



Water Governance and Community Based Water Management

Situation Analysis Report Polder Jainkathi LGED Sub Project, Patuakhali Sadar Upazila, Patuakhali

Mustafa Bakuluzzaman
Research Coordinator
Shushilan
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1. INTRODUCTION

1.1. Aim of the report

Based on Focus Group Discussions and Key Informant Interviews, this report aims to create a detailed situation analysis of polder Jainkathi Sub Project in Patuakhali district. It will do so by providing:

- i) A historical narrative of the polder from the time it was constructed to present;
- ii) Farming systems and livelihoods options;
- iii) Current state of the polder infrastructure;
- iv) Examining the results and process of the water management intervention by the LGED
- v) Reviewing how maintenance of water infrastructure takes place;
- vi) Reviewing how operation of sluice gates take place and
- vii) Discussing main conflicts.

It will then conclude by discussing the main findings and implementable policy recommendations that came from the respondents for improving water management in the Polder called Bagirabad, Jainkathi Sub Project of the LGED.

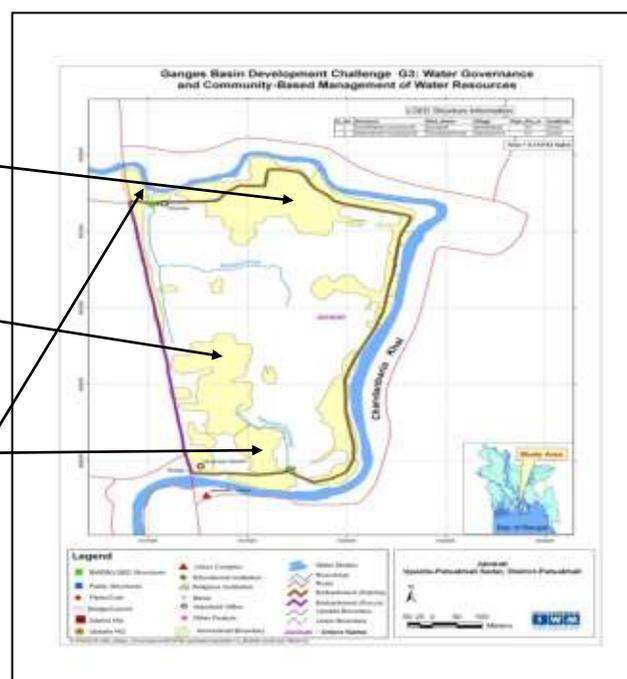
1.2. Methodology

Four Focus Group Discussions and eight Key Informant Interviews (KIIs) were conducted by the Shushilan research team from 8th to 10th April, 2012. While the FGDs were held in four sub villages (para) of village Bagirabad, the KIIs with farmers were held at their village home and the KIIs with officials were held at the respective offices in the UP and Upazila headquarters.

The map below describes where the FGDs have been conducted. The FGD locations and participants were selected to represent various parts of the village, distance from the sluice gates, the gate condition and concentration of various types of farming, particularly paddy and betel leaves cultivation.

Location of the FGDs

| S L # | Group Name | Location | Concerned Gate | Canals |
|-------|---------------|---|---|--|
| 1 | General Group | North para, Northeast side of the polder | Shorifbari (open) | Chandanbaria (open), Kalibari (open) |
| 2 | LCS Female | Moddhya para (Middle part of the polder) | Shorifbari (open) and Talukdarbari (closed) | Chandanbaria (open), Kalibari (open) and Talukdarbari (closed) |
| 3 | General Group | South para (Southwest side of the polder) | Talukdarbari (closed) | Chandanbaria (open) and Talukdarbari (closed) |
| 4 | WMCA | Bagirabad, Jainkathi | Sharifbari (open) and Talukdarbari (closed) | Chandanbaria (open), Kalibari (open) and Talukdarbari (closed) |



A glance look of the FGD participants reveals the following:

- The general FGD groups met at North para (Northeast part of the village) had seven participants including 5 women. All own land one to two acres. One man and all women are Hindus. Age 24-57. Of the two men one is crop as well as fish farmer and the other is a tailor. All women are “housewife”. All seven are “WMCA members”.
- The general FGD group met at South para had 11 participants, all Hindus. It had 5 women and all 5 are landless. Of the six men, one is a landless, others own land between 1.0 to 10.0 acres. Of the six men 4 are farmers, one mason and one handicraft producer. All five women are “housewife” and all 11 are “WMCA members”. Age varied from 30 to 80!
- The WMCA FGD had eight participants including 2 women. All eight are WMCA members. Of the six men, one is a teacher and another one is a rural medical practitioner (village doctor). The other four are farmers. All own land from 0.30 to 10.00 acres. The women are “housewife”. Age varied from 42 to 90!
- The LCS group met comprises five landless women of age 18-55. All stated to be “housewife” although they work in the LCS.

The list of FGD and KII is provided in Table 1 and 2.

Table 1: List of FGDs conducted at Jainkathi sub project polder

| SL # | FGD Type | Numbers of Participants (Female) | Village & UP | Relevant Sluice Gate Numbers |
|------|----------|----------------------------------|----------------------|------------------------------|
| 1 | General | 7 (5) | Bagirabad, Jainkathi | 01, 02 |
| 2 | General | 11(5) | Bagirabad, Jainkathi | 01, 02 |
| 3 | LCS | 5 (5) | Bagirabad, Jainkathi | 01, 02 |
| 4 | WMCA | 8 (2) | Bagirabad, Jainkathi | 01, 02 |

Table 2: List of KII conducted in Jainkathi Sub Project polder

| Sl # | Respondent Type | Village/ Venue | Date |
|------|----------------------|----------------|------------|
| 1 | UP Chairman | Bagirabad | 08.04.2012 |
| 2 | UP member | Bagirabad | 08.04.2012 |
| 3 | Paddy farmer | Bagirabad | 09.04.2012 |
| 4 | WMCA-president | Bagirabad | 09.04.2012 |
| 5 | WMCA-women member | Bagirabad | 09.04.2012 |
| 6 | Woman household head | Bagirabad | 09.04.2012 |
| 7 | Landless | Bagirabad | 09.04.2012 |
| 8 | CO-LGED | Bagirabad | 10.04.2012 |

1.3. Overview of Jainkathi Sub Project Area

1.31. Location and accessibility

Location

The Jainkathi Sub Project polder of LGED is located at Bagirabad village in Jainkathi UP of Sadar Upazila in Patuakhali district. The polder area is surrounded by the Chandanbaria canal in the north, east and south while the western boundary is formed by Jainkathi Patuakhali road. The polder area has one village, Bagirabad. The adjoining village in the south is Shehakathi of the same UP.

Geographical characteristics

The land in the beel area was regularly inundated by tide when it was not regulated by embankment and sluice gates. Presently, after constructing the embankment by the LGED, it is not inundated by tide water but it faces drainage problem, because one gate in the south is closed and the canal blocked by the adjoining landowners.

About one third of the polder is relatively high land and the high lands almost surround the river, particularly from the northwest through east to southwest. The yellow colored high land area accommodates the homesteads and betel leaves plantation. The homestead area and the road sides are full of trees, hence looks very green. The soil is clay loam type in the middle and loam type in the peripheral high lands. The extreme northwest and south have two canals draining water from the lower middle part to the Chandanbaria khal. Since the Talukdarbari gate is closed, the polder has now only one drainage outlet and irrigation inlet, the Shorif bari or Kalibari (same) gate.

The southern and eastern part is elevated and the land slopes towards northwest. Hence the Shorifbari gate can serve the need of drainage purpose to a great extent (not fully) but it cannot provide water for irrigation to all areas, particularly the southeast part remains un-served.

Accessibility

The sub project area is located six kms south of Patuakhali town. It is connected to the town by a paved road from Jainkathi UP office to the southeast corner of the town. This is the only paved road from the polder area located in the western boundary. The LGED embankment along the Chandanbaria canal serves as an internal unpaved road.

In the past, people used country boat and motor launch service to go to the town but now, because of road development, waterway is rarely used for this short distance. However, people still use motor launch service for longer travel to Dhaka or to nearby Upazila, Golachipa. Boats are still used for going to markets like Kalagacia in the southeast, 10 kms downstream on river Lohalia. Nearest motor launch stations are Shehakathi 2 kms southeast and Patuakhali, 6 kms north. Nearest bus station is nine kms north in Patuakhali town.

Most frequent mode of transport is rickshaw, rickshaw van and three wheeler battery operated auto rickshaw. Bus service and motor launch service are availed after arriving Patuakhali town.

1.3.2. Demographic features

Table 3 below provides basic demographic features of the Bagirabad Jainkathi Sub Project polder. The polder has just one village surrounded by it, Bagirabad of Jainkathi UP. The

adjoining village in the south is Shehakathi of the same UP. The Table 3 provides information of village Bagirabad which is the polder area. Information of Jainkathi UP and Patuakhali Sadar Upazila of which Bagirabad is a part is provided for comparison.

Area of the polder is about 32 ha as noted in the IWM map. It's a very small polder where only about 325 people live as per population census 2011 but its density is much higher than that of the Upazila and the UP as a whole. Average household size, 4.6 is very similar to that of the Upazila and UP but sex ratio is quite low 91 male per 100 female. While the UP and the Upazila have 93 to 94 percent Muslim population, village Bagirabad has 71% Hindu population. Only about 47% of the total population and 39% of female population are literate in the polder which is lower than both UP and Upazila. Village Bagiraba, despite having high proportion of Hindu population which is supposed to have higher literacy, has low literacy. The reason is, until recent years children could not go to school for poor road condition, it was not possible for the children to go to school as the roads either submerged or became extremely muddy.

Table- 3: Basic Demographic Information, Jainkathi

| SL | Particulars | Village Bagirabad | UP Jainkathi | Upazila Patuakhali Sadar |
|----|------------------------|-------------------|--------------|--------------------------|
| 1 | Area (Sq km) | 0.32 | 25.35 | 362.62 |
| 2 | Household | 71 | 3,786 | 68,813 |
| 3 | Population Total | 325 | 17,514 | 316,162 |
| 4 | Density | 1,016 | 691 | 872 |
| 5 | Household Size | 4.58 | 4.63 | 4.59 |
| 6 | Male Population | 155 | 8,601 | 155,395 |
| 7 | Female Population | 170 | 8,913 | 161,067 |
| 8 | Sex Ratio | 91 | 96 | 96 |
| 9 | Religion Muslim % | 28.9 | 93.9 | 92.6 |
| 10 | Hindu % | 71.1 | 6.1 | 7.3 |
| 11 | Christian and others % | 0 | 0 | 0.1 |
| 12 | Literacy All | 46.6 | 47.7 | 59.5 |
| 13 | Literacy M | 55.9 | 50.9 | 62.7 |
| 14 | Literacy F | 38.5 | 44.7 | 56.5 |

Source: BBS. Population Census 2011. Community Series for Patuakhali district.

Table 4 below shows employment status of male and female population (age 7+ not attending school) of village Bagirabad, UP Jainkathi and Upazila Patuakhali Sadar. In village Bagirabad, a little over two thirds of the male labor force was working, 25% reported non working and 8% reported to be involved in own household work. This data should however be read with caution because it refers to only 25 male labor force against total male population of 125. The UP and Upazila data with larger absolute population however show

a bit higher proportion of people working (75-79% (a bit lower proportion non working (17-20%) and male workers in household chores much lower (3-4%).

In Bagirabad, about 74% of the female labour force is reported to be engaged in household chores and 26 percent reported non working. High proportion of non working is reported for the inclusion of 7 to 14 years old children (both boys and girls) in the of definition labor force.

Table- 4: Employment Status of Male and Female Population of age 7+ not attending school

| SL | Particulars | Village Bagirabad | UP Jainkathi | Upazila Patuakhali Sadar |
|----|---------------------------------|-------------------|--------------|--------------------------|
| 1 | Population age 7+ not in school | 35 | 4,082 | 54,990 |
| 2 | Male | 12 | 1,711 | 23,162 |
| 3 | Female | 23 | 2,371 | 31,828 |
| 6 | % Employed Male | 66.7 | 78.8 | 75.3 |
| 7 | % Employed Female | 0.0 | 2.6 | 5.5 |
| 8 | %Looking for Job Male | 0.0 | 0.8 | 1.2 |
| 9 | %Looking for Job Female | 0.0 | 0.3 | 0.4 |
| 10 | %Household work Male | 8.3 | 3.1 | 3.9 |
| 11 | %Household work Female | 73.9 | 82.6 | 72.0 |
| 12 | %Not working Male | 25.0 | 17.2 | 19.6 |
| 13 | %Not working Female | 26.1 | 14.6 | 22.2 |

Table 5: Employment by Sector Jainkathi polder

| SL | Particulars | Village Bagirabad | UP Jainkathi | Upazila Patuakhali Sadar |
|----|---------------------------------------|-------------------|--------------|--------------------------|
| 1 | Agriculture % of male worker | 62.5 | 66.1 | 65.3 |
| 2 | Agriculture % of female worker | | 36.1 | 21.7 |
| 3 | Industry % of male worker | | 3.6 | 9.4 |
| 4 | Industry % of female worker | | 4.9 | 13.7 |
| 5 | Services % of male worker | 37.5 | 30.2 | 25.3 |
| 6 | Services % of female worker | | 59.0 | 64.7 |

Source: BBS, Population Census, 2011. Community Series for Patuakhali district

Table 5 above shows distribution of employed male and female (household chores excluded) by broad economic sectors. In Bagirabad, about 63% male workers were engaged in agriculture and remaining 37% in services. This data should be read with caution as the figures are too low, eight male workers only. The distribution by sector is better reflected by the UP and Upazila data.

1.3.3. Basic Facilities Access

Table 6 below shows access to basic facilities like sanitation, drinking water and electricity. About one third of the households in Bagirabad still use non sanitary latrine compared to 21-22% in the UP and Upazila. Access to drinking water Tube well is nearly universal in the area while about 63% households in Bagirabad have electricity.

Table 6: Basic Facilities Availability/ Access

| SL | Facilities | Village Bagirabad | UP Jainkathi | Upazila Patuakhali Sadar |
|----|--------------------------------|-------------------|--------------|--------------------------|
| 1 | Sanitary Toilet water sealed % | 43.7 | 36.4 | 29.7 |
| 2 | Sanitary not water sealed % | 23.9 | 41.6 | 47 |
| 3 | Non sanitary% | 32.4 | 20.9 | 21.9 |
| 4 | No latrine % | 0.0 | 1.1 | 1.30 |
| 5 | Water source:TW/Tape % | 100 | 98.8 | 96.7 |
| 6 | Electricity Connected % | 63.4 | 34.7 | 40.4 |

1.3.3. History of polder Bagirabad LGED Sub Project

History of polder development

Bagirabad village of Jainkathi UP, Patuakhali district was not covered by the coastal embankment project of the BWDB. Although the BWDB embankments were constructed in the southern part of the district in the 1960s, no embankment was constructed in Bagirabad Jainkathi area. In the late 1980s to early 1990s, BWDB constructed embankment in the Shehakathi area along the river Lohalong the river Lohalia. Also during this period, Bagirabad was left possibly because it is a very small and interior area away from major rivers and sea shore and less affected by salinity intrusion.

The LGED constructed 1.8 km embankment and 2 sluice gates in Bagirabad under the SSWRDP during 2001-02. The circumference of the polder is however higher as the LGED constructed embankment. In addition the west boundary is formed by a paved road constructed earlier and some sections of earthen roads. The embankment constructed By the LGED is located along the Chandanbaria canal in the north, east and south.

Expectations and Objective of Sub Project Interventions

The subproject aimed to protect mainly aman and aus paddy and homestead area from tidal inundation. Before constructing the LGED embankment, the whole area was inundated by tide water and also homesteads were inundated. There was no dry land and there was no road inside of the village. Only HBB road was located in the western boundary of the polder. In the absence of road, school enrolment was low and illiteracy was very high. Still illiteracy is high but present generation children are attending school.

Physical Environment

After constructing the embankment along with other interventions (re-excavation of canals and constructing two structure), the physical environment has improved considerably. Presently the agricultural and homestead areas are not inundated by tide water twice a day, the homesteads are not isolated from the road network. People have better access to school, health service and financial institutions like Grameen Bank. Fetching water from the

nearby tube wells is more convenient and children are attending school as the roads are no longer muddy or submerged. Women and children particularly need not keep them confined up the bamboo cod inside of the room as one step below is tide water.

With the project making the main outer road in three sides and other government project upgrading the main road in the western boundary, the scenario of the polder as a whole has changed. It is no longer an isolated village but now well integrated to local as well as national road and waterway networks.

Besides developing the main embankment cum road by the LGED sub project, the local government has improved inner roads now linking most homesteads to road network.

After having the embankment and roads, people have elevated their homesteads and monsoon rains do not flood them. As a result, tree plantation has increased and now the roads, embankment and the homesteads took very green.

2. FARMING SYSTEMS AND LIVELIHOODS

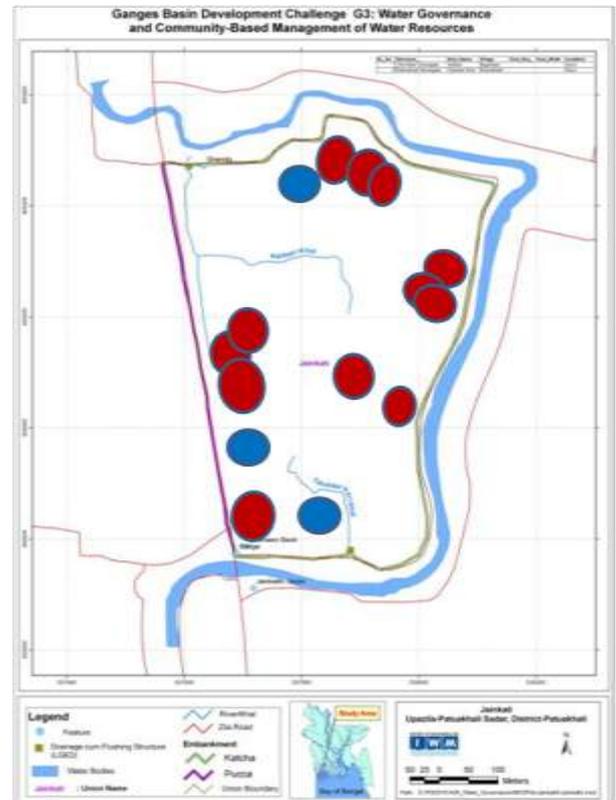
About one 35% of the polder area is elevated land where most houses are located (yellow color). About one half of the yellow area is covered by the homesteads including homestead garden (full of trees producing fuel wood, timber, fruits and also vegetables). The other half has betel leaves plantation and some water bodies (ponds and ditches).

2.1. Land use and cropping pattern

In the elevated area about 35%), 15% is under homesteads, 10% water bodies (ponds and ditches) and 10% under betel leaves plantation.

In the low land area (65%) the main crop grown is aman paddy in the kharif 2 season and pulses (khesari, mungbean, lentil, maskolai, peleng daal etc), water melon, melon, sweet potato, chili, sesame etc. during robi season. Aus paddy cultivation has now decreased to only about 10% area and Boro HYV also in about 10% area.

On the whole 75% area is under crop production including 10% area under perennial crop betel leaves. About 15% area is under homesteads and 10% under water bodies (ponds & ditches).



The above figures are worked out based on the discussion with several informants including former Vice Chair of the WMCA and a teacher living in the village. Both have farming as well as salaried service as occupation.

2.2. Present Farming System

The farming system emerged from the discussion and is currently existing is following:

- Perennial crop betel leaves (10% area).
- Fallow (aus season) followed by Aman with relay cropping of khesari (30% area).
- Aus (Mala Irri) followed by Aman (10% area).
- Fallow in Aus season followed by Aman and HYV Boro (10% area)
- Fallow in Aus season followed by Aman and robi crops (mung bean, lentil, chili, winter vegetables, melon, water melon, sesame, sweet potato, groundnut etc. (15% area).

Total of above is 75% area, the remaining 25% area under homesteads, ponds etc and this area is used for homestead gardening (all season vegetables, fruits and timber trees, aquaculture, turmeric, arum).

2.3. Change of Agriculture with Polder Development

Figure-1 below shows change of cropping with the polder development. Before 2000-2001 when polder was not constructed, only local aus and local aman could be grown and for that too, yields were very low.

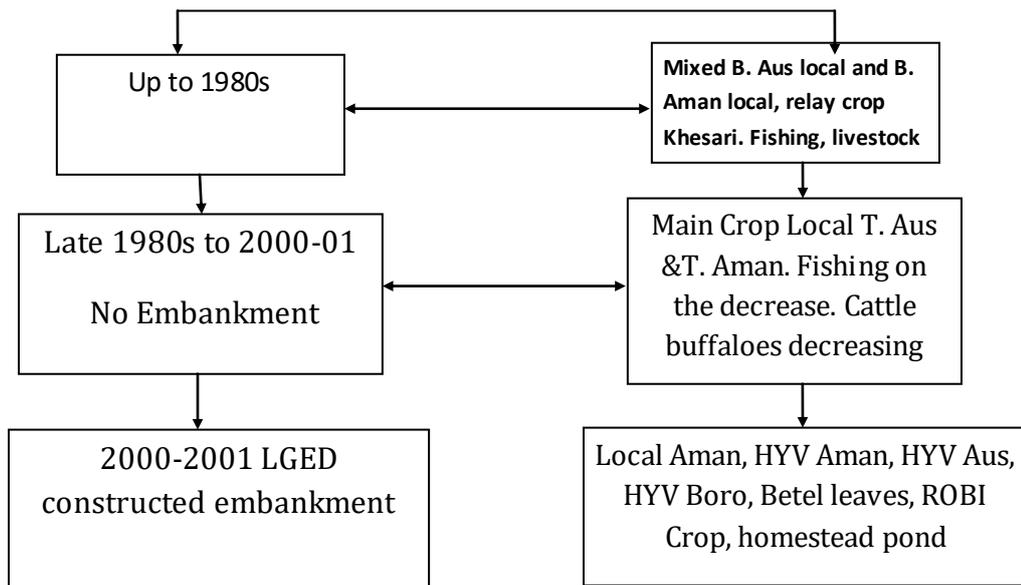
Traditional broadcast aus and aman mixed seed were sown together in April, aus was harvested in July, aman plants continued to grow with flood water rising. In the same piece of land khesari seeds were sown in November. In December aman paddy was harvested but khesari plants stayed with paddy roots. In Feb-March khesari was harvested. This was a traditional risk minimization strategy. Although three crops cultivated, yield was low due to flood or other hazards. In early to mid 1980s B. Aman and B. Aus mixed was replaced initially by T. Aus and T. Aman. But in mid 1980s to early 1990s Aus discontinued as Aus plantation was not possible. In this period pressure of flood water increased when polder built in the surrounding area but Bagirabad not protected by any polder.

Before embankment, yield of aman paddy per acre was only about 10 mounds and with 30% chance of crop failure it was effectively 7 mounds. Yield of Aus Paddy was only about 6 mounds and with 50% chance of crop failure it was effectively 3 mounds. So, yield per acre of two paddy crops taken together was only about 13 mounds. Still, farmers tended to cultivate both aus and aman hoping that at least one will have good yield. During this period, fish was abundantly available, particularly until late 1980s then it declined gradually and now very little fish are available in the nature. Cattle rearing too was difficult as all land was flooded, no space to make cattle shed. Few buffaloes were reared as they survive in wetland condition.

After 2001 when polder has been constructed, besides local aman, a number of other crops were introduced. Presently, the crops grown include local aman paddy but HYV aman is grown in part of the beel area where water depth in monsoon is only about half feet. In the deeper part of the beel, still, local aman is the main crop. The local aman varieties cultivated include lalmota, sada mota, dudkolam etc. In the elevated part of the beel local fine ricechinigura is grown during aman season. HYV aman grown include BR 23 and BR 11 and BR 39. The main aus variety is mala irri (ann aus HYV). HYV boro is cultivated in limited area. Perennial crop betel leaf is grown in round the year.

Other crops grown include pulses (khesari, maskolai, mug bean, palleng daal, lentil), oilseeds (sesame and mustard), spices (chili), vegetables (okra, brinjal, bitter gourd, cucumber), groundnut and sweet potato. These are grown in the robi season except vegetables which are grown round the year.

Figure- 1: Polder Development and the Change of Agriculture



After the harvest of aman paddy robi crops are grown in the relatively elevated area. (General & WMCA FGD)



Perennial crop betel leaf, vegetable are popular in high land

2.4. Crop Seasons

Table 7 below shows details of various crops grown in various seasons and approximate yield.

Table-7: Crops produced in various seasons and yield

| Crop | Variety | Season | Duration | Irrigation | Yield (rice kg/ha) | % of area under the crop |
|---------------------|--|------------------|--|---|--|---|
| T-Aman Paddy HYV | Dudh kalam, BR-39, BR-11 | Kharif -2 | July-August and harvesting November-December | No irrigation required / rain water, canal water through sluice gate | 40 mound pddy/acre = 2,600 kg rice/ha | 20% of the beel area (13% of whole aea) |
| T. Aman Local Paddy | Lal mota, sada mota, Dud kolam, Cinigura | Kharif-2 | July-August and harvesting November-December | No irrigation required / rain water, canal water through sluice gate | 30 mound paddy per acre= 1976 kg rice/ha | 80% of the beel (52% of whole area) |
| T-Aus Paddy | Mala Irri | Kharif -1 | <i>April-July</i> | Mainly rain-fed, canal and sluice gate water | 25 mound paddy per acre = 1646 kg rice per ha | 10% of the beel area (6.5% of whole area) |
| Boro paddy HYV | BRRI-28, 29. HYV | Robi/Boro season | February-May | Irrigation is needed (Irrigation block-LLP) canal water through sluice gate | 60 mound paddy/acre = 3952 kg rice/ha Per acre 200 mounds | 10% of the beel area (6.5% of whole area) |

| Crop | Variety | Season | Duration | Irrigation | Yield (rice kg/ha) | % of area under the crop |
|--------------|-------------------------------------|-------------|-------------------|-------------------------------|--|--------------------------------|
| Betel leaf | N/A | Perennial | Round the year | Little/No irrigation required | Per acre Tk. 1,333,333 = Tk. 3,2933,333/ha | 10% area |
| Sweet Potato | Potato and sweet potato | Robi season | February to April | No irrigation required | Good Per acre req 80-100mound or 7,904 kg/ha | 2% |
| Pulses | Lentils, Mugh bean, Khesari, Lentil | Robi season | February to April | No irrigation required | 30 mound per acre or 2,964 kg/ha | 20% of beel, 13% of whole area |

Source: FGD, KII and follow up discussion

Table 8: Crop Calendar

| Crop/ Fish | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|--------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Aus Seedbed | | | | | | | | | | | | |
| T. Aus | | | | | | | | | | | | |
| Aman Seedbed | | | | | | | | | | | | |
| T. Aman | | | | | | | | | | | | |
| Boro Seedbed | | | | | | | | | | | | |
| Boro HYV | | | | | | | | | | | | |
| Khesari | | | | | | | | | | | | |
| Robi Crops | | | | | | | | | | | | |
| Vegetables | | | | | | | | | | | | |

Note: Khesari is relayed with aman. Seeds are sown in aman area a month before harvest.

Seedbeds are made in small plots in the elevated land then transplanted in the main plots.

2.5. Irrigation Sources, Cost of Production and Profitability

Irrigation

Aus and Aman paddy are mainly rain-fed as they are grown in monsoon season. But farmers in Bagirabad have an advantage that they can irrigate by taking in water from the canals using the sluice Sharifbari gate. Farmers in the southeast face difficulty of irrigation as the Talukdarbari gate is closed.

LLP is used to irrigate in the HYV boro season and also for a number of robi crops, vegetables and betel leaves. However no irrigation is used for khesari, lentils, mustard etc.

Productivity

Before embankment, HYV aman was not cultivated. Only local variety aman was cultivated in the most of the area and yield was only 10 mounds paddy per acre and still having chance of frequent crop failure. Making allowance for crop failure, yield was only about 7 mounds paddy per acre. This is equivalent to 463 kg rice per ha. Aus paddy was produced in some land in the upper of peripheral area and yield was only 6 mounds paddy per acre and chance of crop failure was about 50:50. Making allowance for crop failure yield per acre was only about 3 mounds paddy per acre which is equivalent to 199 kg rice per ha. No other crop was important. Vegetables, chili, sweet potato etc were cultivated in small areas around homestead land or canal sides. These were of so little significance that respondent felt it not worth mentioning.

After constructing embankment, both local and HYV aman are cultivated, still local aman in larger area and HYV aman in smaller area, roughly in the ratio of 80:20. Yield of local aman is 30 mounds paddy per acre which is equivalent to 1976 kg rice per ha. Yield of HYV aman is 40 mounds paddy per acre equivalent to 2635 kg rice per ha. Boro HYV is cultivated in about 10% area and yield is 60 mounds paddy per acre equivalent to 3952 kg rice per acre. Aus HYV is cultivated in about 10% area and yield is 25 mound paddy per acre equivalent to 1647 kg rice per ha.

Betel leaf is produced in about 10% area. Yield was not mentioned in quantity but it was said that from one katha (0.03 acre) land, expected yearly sale is Tk. 40,000 which is equivalent to Tk. 1.3 million per acre or Tk. 3.29 million per ha. Farmers' experience indicated that one half of it is cost of production, the other half is farmer's income.

Profitability

Profitability or cost of production and return to farmers has been calculated for local Aman, HYV aman, HYV Boro, Local Aus, Khesari and betel leaves. These are noted below at Table 9. These are the crops occupying 10% or above land of the polder area.

Table 9: Cost of production and return to farmers (Tk/acre)

| Items of Cost/Return | Local Aman | HYV Aman | HYV Aus | HYV Boro | Khesari | Betel leaves |
|-----------------------|------------|----------|---------|----------|---------|--------------|
| Land preparation | 2,000 | 2,000 | 2,000 | 2,000 | | 60,000 |
| Seed/ Seedling | 2,000 | 2,000 | 2,000 | 2,000 | 400 | 60,000 |
| Sowing/ planting | 3,000 | 3,000 | 3,000 | 3,000 | 600 | 120,000 |
| Weeding/ crop care | | 2,000 | 2,000 | 3,000 | | 60,000 |
| Fertilizer/ pesticide | 500 | 1,000 | 1,000 | 2,000 | | 60,000 |
| Irrigation | | | | 3,000 | | 10,000 |
| Harvesting | 3,000 | 4,000 | 3,000 | 5,000 | 1,000 | 60,000 |
| Materials (bamboo) | | | | | | 200,000 |
| Total Cost | 10,500 | 14,000 | 13,000 | 21,000 | 2,000 | 630,000 |
| Yield (mound) | 30 | 40 | 25 | 60 | 15 | NA |
| Price Tk/unit | 800 | 800 | 800 | 700 | 600 | |
| Total value of crop | 24,000 | 32,000 | 20,000 | 42,000 | 9,000 | 1,300,000 |
| Gross return | 13,500 | 18,000 | 7,000 | 21,000 | 7,000 | 670,000 |
| Imputed family lab | 4,000 | 5,000 | 4,000 | 6,000 | 1,000 | 240,000 |
| Imputed land rent | 1,500 | 3,000 | 2,000 | 6,000 | 1,000 | 60,000 |
| Net return | 8,000 | 10,000 | 1,000 | 9,000 | 5,000 | 370,000 |

Source: Calculation based on FGD and KII and Follow up discussion with Mr. Kumud Roy, Teacher and Farmer

2.6. Livestock

Until 1980s, Bagirabad people had many buffaloes and cattle. In the 1990s both cattle and buffaloes declined. Cattle rearing became difficult as pressure of flood water increased when polders were constructed in the surrounding areas. Another reason for decreasing livestock is in the 1990s is the introduction of power tiller for tillage purpose hence farmers need to rear cattle and buffaloes declined. After 2000 the opportunity of cattle rearing increased and but it did not increase much because of the decreased need for animal power in agriculture. Power tiller has to a great extent replaced buffaloes and cattle to plough the land. Now people in Bagirabad are rearing cow for milk rather than bullocks for tillage. Buffaloes are still seen but in less number. Please note Bagirabad is a non-saline area, there is no shrimp farming, paddy is produced in three seasons (mainly aman but aus and HYV Boro also cultivated) and khesari and other pulses are produced. All these crops provide cattle feed and fodder. Still the livestock rearing has fallen. The reason is decreased need for cattle rearing, particularly buffalo rearing. However, compared to shrimp area, this polder has higher density of cattle and buffaloes and the animals look relatively healthy.

2.7. Livelihoods

In the past, three main occupations were crop farming, livestock rearing and fishing. In the 1990s, before embankment, livestock declined, fishing also declined and crop farming declined too, all because of increased pressure of flood. Then people from the area migrated to other areas for seasonal employment and many migrated to urban areas. Now crop farming opportunity improved and people find work in the area. Responses of the participants about livelihoods are noted below:

- In the past (before embankment) most people worked outside of the polder as day labour, Rickshaw Puller, Mason etc. (FGD_WMCA)
- Local people suffered a lot due to food insecurity.
- Now local people are cultivating different types of paddy (T-Aman, Aus, Boro), pulses like, *Mughbean, Kheshari, Mushuri, peanut, sweet potato, sunflower etc.* (FGD_General and WMCA)
- People are rearing cows, goats, hens, ducks etc. these also increased compare to pre-2000. (FGD_General and WMCA).
- But buffaloes and bulls definitely declined (Mr. Kumud Chandra Roy said in follow up discussion).
- Now, employment opportunity has been increased(WMCA, General FGD)
- Landless people leased land for cultivation (General FGD).

2.8. Drinking water

Drinking water access is not a serious problem in Bagirabad Jainkathi polder. The BBS data shows that 100% households have access to tube well for irrigation. However, informants in the LCS group reported of still having problems to access drinking water and water for other domestic uses. The answers are provided below:

- Drinking water scarcity still exist, We have to collect water from half a mile away
- Still, we use canal water (Chandarbaria khal) for cooking, bathing and washing
- Chandanbaria canal water is not clean, water is mixed with mud.
- We collect this water during high tide and preserve it for two-three hours for making it usable for cooking.
- DTW for drinking water are located in the affluent people's house like Sharifbari, Talukdarbari, Kulubari and Kalibari.

3. PHYSICAL CHARACTERISTICS OF POLDER JAINKATHI SUB PROJECT

3.1. Condition of the embankment

As noted earlier, west side of the polder is a paved road, hence it is in good condition. Also the west side has no parallel canal to be affected by erosion. Other three sides are earthen hence height reduced gradually by rain cuts and easy removal of top soil. These three sides are also vulnerable to erosion as surrounded by Chandanbaria canal. The WMCA members in the FGD and general FGD participants stated that:

- The embankment became narrow and its height is low. (General FGD, WMCA)
- *Embankment* is so weak that even low tidal surge may cause *its* collapse. (Gen FGD)
- Embankment condition is comparatively good (in the western part) but the South part of the polder is narrow, low height and broken (WMCA).
- There is canal bank erosion in the southern part of the polder



Embankment condition good in the southwest from GB office to Talukdarbari gate

3.2. Condition of Sluice gates

Gate no.01 (shorif bari gate) is active and operated by the WMCA members but its link canal (Kalibari canal) is being silted and is full of water hyacinth

Gate no. 02 (called Talukder bari gat) has been closed by the Talukder bari people since 2005. The participants desired that the WMCA through consultation with local people should open this gate.



Gate no. 01: Gate functional, canal getting silted, full of water hyacinth and embankment height low and width narrow.

3.3. Condition of Canals: siltation and private control

There are three canals in and around the polder. All are reportedly silted Chandanbaria canal is a Government canal surrounding the polder in three sides- north, east and south. Participants desired re-excavation of Chandanbaria and Varaniar khal with a remark that they are “more silted”. Actually Varaniar khal is another name of Chandanbaria khal in the north side. The whole canal is under the management of the Upazila administration.



Chandanbaria canal at low tide

The Kalibari canal is silted and full of water hyacinth. This canal was re-excavated in 2001 under this sub project but it is getting silted again which is a natural process.

Talukdarbari canal linked to gate no. 02 was also re-excavated in 2001 under the same project. The gate number 02 is reportedly located on private land owned by Talukdar family and canal is also reportedly located on private land. However, the gate was constructed and the canal re-excavated in 2001 definitely with the consent of Talukdar family and in consultation with the community. But since 2005 the canal has been closed by the “Talukdarbari people” that made the gate useless as far as benefit to other people is concerned.

Due to closing of Talukdarbari gate (gate 02) and siltation of canals, middle (and south eastern) part of the polder remains waterlogged during monsoon. The problem is more acute in the catchment area of Talukdarbari khal.



Pic- Talukdarbari canal outer side active but inner side closed.

Canal Lease

Canal lease issue did not come up in the discussion as the canals inside (Kalibari and Talukdarbari) are not under lease. Talukdarbari canal is closed but lease is not an issue here.

3.4. Main water-related problems

The FGD and KII participants highlighted a number of problems. These include water-logging, siltation, lacking access to canals for irrigation, fetching drinking water away from house, highland low land issue, water for other domestic uses (cooking, bathing etc) and closing canals by force. Briefly, the participants’ statements indicate that:

Betel leaves plants were dying for inadequate irrigation. The farmers required taking of water by pipe from the canals and that involved payment for laying pipes or low lift pumps (said LCS group as some of LCS members have betel leaves and vegetables cultivation). Open access to canals could reduce cost.

There are enough tube wells for drinking water but poor households not having pond use canal water for cooking, bathing etc. The canals are emptied in low tide so they have to wait for high tide for bathing or collecting water for cooking (LCS). To them tube well water is not good for cooking – it takes longer time to boil rice! (LCS FGD).

Smallholders' land is relatively higher in elevation. Canal water does not reach there as Talukdarbari people do not open the gate because they have low land near the canal and such lands get flooded if water has to reach high land (LCS FGD). Talukdarbari people do not open it as their seedbeds in the low land get submerged. – General FGD

The rich had another view. To them water can be drained by pipe or if low land submerged or irrigation can be provided by pipe if needed. To them this is not a problem because they control canals and can afford pumps when needed.

Woman household head in the KII gave a different ranking of problem. To her, drinking water problem is number one followed by drainage and irrigation. Farmers' priorities (general FGD) were irrigation and drainage.

Interestingly, the woman WMCA member in the KII could not find any problem as "the WMCA is functioning well" and the UP member felt that high land low land issue can be resolved by "discussion" in the WMCA and the UP assists to resolve such problem. They might have said so as they are part of the elite group.

High low land issue came up again in the KII with former Vice Chair of the WMCA. He specified that this problem is more acute in the southeast, next to Talukdarbari canal. He suggested constructing another gate in the southeast. But this is unlikely to solve the problem as another Talukdar will grab it.

The landless man consulted in the KII mentioned of three problems, irrigation and drinking water and drainage. To him drainage problem was more acute in the southeast.

Interestingly, not only the Talukdarbari gate (which is closed permanently), the Sharifbari gate is also closed as per wish of Sharif family. The paddy farmer met in the KII said that it was closed for two weeks and it was not opened even after complaining to LGED.

4. LGED: ADDRESSING WATER INFRASTRUCTURE PROBLEMS

SSWRDP project and WMCA

The LGED handed over the sub project for O&M to WMCA in 2002 after the construction was completed and the WMCA registered from Upazila (or district) Cooperative Office in 2001. District Cooperative Officer is registration authority. The WMCA president/secretary attend monthly meeting at the Upazila and tri-monthly meeting held at district headquarters.

Usually local LCS groups utilized for earthwork, if not available then non-local labor are engaged.

It was said that the WMCA has income generating activity which not existing now and in the past they had one, three plantation. Loan was given to members but recovery was not possible and savers did not get back their money. Now it is not functioning. Monthly 3% interest on loan was supposed to cover various costs of the WMCA besides Tk. 2.00 monthly

fee from each member. But fund collection is almost abandoned. Present balance at bank is Tk. 35,000 only.

To improve water management infrastructure and manage them effectively, the LGED made some engineering interventions and helped establishing a community level Water Management Cooperative Association. The LGED activities carried out in the pre-project, during project and after project are briefly described in this section.

4.1. LGED Pre-Project

Mobilization and Formation of WMCA

LGED facilitated formation of WMCA when the SSWRDP project started in 2000, the WMCA was registered in 2001. LGED CO worked in the field level to organize WMCA and the LCS. The founder members and the UP played important role in the formation of the WMCA.

Besides formation of the WMCA, the community level consultation, survey and participatory rural appraisal were held to get peoples opinion and involve them in the sub project activities.

Membership Composition

The WMCA comprises 85 general members. Of them 12 are elected as Executive Committee members. One of the 12 EC members is a woman and 25 of the 85 general members are women. Members belong to various socio economic categories such as elite, farmers, landless and women. People from all such groups are included as WMCA members.

Sub Committees

The WMCA has three sub committees. The maintenance committee is responsible for operation, repair and maintenance of the gate including the canals and minor repair of the embankment. Sunil (member of the WMCA) is in charge of the maintenance committee. The WMCA also expends some money for repairing activities from time to time. Minor repairing and earthen work is done by the initiatives of the community people and organized by the maintenance committee of the WMCA.

The loan committee is responsible for collecting savings, providing loan. It keeps records of transaction by a designated member. The committee is reportedly "active" and meets "monthly". But at the same time high "loan default" is reported which does not imply that the subcommittee is active.

The managing committee- has oversight role. It supervises the WMCA activities, particularly the O&M carried out by the maintenance committee.

Membership Contributions

Each member pays Tk. 10 as admission fee to become a member and pays monthly 22 taka of which Tk. 20 is monthly savings and Tk. 2 is contributed for miscellaneous expenses.

4.2. LGED during project

WMCA and ability to influence design

LGED has designed and constructed the embankment, excavated the canals and built two sluice gates through consultation with the community and UP (WMCA). In the planning stage and during implementation, the community members were able to give opinion on site selection and type of interventions and such opinion were valued by the LGED.

Election and representativeness

The general members elect EC every three years. As per cooperative law a person can be elected for a maximum of two terms in the EC. So, nobody can stay in the EC more than six consecutive years. This provision is made in the cooperative law to rotate and build up leadership.

Physical Interventions

The LGED implemented the following interventions under the SSWRDP in 2001-02

| | | | |
|------|---|----------------|----------------------|
| i. | Embankment Re-sectioning | 1.85 km | Tk. 1,372,677 |
| ii. | Kalibari Khal Re-excavation | 1.2 km | Tk. 31,391 |
| iii. | Kalibari Khal Pipe Sluice at Ch.0+490m | 2-V(900mm Dia) | Tk. 1,405,805 |
| iv. | Taluderbari Khal Pipe Sluice at Ch.1+650m | 1-V(900mm Dia) | Tk. 2,884,337 |
| | Total Cost | | Tk. 5,694,210 |

Source: LGED, SP Information

Training

The general FGD participants said that 12 members of the WMCA received training of LGED. The topics covered were formation of cooperative, collection of savings and maintenance of record etc. After phasing out of the project no more training is provided.

The WMCA members in the FGD said that they received training on agriculture. The training course was provided at the Cooperatives Training Institutes located at Barisal, Madaripur, Faridpur and Khulna. Mention of four different venues imply that the training was provided several times and to cover several aspects and include participants in batches.

The LCS group said in the FGD that they received training from LGED on earthwork. The training was held at a local school. It taught how to cut and fill, from where to cut etc.

4.3. LGED post-intervention

LGED support in the post-project period

The LGED continued support to the WMCA after completing the main construction work during 2001-02. In 2002 the LGED handed over responsibility of operating and maintaining the polder to the WMCA but continued assistance for repair work overall maintenance responsibility. LGED's regular support is provided to the WMCA through preparation of the O&M plan on yearly basis and implementing it with full involvement of the WMCA and the LCS. It is LGED's policy that they take care of "major repair" while the WMCA is assigned responsibility to take care of "minor repair". This policy was acknowledged by the WMCA EC members as well as other participants met in the FGDs and KIIs.

It is evident from the LGED Sub Project information that the first O&M plan was prepared in 2000 but O&M implementation began in 2002 with initial spending of Tk. 1500 only. O&M spending was highest Tk. 55,400 in 2006 against planned activity of Tk. 104,528 and in 2008 it was Tk. 15,000 against planned activity of Tk. 161,000. The large difference between need and actual spending could be because of low budget received from the LGED and low capacity of the WMCA to contribute as 5% of 10% cost sharing by the community.

The activities of the LGED and the WMCA after project period are reflected in the following information obtained by the FGD and the KIIs:

LGED prepares schemes for repair works (meaning O&M plan) – WMCA and have repaired embankment after Sidr in 2009, allocated money for repair to the WMCA twice in the last in the recent past (did not mention year and amount), re-excavated Chandanbaria canal in 2007 and trained WMCA members. – WMCA FGD

The LGED officers told the WMCA to operate gate for the benefit of “all” people and they visit some times to see problems and discuss with the WMCA. If repair is needed WMCA informs LGED and then the Upazila Engineers seeks fund from higher authority. With such funding, the LGED re-excavated Chandanbaria canal in 2003.

The LCSs are reorganized as and when necessary as old ones often discontinued work as LCS labour because of uncertainty of employment and low wage and new ones are taken in. Three years ago the LGED formed a new group which the team met for FGD. Besides forming LCS, the LGED gave training to LCS members and provided some materials like water jar, glass, sanitary latrine etc. Responding to WMCA request, LGED replaced wooden shutter of gate 1 by iron shutter.

Participants' view of the LGED performance

Besides the above positive remarks about continued support from the LGED the informants also remarked that the LGED was unable to help instantly after disasters. After AILA, the LGED could not help. – WMCA

It was also alleged that some (influential) people like those from “S” family have close alliance with the LGED officials. That is why despite complaints about the improper operation of gate 1 (for their interest, not all peoples interest), LGED did not intervene. Therefore another gate was demanded near Roybari (Mr, P.C., Gen FGD).

4.4. Appraisal and actual achievements

The sub project information noted that the Jainkathi SP aims to protect crops as well as well as homestead land for inundation by tide water. As an FCD project, it also aimed to improve drainage since it included re-excavation of canal. The appraisal report envisaged 114% increase of cereal production. Non cereal crop production was assumed to remain unchanged and it was apprehended that fish production will decrease by 90 percent.

The field data reveal that yield of the main crop aman paddy increased from 10 to 30 mounds per acre, HYV aman has been introduced which yield 40 mounds per acre and HYV Boro also introduced which yield 60 mounds per acre. Twenty percent of local aman area has been taken over by HYV aman and HYV boro is cultivated in 10% area by increasing cropping intensity. With these taken together is calculated that paddy production increased by 280 percent. Aus area decreased but the loss has been fully compensated by replacing

aus local with aus HYV. Hence production of cereal crop increased by 280% far above the appraisal 114%. Non cereal crop was supposed to remain unchanged but that too has increased. Particularly, betel leaves became a highly profitable commercial crop. It does not need large plots, hence small and marginal farmers are benefited. The both objectives increased crop production and better protection of the area from flood have been achieved.

What has not been achieved is the institutional sustainability, the WMCA to be managed in the interest of all stakeholders and taking over of O&M responsibility by them.

5. LABOUR CONTRACTING SOCIETIES

5.1. Formation and work with the WMCA

Formation

The LCS met in the FGD was formed in 2006 or three years (Mala of LCS group member gave two different answers and others could not remember year of formation). Ex Vice President of the WMCA said that LCS was formed in 2001 which coincides with the physical implementation time. All could be correct as formation of LCS is a continuous process, if some ones become inactive, new ones formed or new members included. Both men and women were involved in the LCS. One woman LCS member said that she and her husband both worked in the LCS but they were not currently working in the LCS in the absence of ongoing work.

Payment

Each LCS member received Tk. 120/day and wage was paid on time. Workers are contracted for three months and quantity of work is specified in the contract, 200 feet earthwork (not mentioned in how many days or by how many workers and whether it is meant cubic feet). But it is clear a quantity of work is fixed and that has to be done to get payment.

Problem

No problem was mentioned except that after three months contract they become unemployed again. One woman LCS member said that when she had LCS work the household had good income but now there is no work as there is no ongoing works.

Type of work

The LCS groups are engaged for earthwork. The woman LCS group met in the FGD worked to re-excavate Chandanbaria canal after Sidr in 2007. It means that it was possibly formed in 2006. But the LCS group has no work now.

Now, many of those women assist their husbands in the agriculture field and to rear cattle, goats and poultry.

Training

LCS members received training from LGED on earth cutting.

5.2. LCS livelihood

Before construction (before 2000)

There was no employment opportunity inside the polder due to water logging and high tide each day. Landless and unemployed people went to local town as well as Dhaka, Barisal, Patuakhali and Satkhira for work as mason labor, rickshaw driver, housemaid etc. In those days they could not afford even two meals a day (LCS). They could not cook and sleep comfortably and safely due to tide water coming inside of the house.

During construction (2000-2001):

The landless and poor women got LGED work and for which daily wage was Tk. 120. (CO, LGED). The LCS workers were able to save money by working in the road, canal and the embankment (LCS woman). With accumulated savings many have bought cow.

After construction (after 2001):

Crops are grown in all three seasons. So people have more opportunity to work in the field as well as at home.

Crop yield increased and commercial crops cultivated. One LCS woman said: "I have two katha lands for betel leaf from where I get regular money, my husband also works outside"). She sold betel leaves of Tk. 3000 a month ago and yearly she earns Tk. 30-40 thousand by selling betel leaves. Now her children are going to school, husband honors her and she now earns for the household.

Many LCS women rear cow and thus have increased their household income (LCS), but the problem remains as there is no ongoing LCS work.

Most important use of water

In this polder there are enough Tube Wells for drinking water although some have to collect water from up to half kms away. Water for irrigation appeared important even to the LCS women. The LCS women members belong to households owning some land. One such woman owned 7 katha (21 decimals) land of which 2 katha used for betel leaves cultivation and 5 katha for other crops including vegetables. Such crops need irrigation. Closing of Talukdarbari canal was a problem.

Water for cooking and bathing was a problem to the LCS group. They bath in the canal and have to wait for high tide. Also they collect water for cooking from the canal. In their opinion, tube well water is not good for cooking. Poor people like LCS members do not have pond. Hence they collect water from the canals in high tides for cooking purpose.

5.3. Governance and water management**Accessible institution for complaints and problems**

The LCS group faced problem to access canal for irrigation. They complained to the WMCA and the LGED. But could not get any remedy. The WMCA is already captured by the elite. In the past, the LCS group members including women LCS members were also WMCA members. But now they are not members. They deposited savings but did not get back the savings. So they do not find interest to stay in the WMCA. Complaining to UP also did not help. The problem is that the Talukdarbari people are influential. They do not listen to others. They understand their interest. Talukdarbari people have low land. Our land is high land. If they open the canal to reach water to our high land, the low land gets flooded. Further, the Talukdarbari people have blocked the canal for fish farming. No institution has been able to solve this problem.

6. MAINTENANCE OF EMBANKMENTS, CANALS AND SLUICE GATES

LGED has overall responsibility to maintain in cooperation with the WMCA. O&M responsibility of the polder has been handed over to the WMCA which takes responsibility of minor and emergency repair while major repair is seen as responsibility of the LGED. The UP is least involved in maintenance except some emergency repair. Participants' view of the maintenance by the LGED, UP and WMCA are noted below.

6.1. Maintenance by LGED

To monitor, supervise and plan maintenance, the LGED visits two times early and finds out any repair needs and in this regard they consult WMCA members - (WMCA FGD). The LGED provides support to the WMCA for major repairing works.

In the recent past, the LGED supported embankment repair work after cyclone Sidr and Aila (WMCA) and re-excavated varanir canal, meaning Chandanbaria khal after cyclone Sidr - (UP member). LGED also supported tree plantation work in some portion of the ring embankment

However, the WMCA members said that about 35% of the allocation for embankment repair is misappropriated - (WMCA)

6.2. Maintenance by Union Parishad

Generally, the UP has no role in regular maintenance, but, during emergency they do some repair work as learnt from the general FGD. After Cyclone Sidr and Aila, the UP repaired the broken embankment. It was a patch work and not very fruitful. The UP chairman himself said in the KII that the embankment damaged during cyclone Aila and Sidr could not be repaired properly.

6.3. Maintenance by WMCA

The WMCA has a maintenance committee responsible to maintain gate (nothing mentioned about canals and embankment) and the WMCA takes care of minor repairing work carried with their own funds. During emergency situation WMCA repairs the embankment using their savings. Minor repair of gate meant replacement of screw, nuts and tar painting of the shutter.

The WMCA cleaned water hyacinth of Kalibari canal but it was not fruitful and the canal was again filled by water hyacinth soon.

The WMCA wants more tree plantation by the side of the embankment to be controlled by them and intends to use its income for repairing embankment (WMCA)

6.4. Maintenance by gher owners and landowners

There is no aquaculture gher in this polder. The Talukdarbari canal is blocked for aquaculture but the canal gharbar is using it as private property and bears no responsibility to repair, maintenance and also does not allow other farmers' access to the canal and the gate.

6.5. Institutional responsibilities in maintenance

Table – 9: Institutional responsibilities or roles played by various actors in maintenance, Jainkathi

| Tasks | Who does | Whose mandate | Comment |
|-----------------------|-------------|---------------|--|
| Minor maintenance | WMCA | WMCA | Inadequately |
| Major maintenance | LGED | LGED | Not regularly and not adequately |
| Emergency maintenance | WMCA and UP | WMCA and UP | UP role is very limited |
| Excavation of canals | LGED | LGED | LGED did it only after cyclone sidr and AILA when fund was available |

6.6. How does maintenance take place?

Maintenance by LGED

After hand over of the sub project in 2002, they gave the maintenance charge to WMCA (CO-LGED). The LGED repaired Sharifbari (Kalibari) gate by replacing shutter (UP member) but did not repair the structure since construction in 2002.

Talukdarbari gate has been closed since 2005 but the LGED could not reopen it and seemingly have been unable to take drastic action against the offenders. It is evident that the LGED consulted local community including concerned landowners of Talukdarbi about construction of the Talukdarbari gate. Then they agreed to give access the local community to open and close the gate. (WMCA). But now the gate is closed.

Maintenance by UP

UP is not involve in maintenance of the sluice gates and embankment in this sub-polder Also the UP could not convince Talukdarbari people to open the gate as was reported by the UP Chairman himself. WMCA shared the issue with the UP, but there no result. The Talukdarbari people are very powerful, said the UP Chairman.

Maintenance by WMCA

The WMCA carried out minor repairing work like replacing nut and screw and tar painting of shutter etc. (WMCA). WMCA at one time made wooden shutter, later the LGED provided iron shutter at Sharifbari (Kalibari) gate.

WMCA consulted with Talukdarbari people, UP and LGED about Talukdarbari gate to open it for all, but failed (WMCA).

7. OPERATION OF SLUICE GATES

7.1. Operation by WMCA

WMCA is responsible for operating the gate, opening and closing as per the need of farmers in general, not particular section of farmers. It is reported that the WMCA consults farmers while deciding to open or close the gate (WMCA and gen but it revealed from the discussion with the LCS group who have some farming that the decisions go in favor of few elite and not in the interest of all farmers or majority of the farmers. Particularly, Sharifs and Talukders take control of the gates.

One WMCA member (Sunil) is given responsibility to operate. The gate operator does not get any remuneration. WMCA after consulting with farmers decide to open and close the gate. One gate is closed permanently. The other closed during robi season (Oct-Dec to Apr/May). It is opened in May/June and closed again in Oct (FGD-general).

One reason of keeping Talukdarbari gate closed was “feel disturbed because of shout, if people come to open and close the gate” as stated by a woman of Talukdarbari. But actual reason seems taking control of the gate and the canal in their interest as mentioned by other farmers.

7.2. Operation by LGED

LGED has given charge to open and close the gate to WMCA (CO-LGED). But no strong monitoring by local level LGED officials was and they just visit occasionally (twice a year of if there is serious problem in their assessment). They however come after disasters. (WMCA). It was noted by the facilitator that the CO has little knowledge about the polder operation in Bagirabad.

7.3. Operation through Union Parishad

The UP is not at all involved in water management. The WMCA members remarked that they come for vote, nothing else. They play no role in operating gate even if problem arises as reported by the WMCA. But the UP member interviewed said that if some farmer or WMCA approach they “consult” WMCA to take corrective measures. This could be correct but such consultation does not yield any fruitful result even if consultations held. Because they do not take people in confidence rather take side of the elite.

7.4. Operating private gates.

There is no private gate in this small polder but Talukdarbari gate effectively gone under private control.

7.5. How gate operation takes place

Table 10 below provides a description of gate operation in JainkathiSub Project area.

Table 10: Operation of sluice gates in Jainkathi Sub Project Area

| Type of Gate | Formal authority as stated by respondent | Effective control | Gateman | Gateman's pay/ Cost & how paid | Operator's interest stated vs real |
|--------------|--|----------------------------------|--|--------------------------------|--|
| LGED gate 1 | WMCA | WMCA but dominated by Sharifbari | WMCA assigned responsibility to one member (Sunil) | No pay, voluntary work | Voluntary work. Control over the gate and canal for own interest besides interest of the elite |
| LGED gate 2 | WMCA | Talukdar family | WMCA gate has no role here | Not applicable | Gate closed by Talukdar family |

8. CONFLICTS

8.1 Conflicts regarding high land and low land

High land low land conflict is most important in this polder. The land inside of the beel is mostly owned by the wealthier families like Sharif and Talukdar. Whatever small pieces of land are owned by the small and marginal farmers are located in the high land area. The land use pattern is also different. The high lands are used more for vegetables, spices, sweet potato and betel leaves. The low lands are used mainly for paddy. The smallholders want access to canals for irrigation for robi crops while the wealthier farmers have and can afford irrigation by Low Lift Pumps.

Conflict occurs when the high land farmers want to keep canals open to take water for irrigation (robi crops as well as paddy) the low land owners want to keep the canals closed as taking more water will flood the low land area. The problem can be resolved by differentiated timing of plantation, proper land use planning, use of pipes to supply water or drain water from varying land elevation and making of inner dykes and drains. These require massive amount of community level consultation, building of trust and cost sharing mechanism which could not yet develop.

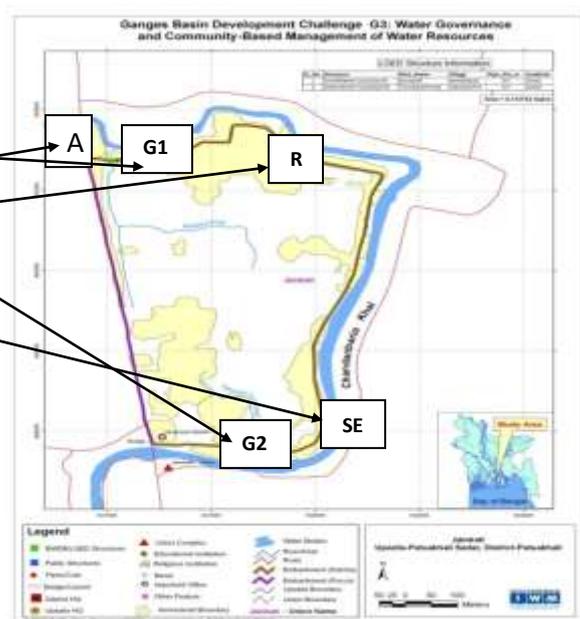
8.2 Conflicts on the Control of Gates

Conflict between Talukdarbari and Others

Gate number 2 called Talukdarbari gate is located front of Talukdarbari and the adjoining land belongs to Talukdarbari. Taking this advantage, the Talukdarbari people have closed the gate depriving all others accessing benefits of this public investment. With complete closing of the gate since 2005, the Talukdarbari people have made this canal a private aquaculture area. Adjoining farmers desire accessing the canal for irrigation but they are deprived of it. The same cannot be used for drainage also. As a result the middle and southeastern parts of the polder became water logged. Now people are demanding another gate in the southeast. But that too is unlikely to solve the problem and another Talukdar will eventually close that one.

Legend:

Existing Gates: G1, G2
New gate suggested: A near Akbar's shop, R near Roybari
SE substitute of Talukdarbari gate in the southeast



Conflicts between Sharifbari and others

Gate number 1 called Kalibari or Sharifbari gate is effectively under control of the Sharifbari people and the WMCA president belongs to Sharif family. This gate is opened and closed in by the decision of the WMCA and operated by a designated member. The opening closing decisions are reportedly taken by consultation. But for whose interest remains a question. It was evident from discussion with a paddy farmer that the gate was opened and closed as per wish of the Sharifbari people and they tended to dishonor views of other farmers if it goes against the interest of the Sharifbari. The concerned paddy farmer said that for more than two weeks the gate was kept closed and it was not opened even after complaining to the LGED. Farmers having land in the eastern part of the polder was demanding another gate near "Roybari" and yet another group was demanding a gate near "Akbar's shop" although Akbar's shop is very close to the existing gate number 1. But there is no guarantee that more gates will solve the problem and those will not go under the control of Akbar's and Roy's.

8.3. Conflict mitigation

Conflicts are not really mitigated. The WMCA is said to mitigate conflict but they serve interest of the elite and is unable to tackle situation like Talukdarbari khal. The UP is also not involved in water management related conflict mitigation. Sometimes aggrieved farmers complain the LGED and they cannot influence unilateral decisions of the Talukdarbari and Sharifbari people. UP tried to convince Talukdarri people to open the gate but there was no positive result.

8.4. Participation, Exclusion and Gender

Discourse on participation

One general FGD group said that participation means having a functional EC, loan disbursements made by collective decision and recovered by collective action. This group also said that the leaders should be people acceptable to all, be knowledgeable, and must value opinion of others. Another general FGD group said that the landless and women are included in the WMCA, the WMCA makes collective decision, so they have participation. To them, participation meant "involving all" in "any activity".

The WMCA FGD opined that they have an EC comprising 12 members, 15 landless and 25 women are general members and the WMCA meets on monthly basis, hence there is participation. One general FGD group said that the landless and women are included in the committee and the WMCA activities are based on collective decision, so there is participation.

The WMCA further said that the LGED has designed and constructed the embankment, excavated the canals and built two sluice gates through consultation with the community and UP (WMCA). The LCS groups were engaged in the construction work. Hence there is participation.

Reality of participation in the polder

To the LCS group, there was participation to the extent that the WMCA EC comprises "local people". They indicated that there were landless and women in the first committee. But this group is unaware of who represent landless in the present committee. But they gave clear

opinion that the present committee is “not functioning well” and failed to give back our savings.

This statement of the LCS group and the prevailing conflicts concerning gate and canal grabbing imply that there is lack of participation and effectively the committee is elite-captured.

Gender

Role and status of women changed considerably since 2001-02 when the polder was constructed. In the formation stage of the WMCA, many women were included as WMCA members. WMCA women member met in the KII said that the WMCA had 40-50 women members at that time but now it is reduced to about 25 as learnt from the WMCA FGD. In the formation stage there were huge amount of construction work providing employment to 300 women from this village and neighboring villages taken together. Now there is not much work and women’s interest in the WMCA and the LCS declined as said by the LCS group. In the formation stage women members (like other members) deposited savings but they did not get the money back. In the formation stage women attended WMCA meetings now they are not joining meetings as men from their families attend and they do not feel it important to spend time there. It was also said that the women are not engaged in the construction woks. Actually there is not much work now so women’s employment opportunity in the LCS shrunk.

But women’s work opportunity in agriculture increased tremendously. In the pre-embankment period, the whole area was flooded, there was no grass and no crops, hence women spent idle time inside of the house and men went outside of the village for agricultural or other work. Now women work in agriculture from land preparation through weeding and harvesting to post harvest. Women cultivate vegetables, pulses, betel leaves and rear livestock. Thus they are contributing to increased household income. Women were also found producing bamboo crafts.

CO of LGED said that although they intend to engage poorest women from the locality to recruit in the LCS, this does not always happen and sometimes they have to compromise under the pressure of high level people like MP. Still, poor women are benefited by LCS work, like one Rahima whose son completed higher secondary education.

Women of Bagirabad were reported to be socially conscious and it seems correct as indicated by five women attending FGD with two men and all five were quite vocal although the facilitator and note taker were men.

The issue of wage discrimination came up in the discussion stating that woman gets Tk. 150/ day compared to man Tk. 250/day (reported by woman household head) for recruitment by contractor or private employers in agriculture and construction sectors etc. But in the case of LCS or NGO work wage was reported to be same.

Women gave a very different ranking of problems, while irrigation, siltation of canals and drainage were mentioned as most severe problems by men, women highlighted drinking water and irrigation as main problems. Drinking water because they fetch water by some from a distance of 500 meters and irrigation because their small pieces of land often cultivating non-rice crops in the highland area lack access to canals for irrigation.

9. CONCLUSION

Jainkathi Sub Project polder is located at village Bagirabad of Jainkathi Union Parishad, Patuakhali Sadar Upazila, Patuakhali. This is a very small polder with gross area of 32 ha. The polder is located only about 6 km south of Patuakhali town connected by a paved road where main transport modes are rickshaw, rickshaw van and battery operated auto rickshaw. Long distance transport modes beyond Patuakhali town are Bus and Motor Launch services. Short distance waterway transports are country boat and engine boat.

Bagirabad village area was left by BWDB when polders were constructed in the district in 1960s and later in 1980s. Therefore pressure of tide flow was very high and the area was inundated by tide water twice a day. Before 1980s local aus, aman and khesari were cultivated and people somehow survived with mainly three occupations, crop farming, cattle and buffalo rearing and fishing. Fishes were available abundantly.

After 1980s to 2001 pressure of water increased as the adjoining areas all were encircled by embankments and this small area had to take increased pressure. As a result only aman paddy could be grown and that too had very low yield, only about 10 mounds paddy per acre or 659 kg rice/ha. Cattle and buffalo rearing also declined as all land was flooded all the time, grass did not grow, there was no grazing area and cattle feed and fodder were scarce.

The LGED facilitated formation of the WMCA in 2000 and the organization was registered in 2001. The LGED constructed the polder including two sluice gates in 2001-02. This changed the scenario of the polder, the crop protection improved and cropping pattern changed. Besides local aman, HYV aman introduced. Boro was not produced in the area, HYV Boro was also introduced. In place of local aus, HYV aus came up. In addition to the rice crops, several other crops became important. Pulses, chili, sweet potato, vegetables, groundnut, sesame, cucumber, okra etc. expanded gradually in area and yield. People increased rearing cow. Aquaculture not yet commercial but started in the homestead ponds. One crop, betel leaves, became commercially important and small and marginal farmers too are cultivating it as it can be grown in small plots.

Aus and aman paddy are mainly rain-fed but also receive water from the canals. Vegetables, robi crops (pulses, water melon etc.) and vegetables need minor irrigation from canals or ponds, betel leaves are irrigated using the canals and HYV Boro is irrigated by low lift pumps taking water from the canals. A couple of low lift pumps provide irrigation service moving from one place to another on rotation basis.

The embankment condition is good in the west side as this is a paved road. Embankment condition is poor in the south and east where embankment height is low and width narrow because of poor maintenance. Erosion is not severe as there are no big rivers but the Chandanbaria canal in the monsoon high tides can damage the polder in the east and south.

Of the two gates, one is functional and the other one is closed. Of the three canals, the outer canal Chandanbaria is flowing but getting silted gradually. Of the two inner canals, Kalibari khal in the northwest is open but getting silted gradually. The other canal, Talukdarbari khal is closed by influential people and it is now under their control and is used for aquaculture, privately. There is no khas lease issue.

The LGED has handed over O&M responsibility to the WMCA in 2002 but still supports repair and re-excavation when funds are available. The LGED repaired embankment and re-excavated canals twice after cyclone Sidr and AILA in 2007 and 2009 respectively. The

LGED also provided yearly O&M support but the amounts were very low, highest Tk. 55,000 in 2006 and in 2008 it was only Tk. 15,000.

The LCS groups are inactive now as there is no ongoing work for them. The WMCA itself has become inactive and there is little or no allocation. Regular maintenance is lacking and the WMCA has no financial strength to do that. All are waiting for allocations from the LGED.

Internal resource mobilization is at mess as members feel that their savings have been lost, loans given could not be recovered hence loan giving stopped. There is no income generating activity hence no income to the WMCA.

To operate gate one WMCA member has been assigned responsibility but there is no incentive for him. It is seen as voluntary work but it is not really working. Probably the volunteerism means command from influential quarters and such command must be accompanied by tips.

Participation was low and seen vaguely. Having an EC comprised of “local people” including some “landless” and “women” in the WMCA were needed to fulfill the conditions but this did not really enhanced participation. Participation of LCS members were limited to “repair work” and for most, depositing savings (or also getting loan) but eventually not getting back savings (and not repaying loan). Now number of women members nearly halved and they too do not attend meeting as men from the households are there.

Main conflict in this polder is about low and high land. Interestingly, the poor generally have small pieces of highland while the rich have both high and low lands. Then conflict arises on the access to water for irrigation and drainage. The rich sees their interest and negates the needs of the poor.

The concerns expressed by the FGD participants include that the canals will be filled-up, there will be scarcity of water for irrigation and this will reduce crop yield. The LCS group says if it continues “we shall die in ten years time”. As remedial measures they suggested for:

1. Re-excavate canals
2. Construct new sluice gates
3. Provide irrigation pumps (STW/ LLP)
4. Provide more tube wells for drinking water, and
5. Repair embankment

As a remedy to conflict over access to sluice gates and canals, specific suggestions came to construct three more gates, one in the southeast as a substitute to Talukdarbari gate which is closed permanently. Another one is demanded in the north near Roybari as substitute to Shsarifbari (Kalibari) gate which is open but under control of Sharifbari and yet another one is demanded near Akbar’s shop, only a few steps from Sharifbari gate. But it is not said whether such gates will become private property of another Talukdar or Roy or Akbar. Surely some others will grab the new ones unless the organization is freed from elite capture.

A. ANNEX 1:

INSTITUTIONS IN WATER GOVERNANCE

This section introduces the main actors in the polder relevant to the multiple uses of water and the polder infrastructure. Water management is defined mainly by water for agriculture, including aquaculture, through operation, i.e. the opening and closing of sluice gates, and maintenance of the infrastructure (polder, gates and canals).

i) Government Agencies

Bangladesh Water Development Board (BWDB)

The Bangladesh Water Development Board (BWDB) is the main implementing agency of water infrastructure projects in Bangladesh. As per the National Water Policy (Ministry of Water Resources, 1999) it is responsible for polders larger than 1000 ha. For this purpose, BWDB has special wing in the district level headed by senior engineer called Executive Engineer (Operation and Maintenance).

Jainkathi Sub Project polder however do not belong the BWDB and they are not involved in its maintenance.

Local Government Engineering Department (LGED)

Jainkathi SP polder was constructed by the LGED and they are now responsible to maintain it in cooperation with the WMCA.

Union Parishad: Grassroots Local Government Institution

Rural governance in Bangladesh comprises of a three tier local government system of which Union Parishad is the grassroots local government institution and its immediate upper tier is UpazilaParishad. ZilaParishad is practically non-existent. The polder is under the jurisdiction of Naihati Union Parishad in RupshaUpazila, district Khulna. The UP is not involved in water management in this polder as the LGED is doing it. In this polder UP involvement did not appear prominently in the discussion even on conflict mitigation. UP is however involved in providing tube wells for drinking water and ring slab latrines for sanitation. UP has some involvement in minor repair of embankment particularly after disasters.

Role of UpazilaNirbahi Officer and District Committee/MP

The role of the upper level local government institutions of Upazilas and Districts is to coordinate between different government agencies and projects active in their areas. They are also to assist the Union Parishad for issues they cannot handle alone, as for instance funding required for various development activities (drinking water, emergency, roads maintenance) and coordination at the higher levels. Since the Polder falls in just one UP hence there is no issue of inter Union coordination by the UNO. The role of UNO did not come-up in the FGD and KII discussions. But UNO can play an important role to resolve conflict between the outsider leaseholder and local farmers on drainage, should local farmers seek his assistance. UNO role came up in the discussion regarding canal lease.

Department of Agricultural Extension (DAE)

The Department of Agricultural Extension (DAE) is responsible for the dissemination of agricultural technology, information and relevant services to farmers and other stakeholders down to village level. It is the largest department under the Ministry of Agriculture having their extension officer down to village level (one extension officer called Sub Assistant Agriculture Officer for a cluster of villages called Block). In the Sub Project area the participants did not mention of any assistance from the DAE. Despite located very close to the city, DAE officers may have very little interaction in the field level and the farmers may not find interest even to consult them. The DAE could help farmer to resolve shrimp-paddy conflict on drainage and irrigation access.

Department of Fisheries (DoF)

The Department of Fisheries (DoF) is responsible for the dissemination of fisheries resource conservation and aquaculture technology and is placed under the Ministry of Fisheries and Livestock. DoF provides training on fisheries and teaches how to do combined cultivation of paddy and fish. They provide support to fish cultivators in the area and assist them if there are any problems.

Department of Public Health Engineering (DPHE)

The Department of Public Health Engineering (DPHE) is the national lead agency for provision of drinking water supply and waste management throughout the rural areas. Drinking water was identified as the most important use of water, yet respondents were not able to give any information of interactions with the DPHE. Rather, they would contact the BRAC and Union Parishad and request for deep tube wells or piped water supply systems to access safe drinking water.

ii) NGOs

About nine NGOs, donor agencies and MFIs are working in the area. They are Grameen Bank (having a branch office in the village), BRAC (providing loan and agricultural inputs like Sunflower seeds), Padakhep, ASA, Manob Kolyan, Swanirvar, Save the Children and Danida. Danida provides support to agriculture, fisheries and livestock sub sectors and provided support for excavating canals, Save the Children provided support in Water Supply and Sanitation. All others provide loans. After Sidr and AILA, the NGOs provided humanitarian support, meaning relief.

Role of NGOs in water management: NGOs did not play any role in water management in the sub project area.

iii) Private actors:

Not active in this polder.

B. ANNEX 2: INSTITUTIONS

| Authority/ Organization | Concerned Ministry | Field Presence | Relevant Functions | Constraints | Suggested remedial measures |
|---|---|--|---|---|--|
| Upazila Bureaucracy: UNO office headed by the UNO | Ministry of Establishment | Up to Upazila level. | * General administration * Development coordination * Conflict resolution | * Inadequate manpower * Low skills of staff * Bureaucratic orientation * Lacks public accountability * Political interference | * Reorientation * Freedom to act professionally, neutrally, guided by law * Enhanced public accountability |
| Bangladesh Water Development Board (BWDB) Not involved in this polder | Ministry of Water Resources | Effectively up to district level | * Develop and maintain polder infrastructure * Implement national water policy in the field level | * Upazilla level office non- functional * Gateman recruitment stopped but alternative measure to O&M by communities not yet functioning effectively | * Repair, reconstruct polder * Transform BWDB from just line ministry control to a people oriented institution |
| Local Government Engineering Department (LGED) Main agency relevant to Sub Project | Ministry of Local Government Rural Development and Cooperatives | Up to Upazila level. | * Plan, implement and maintain rural infrastructure (rural roads, bridge, culvert market, ghatetc) * Plan and implement small water sector projects up to 1000 ha in cooperation with local bodies and communities * Provide technical support (design, supervision, accounting) to local government bodies to develop, operate and maintain local infrastructure) | * Inadequate manpower if no project on-going * Political interference | * Freedom to act professionally, neutrally, guided by law * Enhanced public accountability * Local government strengthening |
| Upazila Land Office headed by the Assistant Commissioner, Land | Ministry of Land | Up to Upazila and Union level. | * Khas land and khasjalmohal management * Leasing out of khas land, khasjalmohal | * Inadequate manpower * Low skills of staff * Bureaucratic orientation * Lacks public accountability * Political interference | * Reorientation * Freedom to act professionally, neutrally, guided by law * Enhanced public accountability |
| Department of Agriculture Extension (DAE) | Ministry of Agriculture | Effectively up to Upazila level. Officially multi village block level | * Provide technical advice * Assist distribution of input subsidies, agr loan etc. | * Sub Assistant Agriculture Officer rarely seen in the village/ UP * Low skills of employees * Political interference * Assigned many work by the government which are not related | * Establish Union based farmers information and service centre (FIAC) * Ensure presence of SAAOs at least in the UP on a regular basis * Ensure public accountability |

| Authority/ Organization | Concerned Ministry | Field Presence | Relevant Functions | Constraints | Suggested remedial measures |
|--|---|----------------------|--|---|--|
| | | below UP | | to agriculture sector | through reporting to UP and Upazila Chairmen & UNO |
| Department of Fisheries (DoF) | Ministry of Fisheries and Livestock | Up to Upazila level | <ul style="list-style-type: none"> * Provide technical advice to fish/shrimp farmers * Conserve fisheries resources * Inspect quality of shrimp fry supplied to farmers, * Promote hygienic condition of fish/shrimp landing centre/depots, quality of shrimp going to processing centre * Regulate shrimp farming so that it is not damaging environment * Khasjalmohal lease, management. * Report on fisheries/ shrimp area production etc | <ul style="list-style-type: none"> * Lack of manpower * Political interference * Lack transparency and public accountability | <ul style="list-style-type: none"> * Introduce local extension agent in fisheries (LEAF) as recommended by the Fourth Fisheries Project (as a community managed but government supported extension system) * Ensure public accountability where UAO and SAAO must report to Upazilla and UP chair respectively |
| Department of Public Health Engineering (DPHE) | Ministry of Local Government Rural Development and Cooperatives | Up to Upazila level. | Support water supply and sanitation <ul style="list-style-type: none"> - Tube Well - Pond sand filters - Rain water harvest - Ring slab latrine - piped water supply | <ul style="list-style-type: none"> * Political interference * Lack transparency and public accountability * Low coordination with other departments | <ul style="list-style-type: none"> * Inter agency coordination * Better interaction with the communities |
| Union Parishad (UP) | Ministry of Local Government | Nearest to people | 38 functions <ul style="list-style-type: none"> - provision and maintenance of rural infrastructure include roads, canals, dykes, small scale water management) - provision and maintenance of water supply sources - prevent contamination of water sources - village police - village court, salish | <ul style="list-style-type: none"> - Bureaucratic and political interference by DC/UNO and MP/minister -Lacks support of the government (financial & logistic) -Inability to mobilize financial resources internally - Elite domination | <ul style="list-style-type: none"> - Local government strengthening by the government - Government to support not control local government. - Involve civil society organizations/NGOs to buildup capacity of the UP and raise public awareness |