Gourd, Cow Pea, sweet potato, Pea nuts and T-Amon in the polder 43/1A is very low. Improving input utilization will increase production. So, it has been scored “3” to this group.
- Country Bean has limited scope for production increase. So it scored “1”

4. Expansion of areas/capacity (7)			
<b>Weight level maintain criteria (0-5)</b>	<ul style="list-style-type: none"> <li>• If no scope to expand, e.g. T. Amman rice score =0,</li> <li>• very limited scope (&lt;10%) =1</li> <li>• Medium scope (10-20%)= 3</li> <li>• High potential (<math>\geq 20\%</math>) e.g. winter crops where cropping intensity is still very low due to infrastructure constraints=5</li> </ul>		
<b>Score 5</b>	<b>Score 3</b>	<b>Score 1</b>	<b>Score 0</b>
T-Aus, Mung bean, Sweet Gourd, native poultry	Tilapia, chili, Cow Pea, sweet potato, Pea nut, Country Bean, Water Melon		T. Aman

**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. In late winter a huge land area remain fallow. So there is a scope for expansion of area of Sweet Gourd cultivation more that 200%. As a kharip-1 crop T-Aus covered very little areas and most of the land of polder 43/1A is remain fellow. So there is a scope to increase the area of T-Aus cultivation more than 300%.
- Considering the present involvement of HHs, the scope for expansion for Tilapia, chili, Cow Pea, sweet potato, Pea nut, Country Bean, Water Melon is little lower than Mung bean, native poultry.
- As almost 100% land is under cultivation of T. Aman and, there is no scope for area expansion.

5. Value Adding to raw materials (6)	
<b>Weight level maintain criteria (0-5)</b>	<ul style="list-style-type: none"> <li>• The potential for farmers or small or micro enterprises to add value and increase earnings locally would score 5,</li> </ul>

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	<ul style="list-style-type: none"> <li>If it requires a much larger investment by a processor at regional level =3 or even 1</li> <li>When technically there is no value addition possible =0</li> <li>If no value addition possible, score =0, very limited chance =1 (&lt;10%), Medium potential (10-19%)= 3, High potential (≥20%)=5</li> </ul>		
<b>Score 5</b>	<b>Score 3</b>	<b>Score 1</b>	<b>Score 0</b>
Tilapia, Sweet Potato	Mung bean, Pea Nut, Water Melon	Native poultry, Country Bean, Sweet Gourd, chili, Cow Pea, T. Aman, T.Aus	

**Key information against the criteria:**

- In case of Tilapia local level value adding scope is much higher. There is a high scope to value add in Sweet Potato by produce different types of Chips.
- The price of Mung bean differs upon its pod size and moisture content. So, local level value adding is possible by grading and processing. Pea Nuts can be used to produce different types of cakes and snacks. It is easy to produce water melon juice.
- In case of Native poultry, Country Bean, Sweet Gourd, chili, Cow Pea, 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)**

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

1. Current production(5)			
<b>Weight level maintain criteria (0-5)</b>	<ul style="list-style-type: none"> <li>The % of the land presently under cultivation of this crop, or</li> <li>The present scale (scavenging versus large broiler farms) or volume of production sets the foundation for the level of impact that can be expected.</li> <li>T. Aman is produced on nearly 100% of the area available =5</li> <li>A crop that only commands a very small percentage of the area =1 and</li> <li>A crop that still needs to be introduced =0, If a crop is produced on say around 50% of land then score=3</li> </ul>		
<b>Score 5</b>	<b>Score 3</b>	<b>Score 1</b>	<b>Score 0</b>
T. Aman, native poultry	Mung bean, T.Aus, Cow Pea, Water Melon	Tilapia, chili, Cow Pea, Pea Nut, Sweet Gourd, Country Bean, sweet potato	

**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, Cow Pea, Water Melon and T.Aus is moderate and low compared to the T.Aman.
- But Tilapia, chili, Cow Pea, Pea Nut, Sweet Gourd, Country Bean, sweet potato is cultivated in smaller area compared to other two categories.

2. Number of households involved(5)	
<b>Weight level maintain criteria (0-5)</b>	<ul style="list-style-type: none"> <li>If less than &lt;5% HH Involved, score =0</li> <li>Involvement by (5-20%) =1</li> </ul>

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	<ul style="list-style-type: none"> <li>• By (20-60%)= 3</li> <li>• High potential (&gt;60%)=5 (explanations are similar as above)</li> </ul>		
<b>Score 5</b>	<b>Score 3</b>	<b>Score 1</b>	<b>Score 0</b>
Native poultry, T. Aman	Mung bean, Cow Pea, T.Aus	Chili, Pea Nut, Sweet Gourd, Country Bean, Water Melon, Tilapia, sweet potato	

**Key information against the criteria:**

- About 100% HHs involved with T. Aman cultivation and 75% with poultry rearing.
- Mung bean, Cow Pea, and T.Aus cultivated by 30-50% HHs.
- Chili, Pea Nut, Sweet Gourd, Country Bean, Water Melon, Tilapia, sweet potato are covered by below 20% HHs.

<b>3. Contribution to HH income and wealth(6)</b>			
<b>Weight level maintain criteria (0-5)</b>	<ul style="list-style-type: none"> <li>• Consider the present versus potential contribution to HH income (contribution to yearly income as %)</li> <li>• Score =0 (only loss making produce)</li> <li>• Very limited potential to contribution (&gt;5%) =1 (a produce which will always be low in volume, and value despite productivity improvements)</li> <li>• Medium potential (6-25%)= 3</li> <li>• High potential (&gt;25%)=5</li> </ul>		
<b>Score 5</b>	<b>Score 3</b>	<b>Score 1</b>	<b>Score 0</b>
T-Amon, Mung bean, Tilapia, Native poultry	Peanut, chili, Water Melon	T.Aus, Cow Pea, Sweet Gourd, Country Bean, Sweet Potato	

**Key information against the criteria:**

- T-Amon, Mung bean, Tilapia and Native poultry have very high potential to contribute 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 Peanut, chili and Water Melon there is medium potential to increase production as well as contribution to HH income. 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%.
- In case of T.Aus, Cow Pea, Sweet Gourd, Country Bean and Sweet Potato there is minimal contribution to HH income.

<b>4. Short or longer production/harvesting season(5)</b>			
<b>Weight level maintain criteria (0-5)</b>	<p>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</p>		
<b>Score 5</b>	<b>Score 3</b>	<b>Score 1</b>	<b>Score 0</b>
Native poultry	T. Aman, T.Aus, Cow Pea, Mung Bean, Chili, Pea Nut, Tilapia	Sweet Gourd, Country Bean, Sweet Potato, Water Melon	

**Key information against the criteria:**

- Native poultry has year round production with regular income. Moreover, poultry is not perishable. Considering the both criteria we score it "5".
- T. Aman, T.Aus, Cow Pea, Mung Bean, Chili, Pea Nut, Tilapia have short harvesting period but they are not perishable. Considering these points score for these three products will get "3".
- Harvesting period of Sweet Gourd, Country Bean, Sweet Potato and Water Melon are short and they are also perishable. In this case they will get "1".

5. Food Security(6)			
<b>Weight level maintain criteria (0-5)</b>	<ul style="list-style-type: none"> <li>• If no impact on food security as non-food product score =0,</li> <li>• A food product already being produced locally in surplus has very limited impact opportunity =1</li> <li>• Medium potential for impact= 3</li> <li>• A food crop which regularly has to be imported to maintain food security in the area, has high potential to impact=5</li> </ul>		
<b>Score 5</b>	<b>Score 3</b>	<b>Score 1</b>	<b>Score 0</b>
Tilapia	T-Amon, Sweet Potato, Native Poultry	T.Aus, Cow Pea, Chili, Pea nut, Water Melon	Mung bean, Sweet Gourd, Country Bean

**Key information against the criteria:**

- 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.Aus is the main food item for the people but it has minimal contribution to food. So, it will result in very little impact. On the other hand Cow Pea, Chili, Pea nut, Water Melon 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 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. T-Amon and Sweet Potato have high contribution to HH food requirement but these have low nutritious value.
- 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)			
<b>Weight level maintain criteria (0-5)</b>	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.		
<b>Score 5</b>	<b>Score 3</b>	<b>Score 1</b>	<b>Score 0</b>
Native poultry, Tilapia	Pea nut, Mung bean, Water Melon	Cow Pea, Chili, Sweet Gourd, Country Bean, sweet potato, T. Aman, T.Aus	

**Key information against the criteria:**

- 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 Cow Pea 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. Chili contains vitamin C which is very essential and one needs a regular supply as the body can't store the excess Vit-C and Sweet Gourd and Country Bean are using as vegetale. So these scored "1"
- 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.
- 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)

<b>1. Forward / backward linkages market development approach(5)</b>
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<b>Weight level maintain criteria (0-5)</b>	<ul style="list-style-type: none"> <li>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.</li> <li>Due to complete absence score =0</li> <li>Very limited potential =1</li> <li>Medium potential = 3</li> <li>High potential =5</li> </ul>		
<b>Score 5</b>	<b>Score 3</b>	<b>Score 1</b>	<b>Score 0</b>
Mung bean, Cow Pea, Tilapia,	Native poultry, chili, Pea Nut, Sweet Potato, Water Melon	T. Aman, T.Aus, Sweet Gourd, Country Bean	

**Key information against the criteria:**

- There is processing industry that processes and trades Mungbeans and Cow Pea at Barisal. Market actors are available and proactive. BARI has developed different HYV and DAE is disseminating the technology of Mung Bean. All inputs are available and service quality is fairly good. Only problem is accessibility where there is scope for development.
- There are 4 Tilapia hatcheries and 1 fish processing centers in this region. 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, Pea Nut, Sweet Potato, Water Melon 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 T. Aman and T.Aus, Sweet Gourd and Country Bean 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.

<b>2. Existence of service providers(4)</b>			
<b>Weight level maintain criteria (0-5)</b>	<ul style="list-style-type: none"> <li>Similar to above, existence and performance of public and private service providers to the value chain actors. If no existence for SP, score =0</li> <li>Very limited presence (1/2) =1</li> <li>Medium presence (2-5)= 3</li> <li>High existence (&gt;5) =5</li> </ul>		
<b>Score 5</b>	<b>Score 3</b>	<b>Score 1</b>	<b>Score 0</b>
	Cow Pea, Mung bean, T. Aman, T.Aus, Water Melon, Tilapia, Natuve Poultry	Chili, Pea Nut, Sweet Gourd, Sweet Potato	Country Bean

**Key information against the criteria:**

- For Cow Pea, Mung bean, T. Aman, T.Aus, Water Melon, Tilapia, Natuve Poultry 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 Chili, Pea Nut, Sweet Gourd, Sweet Potato. Existence and performance of private service is also weak compared to the above one.
- Poler duellars are traditionally cultivating the Cuntry Bean and it require minimal extention service.

<b>3. Favorable business environment(4)</b>			
<b>Weight level maintain criteria (0-5)</b>	<ul style="list-style-type: none"> <li>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.</li> <li>If business environment is obstructive in several ways score =0,</li> <li>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.</li> </ul>		
<b>Score 5</b>	<b>Score 3</b>	<b>Score 1</b>	<b>Score 0</b>

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T. Aman, T.Aus, Mung bean, Native poultry, Tilapia	Cow Pea, Water Melon, Sweet Potato	Chili, Pea Nut, Country Bean,	Sweet Gourd
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**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”.
- DAE is supporting farmers involved Cow Pea, Water Melon and Sweet Potato cultivation.
- But for Pea Nut and Country Bean, there is no special program of emphasis or subsidy.
- Sweet Gourd is being consumed by the local people.

4. Other program interests(2)			
<b>Weight level maintain criteria (0-5)</b>	<ul style="list-style-type: none"> <li>• The extent there is opportunities for coordination, complementary action and synergy with other local program.</li> <li>• If no NGO/Org working in the same sector, score =0</li> <li>• Very limited presence (1-2) =1</li> <li>• Medium presence (3-5)= 3</li> <li>• High presence (&gt;5)=5</li> </ul>		
<b>Score 5</b>	<b>Score 3</b>	<b>Score 1</b>	<b>Score 0</b>
Native poultry, Tilapia	Mung bean, Chili, Pea Nut, Water Melon	Cow Pea, Country Bean, Sweet Potato	T. Aman, T.Aus, Sweet Gourd

**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.
- Other programs are not exclusively with Mung bean, chili, Groundnut, or Water Melon. 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 Cow Pea and sweet potato. Development programs don't have any program to Country Bean cultivation
- For paddy and Sweer Gourd 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)			
<b>Weight level maintain criteria (0-5)</b>	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		
<b>Score 5</b>	<b>Score 3</b>	<b>Score 1</b>	<b>Score 0</b>

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Native poultry	Cow Pea, Mung bean, chili, Sweet Gourd, Country Bean	T. Aman, T.Aus, Pea Nut, Sweet Potato	Tilapia, Water Melon
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**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 Cow Pea, Mung bean and chili. They also fully involved in Sweet Gourd and Country Bean cultivation. These create employment opportunity for women. But this opportunity is for a short time and constitutes little more than extra work.
- Women are involved in one or more stages T. Aman, T.Aus, Pea Nut, Sweet Potato and paddy from cultivation to harvesting. But the service is generally unpaid family labor.
- In case of Tilapia and Water Melon women have no involvement.

2. Employment generation(8)			
<b>Weight level maintain criteria (0-5)</b>	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		
<b>Score 5</b>	<b>Score 3</b>	<b>Score 1</b>	<b>Score 0</b>
Native poultry, Mung bean, Water Melon	Chili, Pea nut	T. Aman, T.Aus, Cow Pea, Sweet Gourd, Country Bean, Sweet Potato	

**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 and Water Melon has potential for area and productivity increase. In that case it will facilitate extra 50-70% labor during harvesting.
- Groundnut & Chili 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 T. Aman, T.Aus, Cow Pea, Sweet Gourd, Country Bean and Sweet Potato may create an opportunity for mainly labor employment at a minimum level.

E. Collective action opportunities (4)			
1. Collective action opportunities(4)			
<b>Weight level maintain criteria (0-5)</b>	<ul style="list-style-type: none"> <li>• Does this product lend itself to Business ideas for cooperatives, on the input or market side, and producer groups benefitting of doing these collectively.</li> <li>• If no opportunities for collective action (working in collaboration/ as cooperatives), score =0</li> <li>• Very limited potential =1</li> <li>• Medium potential = 3</li> <li>• High potential =5</li> </ul>		
<b>Score 5</b>	<b>Score 3</b>	<b>Score 1</b>	<b>Score 0</b>
Cow Pea, Mung Bean, Water Melon, Native poultry, Tilapia	Chili, Pea Nut, Sweet Potato,	Sweet Gourd, Country Bean	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, Cow Pea, Mung Bean and Water Melon as most farmers are small producers. Considering these possibilities there are better opportunities for collective action.

- In case of Chili, Pea Nut and Sweet Potato 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 Sweet Gourd and Country Bean 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)			
<b>Weight level maintain criteria (0-5)</b>	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.		
<b>Level of risk</b>			
	Native poultry, Tilapia	Mung bean, Chili, Sweet gourd, Pea nut, Country bean, Sweet Potato, Water Melon	

**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 Chunakhali Bazer or farm gate, some farmers at Patuakhali or Amtoli.
- Also opportunity to sale Mung bean, Chili collectively.

**11. SWOT analysis of Polder 43/1A**

**Strength**

**Natural Resource**

- 3500 ha cultivable fertile land with low salinity intuition in some area specially in dry season
- Enough or sufficient fresh water surrounding the polder which facilitate crop production
- 70% HH have pond (217 hac), 99% have Homestead area
- Out fall rivers are active and blessed by river Payra
- Canal length is 110 km in the polder which is the source of irrigation and also can be used for community aquaculture
- 80% medium high land is potential for crop production

### **Infrastructure**

- About 33 km embankment which is fairly good with 38 irrigation inlets, 3 outlet and 16 sluices.
- condition, structures are also fairly good
- Road density is 25m/ha (paka-15 km, kacha-90km) enhance connectivity
- As main two roads have gone through southern part, this part is economically strong than northern
- School, Madrasha, College, cyclone center, UP office are the major establishments

### **Technical Production**

- FFS & FLS are facilitating agriculture production
- Agricultural machineries are available, as 16 WMG got agri- machines from FAO.
- About 100% farmers produce T. Aman
- Farmer are involved with some cash crop production, like-  
Crop: Mungbean, sesame (till), chili, betel leaf, keshari, pea nut, banana etc.  
Livestock: native poultry, duck and pigeon.  
Fisheries: common carp and captured fish
- 8% farmers are surplus farmer and 20% have no deficit.
- 75% HH rear poultry, 22% HH rear goat or sheep and 41% HH rear large ruminant (cattle & buffalo)
- 58.5% HH have ponds or ditches.

### **Human Resource**

- Presence of multi-sector people where, main profession of 42.4% is agriculture, 9.8% ag-labour, 10% non-ag labour, 10.6% business, 12% service.
- There are different trained members in the WMGs (organizational management, leadership)
- Almost all the farmers have lifelong experience on agriculture (40%)
- 44% Non agriculture labour exist in the polder
- Different service providers are present (paravet, poultry worker, fish traders, mechanics)

### **Social & Gender**

- Women participation in meeting and different economic activities is encouraging

- There is no major social or religious conflict
- 300 women are working in LCS groups,
- 39% women are in EC of WMG

### **Institutional**

- UP office, sub register office, branch office of different MFI (micro finance institute) is providing service for the polder people.
- There are 27 WMGs, 16 WMC and 1 WMA who are managing water infrastructure as well as gradually progressing toward IGA development

### **Economic & Commercial**

- WMGs have savings to invest (0.8 million taka). Presently 2,27,700 taka in inrolling in different IGA, 5,22,280 taka deposit in banks.
- WMGs are involve with infrastructure development through LCS (labour contracting society)
- 16 WMGs have got agriculture machineries from FAO which is a source of income and economic activities.
- 10.6% HH are involved with different business and 12% is providing service, like-paravet, mechanics etc.
- 80% HH are in mobile coverage
- There are some small food processing units, biscuit factory, chanachur factory, hotel
- Presently there are two brick field in this polder which is creating employment
- There are six market in this polder.  
Product out flow: paddy, betel leaf, Mungbean, keshari, till, fish (mainly captured).  
Product in flow: vegetable, commodities, tilapia, pangus, fingerling, seedling and sapling
- There are about 6-8 input retailers in this polder. Besides, different mobile input retailers come in market day.
- There is cheap and good water communication facilities
- 15 Km pacca road and 90 Km kacha road with 24.5 m/ha road density is furnishing the communication system.
- 80% HHs are under mobile communication
- There is about 10 B-cask agent in the polder
- 5% HHs are under power supply and 1-2% are under electricity coverage.

- Presence of different market actors (nursery owners, Bapari, wholesaler ...)

## Weaknesses

### Natural Resource

- Erosion at 4 villages makes the polder vulnerable.

### Human Resource

- 71% of HH fall under marginal & vulnerable group
- Lack of knowledge about IPM

### Infrastructures

- Local drainage congestion/ delayed drainage at Karamjabunia, North and West Kalagachhia, Moth-baria and Kalibari, requiring new outlets.
- Some khals got silted up, that slows down drainage flow.
- Several villages still suffer from shortage of irrigation water, which need some additional new inlets.
- Lack of proper O&M
- Few cyclone shelters
- Lack of Killa(for livestock)
- 80% of WMG can not organize meeting due to lack of WMG office
- Poor condition of some sluice gates (leads to water logging)
- Some inlets are not working properly
- Shortage of outlets
- Siltation of some khals

### Technical Production

- Lack of quality 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
- No hatchery and quality fingerlings
- Non availability of HYV seed
- Early drainage limit fish production

### **Social and Gender**

- Infrastructures are controlled by influential people
- Due to social stigma, 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
- 

## **Opportunities**

### **Natural resources:**

- Outfall rivers are mostly non-saline throughout the year (Payra River is slightly saline during March-April).
- Surrounding rivers of this polder can be a blessing
- Coastal forestation program will help to conserve the natural resource



**Infrastructure:**

- Construction of 1 new sluice & 5 new outlets will significantly reduce drainage congestion during monsoon and post monsoon (BP: All Farmers).
- Construction of about 13 new irrigation inlets will significantly improve irrigation facilities in areas presently suffering from water stress (BP: All Farmers).
- Re-excavation of 12 khals will improve drainage as well as irrigation facilities (for aman seedling & aman) in the polder (BP: All Farmers i/c LCS).
- Re-sectioning of embankment and repair of structures will greatly improve safety of the polder

**Technical production:**

- No shrimp area and hence no shrimp vs. crop agriculture conflict in this costal area.
- Unused and backyard land can be used for Agricultural Production.
- Water body can use by case and pen culture
- Fodder crop cultivation
- 50% land remain fallow in the winter season which can be come under production
- Demonstration involving low head pumps to cultivate distant fields.
- Establish livestock vaccine cold chain for vaccination services at WMG/WMA level
- Introducing production related activities through FFS

**Human Resources:**

- Seasonal migration is common in this polder. Migrated people may return with improve skill and idea.
- Surrounding the polder there are many skill persons who have ability to provide quality service
- Involvement of different professionals from Blue Gold Program and other different programs

**Social and gender issues:**

- Presence of different sensitive programs
- Mandate of Govt. for women empowerment
- LCS is providing opportunity for women empowerment

- Women access to market

**Institutional:**

- UP can explore different problems to the proper authority to provide a balance socio-economic condition in the polder
- Linkage building of the WMGs with different external actors
- Strengthening of linkage with govt line department at upazila level will enhance extension of service

**Economic and commercial :**

- Presence of different industry in this region, like- fish processing centre (nirala at Patuakhali), fish hatcheries (Bay of Bangal at Barguna), food processing centre (Amrita at Barisal) etc.
- Road connectivity for Patuakhali and Amtoli and infrastructure development (different bridges under construction)
- Presence of different large market actors in upazila and district level.
- Easy water communication through river Payra.
- Simultaneous development of other polder will enhance regional economy.

**Threats**

**Natural resources:** Cyclone, Siltation,

**Human resources:** Cyclone, Out migration,

**Infrastructures:** Cyclone, Lack of river training, Bad road communication increasing cost of production

**Technical production:** Drought, Over rainfall, Sudden outbreak of disease and pest, Outmigration, Malpractice of adulteration, Market distortion, low quality of inputs and services

**Social& gender:** Cyclone, different relief and asset transfer project or program, Conservativeness, religious influences/misinterpretation of religious thought

**Institutional:** Limitations of budget for construction work, sudden change in Govt. Policy (BWBD gazette), different relief and asset transfer project or program, political unrest, Out migration,

**Economical & Commercial:** Cyclone, Limitations of budget, Political unrest, syndicates control the market