Government of the People's Republic of Bangladesh

Ministry of Irrigation, Water Development and Flood Control
Flood Plan Coordination Organization

BANGLADESH ACTION PLAN FOR FLOOD CONTROL

COMPARTMENTALIZATION PILOT PROJECT (FAP 20)

TANGAIL CPP INTERIM REPORT

ANNEX 1.3 : MULTI-DISCIPLINARY SUB-COMPARTMENTAL SURVEY
APPENDIX 4 : western PART : VOLUME 2
(SC. NO. 12, 13, 14, 15)

September 1992

Euroconsult/Lahmeyer International/Bangladesh Engineering & Technological Services/House of Consultants

under assignment to

DIRECTORAAT GENERAAL INTERNATIONALE SAMENWERKING
Government of the Netherlands

and

KREDITANSTALT FÜR WIEDERAUFBAU
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GENERALLY RELEVANT DATA

Rainfall and Drought

Sporadic rainfall begins in April, usually associated with North-Wester storms. Normal monsoon rainfall starts in June, continuing through July and August. Rainfall gradually becomes less and less frequent in September and October. There are variations from this usual pattern: sometimes heavy downpours early in May-June inundate the low lying farm land. Due to poor drainage condition this rainfall damages the standing crops e.g., mature Irri/Boro (sown late) and new B. Aman (*Chamara)* seedlings. This actually happened in 1991.

Once every few years there is heavy late monsoon rainfall in September and October, as was the case in 1991. This aggravates the drainage congestion problem in low lying areas, and T. Aman is damaged. Due to slow drainage, Rabi crops cultivation is delayed thereby delaying the subsequent Irri/Boro, which in turn is caught by the early monsoon flooding. In some low areas no Rabi crops can be cultivated due to unusual delay in the drainage, sometimes unto January and February, and thus non-availability of the land for sowing/planting. However late heavy showers in August-September are helpful for T. Aman in higher farm land. The rainfall in late December 1991 damaged some Rabi crops e.g. mustard, due to spoiled flowers and new planted potato due to compacted earth. But this rainfall was beneficial to wheat, cina and vegetables cultivation due to increased soil moisture.

Once every 3-4 years there is a drought problem. Drought in April, May causes damage to the Irri. These days the effect of drought is partly compensated for through the availability of water from DTW's and STW's, which are widespread in the Tangail CPP area.

However, in the higher farm land Aus and Jute are grown, where there are no irrigation facility available. In drought years there is widespread damage of these crops.

SUB-COMPARTMENT 12

12.1 INTRODUCTION

Sub-compartment 12 is on the western side of the *Tangail* CPP, beside the *Elanjani* river, a branch of *Dhaleswari* river. The earthen embankment-cum-road beside the *Elanjani* river from *Charabari* to *Baruha* bazaar is the western boundary of this sub-compartment. On the North lies the *Kagmari-Charabari* paved road, on the East is the *Kagmari-Silimpur* paved road and on the South is the *Berabusna-Baruha* bazaar paved road. The total area of this sub-compartment is about 1000 ha. The western part beside the embankment is a densely habitat area and the central and eastern part are mainly farm land, of which about 40% is low lying and affecting by drainage congestion.

12.2 HYDROLOGICAL SITUATION

RIVERFLOW: FLOODING AND DRAINAGE

The river flow begins in late May and enters the sub-compartment in June from the *Lohajang* river in the East through the *Santosh khal* and spreads over the entire area. Part of this intake flows east to *Kumaria khal* in SC-14 through the *Aloa Tarini khal.* A spillover flows south to SC-13 through the *Charpara* culvert. There is also flood intake through the *Bara Belta khal* and *Indro Belta khal* on the West from the *Elanjani* river. Due to the small sizes of the regulators, (1m x 1.30m box constructed in 1983-1984) their influence is comparatively less on the flooding of this area. During the peak monsoon period surface flood enters from the *Binnafur khal* (also known as *Ghoramara khal)* in SC-11 in the North through the *Santosh khal* flowing below *Santosh* bridge.

The early flood in June is caused largely by heavy rainfall in May-June, which cannot drain out due to silted up channels and the under-capacity regulators with high sill levels. The sub-compartment is basin shaped with a low central area and high surrounding areas. The main channels flowing to the rivers are *Santosh khal* to the *Lohajang* river, *Aloa Tarini khal* to *Kumaria beel* and then to the *Lohajang* river through *Deojan khal* in SC-14 via *Bara Belta* and *Indro Belta khals* to the *Elanjani*. During the high river stage these *khals* bring in flood water, filling the low basin, but they cannot drain out. The internal link channels are also silted up. These are sometimes blocked by roads constructed under FFW programme and in some locations converted into farm land by the adjacent land owners. At the moment (mid February 1992) about 20% of farm land of *Charapara, Sonhat* and *Aloa Bhabani* still is under more than 1m deep water. Most of this land cannot be cultivated this year for Irri crop. Late heavy rainfall last year and lack of drainage, due to silted *khals*, caused this problem.

Re-excavation of *Santosh khal* and *Aloa Tarini khal* upto the *Lohajang* river, *Barabelta khal* and *Indrobelta khal* upto the *Elanjani* river will relieve the drainage congestion. There is demand for the construction of a bigger regulator on *Barabelta khal,* since this *khal* commands a large catchment area. The *khal* should be excavated upto the low area. A few internal link canals will have to be excavated to connect the low pockets with the main *khals* e.g. *Katakhali khal* from *Santosh chak* to *Santosh khal,* 500m., *Charpara-Santosh chak* to *Aloa Tarini khal* 800m., *Sonhat chak* to *Barabelta khal* 500m, and the borrow pit beside the *Elasin* road from *Santosh* to *Aloa Tarini khal* 2km. There is also

demand for construction of a few culverts. The road from *Aloa Bhabani* to *Santosh* gets inundated in a normal monsoon and there is demand for improvement of this road.

There is strong popular resentment against the two regulators constructed on *Barabelta khal* and *Indrobelta khal*. The main reasons are inadequate discharge capacity and lost navigation facility. Some people say that the structures should be dismantled and bridges be constructed instead. Wooden fall-boards for use in the *Barabelta* regulator were reported stolen. There is a complain of improper operation of the regulators and local people are not fully aware and informed about the arrangement for their operation. *Barabelta khal, Indrobelta khal* and *Santosh khal* were re-excavated in 1978 - 1979.

Boat communication is not widespread during monsoon, because there is no entry from the rivers. Before closing the *Bara Belta* and *Indrobelta khals* plenty of boats of all sizes used to ply in this area. Now only small boats are used for internal movement of people and freight from house to house and to local markets.

There is no complain about any water hyacinth.

Erosion

The *Elanjani* river is eroding the embankment at *Barabelta* about 500m south of the regulator. The embankment was retired two years ago, but present embankment is now being threatened. People prefer river training or bank protection rather than retiring the embankment.

Ground Water

There are many DTW's and STW's in this sub-compartment. Ground water is adequately exploited, though there is limited scope for expansion. In some areas without electricity, some DTW's and STW's are not run due to the high cost of diesel and less return. Most of the people in the area drink HTW water, but there is a need and demand for more HTW's, specially in *Aloa Bhabani* and *Bara Belta*. There is no complain of any discharge problem from tube wells except in drought years.

Conclusion

The main water related problem in this sub-compartment is drainage congestion caused by silted up *khals*. The two small regulators on *Barabelta khal* and *Indrobelta khal* have aggravated this problem. *Barabelta khal* commands a large catchment area and there is demand for construction of a larger regulator with a low sill level. Re-excavation of the *Santosh khal, Aloa Tarini khal, Bara Belta khal* and *Indro Belta khal,* including a number of internal link channels, will relieve the drainage congestion.

Ground water resources are adequately exploited for irrigation by DTW's and STW's, but due to high cost of diesel some existing facilities are not used. More HTW's are required in some areas such as *Aloa Bhabani* and *Bara Belta*.

12.3 AGRICULTURE

The gross area of the sub-compartment SC-12 is approximately 1000 ha of which about 800 ha are net cultivated area. The major part of the area belongs to the F1 and F2 type. Some F0 and F3 types of land are also available in the area, occupying the village periphery and the basins respectively. The major cropping patterns and their land types are given below:

Crop Patterns				
Land Type	*Kharif*-1	*Kharif*-2	Rabi Annual	Approx. % of cultivated area
F0	B. Aus	-	Mustard/Wheat/Veg -	10%
F0	-	-	Pulse + Sugarcane	10%
F1 - F2	B.Aus/Jute	T.Aman	Mustard/Pulse/Potato/Wheat	20%
F2	Aus/B.Aman/	-	Boro (HYV) -	15%
F2	TDW Aman	-	Mustard,Boro(HYV)/Braus	15%
F2 - F3	TDW/B.Aman	-	Mustard/Wheat/Pulse	10%
F3	-	-	Boro (HYV)/Braus	20%

Average Crop Yield and Price

Farmers in the area reported the following average yield of their crops. They said that the price of their production varies in the area according to the demand. These are as follows:

Crops	Av. yield/ha.	Price/MT
B. Aus	1.60	5360-6030/-
T. Aman	2.70	5360-6030/-
TDW Aman/B.Aman	1.60	5360-6030/-
Boro (HYV)	5.00	6030/-
Braus	4.20	6030/-
Jute	1.70	4690/-
Wheat	2.40	5360-6432/-
Mustard	1.10	12060-13400/-
Potato	9.70	3210/-
Pulse (Lentil)	1.00	12730-13400/-
Sugarcane	32.00	650-670/-
Vegetable(Cabbage/Cauliflower)	13.80	3220/-

Use of Fertilizers

The method of application and doses of fertilizers are traditional. Due to lack of agricultural extension work in the area farmers use fertilizers in their fields following the instruction from their predecessors or neighbours. Farmers reported that they apply fertilizers in different crops in the following doses:

Crops	Urea(kg/ha)	TSP(kg/ha)	MP(kg/ha)
Aus	110-120	90-110	40-50
T. Aman	200-220	120-150	40-50
TDW/B.Aman	110-120	-	-
Boro(HYV)/Braus	240-260	160-180	50-60
Wheat	160-180	130-150	40-50
Mustard	120-150	100-120	40-50
Pulse	120-150	90-110	40-50
Potato	110-130	250-260	70-90
Vegetable	120-150	110-130	70-90
Sugarcane	160-180	200-220	60-80

Farmers expressed that they cannot supply more fertilizers due to lack credit. As the cost of other inputs are high, they cannot invest more to get higher yields from their fields. Among the insecticides they mostly use *Basudin, Dimicron, Nogos.*

Irrigated Crops

Farmers only irrigate the Irri or Boro (HYV) crops. Other crops in the area are grown under rainfed condition. The planting of TDW Aman is done on standing water with one or two ploughings and scavaties even without any ploughing. In the dry season DTWs and STWs irrigate HYV Boro or Braus. The DTWs are owned by KSS and all the STWs are privately owned by mostly medium and large farmers.

Village	DTWs/STWs (Cusec)	Irrigated Area (ha)
Kabilapara	DTW 1 No. (2 cusec)	20 ha.
Belta and	STW 20 Nos.(1/2 cusec)	100 ha.
Rakshit		
Kendua	STW 5 Nos. (1/2 cusec)	25 ha.
Sonhat	DTW 2 Nos. (2 cusec)	40 ha.
	STW 5 Nos. (1/2 cusec)	25 ha.
Santosh	DTW 2 Nos.	40 ha.
	STW 12 Nos.	65 ha.
Aloa Tarini	DTW 2 Nos.	40 ha.
	STW 4 Nos.	20 ha.
	53 Total :	375 ha.

Three DTWs are run by electricity and other DTW and STW are run by diesel. Farmers pay 1/4 of their production as the irrigation cost.

Share Cropping

It is learnt that about 20% of the farmers (medium and small) lease-in some land on a share cropping basis. Share croppers give 50% of the production to the owner. The land owner supplies only seeds and all other costs are incurred by share cropper.

Crop Damage

The major part of the area around villages *Belta* and *Belta Sarai* are not affected by flood as the land is of the F0 and F1-F2 type. Some low lying land is affected by water congestion, damaging B. Aus + B. Aman or TDW Aman due to early or late flooding. In the villages *Sonhat* and *Santosh* farmers reported partial damage of Boro (HYV) due to early flood. Aus + Aman (mixed) and TDW Aman is also considerably affected by water congestion. Farmers can obtain good yields of Aman when there is less flood.

The water logging condition in the low lying area exists for 4-5 months. In some areas water retain in the fields even in the dry season, causing late sowing of HYV Boro. In the village *Bara Basuria* a similar situation prevails, causing partial damage of Aus and Aman due to water congestion. Overall the main crop damage occurred in the medium low to low land due to water logging in the early and late monsoon. Farmers requested to re-excavate the *Belta* and *Santosh* khals in the area connecting then to the river *Elanjani* and *Lohajang* to drain out the congested water from the area.

Livestock

In the sub-compartment farmers use cows and bullocks as draft animals. The area faces a shortage in draft animals. Most of the medium and small farmers hire draft animals for land preparation. Each pair cost Tk.30-35/- for once ploughing a bigha of land. Farmers also use powertillers to plough their land at a rate of @ Tk. 3-4/- per decimal. But the number of powertillers is very low.

Almost all the cattle in the area belong to local varieties. Some rich and medium farmers have a few hybrid cattle. There is a artificial insemination centre in *Santosh* from where A.I. is given to farmers cows but farmers reported that this is less effective in some cases.

Rinderpest, throat sore, cow pox etc. are the common disease of the cattle. No epidemic was seen in the area for the last 2-3 years. Farmers reported acute livestock feed deficiency for 3-4 months in the rainy season. They purchase straw at @ Tk.50-60/- per mound to feed their cattle in this period.

Poultry

Poultry in the area are of local varieties. Among the poultry, chickens are in the majority, while ducks are available near the water source. Most of the chickens live on scavenging around the household and on fallow land. Chickens usually lay 15-20 eggs in a month while ducks lay 20-25 eggs per month. Farmers keep poultry in a small rooms made of earth. Some poultry feed is supplied by farmers like rice bran, wheat, pulse, residue etc. Ducks feed on snails, oysters etc. Ranikhet, fowl pox, tape worm etc. are the common diseases among the poultry. Farmers pay some incentives to the livestock staff for the treatment of their livestock and poultry.

Own Observation

Land types of the F0-F1 types occupy about 30% of the area where Aus, jute, T. Aman, Sugarcane etc. are grown. This land is situated mostly along the village periphery. F2 type land occupies the basin edges (almost 40%) where mixed Aus and Aman or TDW Aman, Boro (HYV) are grown. F3 type land occupies 20-30% of the area and is used only for growing HYV Boro (if water recedes earlier) and Braus (Late Boro) (if water recedes late).

There are now, mid february 1992, still some F3 type fields under water. Farmers reported that this land will remain fallow if the water does not recede within February. The land is very gently underlating to nearly level and slops to the South in the area of *Santosh* to the West in *Aloa Bhabani* and the North in the area of *Sonhat*. The overall slope of the land is south-east and towards the South.

Conclusion

Farmers in the area suffer from water congestion in the low lying area and they incur heavy loss due to inundation of Aus and B. Aman/TDW Aman due to early and late monsoon flood. Early flood, in some area, causes damage to mature Boro and the young seedlings of Aus and TDW/B. Aman. Re-excavation of some canals connecting the river *Elanjani* and *Lohajang* is requested by farmers to improve the drainage situation in the area.

Livestock shortage in the area is a big problem for farmers. They requested to arrange for free medicare for their livestock. Credit facility, with easy terms, would facilitate farmers to purchase draft animals and would help those farmers who now pay high cost for hiring draft animals or powertillers to plough their land. Farmers are interested in farm poultry but they cannot maintain them for the lack of knowledge.

12.4 FISHERIES

Fisheries Resources

Water Bodies

The water bodies under the SC-12 with their number, type, area and available fish species are shown below in the table:

Sl. No.	Water bodies	Number	Area (Acre)	Type	Available fish species	Annual	Ownership	Remarks
1.	Beel:	-	-	-	-	-	-	There is no perineal beel in the sub-compt. but flood plain fishery is there.
2.	Pagars: Bara Belta Rakshi Belta Sonhat Aloa Tarini	 2 7 1 1	Approx 3acres	Perineal	Minor carps,catfish,snake-heads, spinyeels,climbing perches, punti, tengra, pabda, boal.	150 mds approx.	Individual	Resourceful waterbodies
3.	Ponds: Bara Belta Porabari Rakshit Belta Sonhat Berabuchna	 1 10 2 3 3	16 acres approx	Perineal	Major carps, minor carps, Tilapia, nilotica, punti, etc.	Poor	Individual	Pond fish culture is not deve-loped in the area

Santosh Canal

This canal is a perineal water body which passes through the village *Santosh (Tangail Pauroshova)* and is known as *Santosh* canal. It originates from the *Lohajang* river, passes through *Santosh* village towards its western side and connects the flood plain of *Santosh, Charpara, Aloa Tarini, Chanhat, Belta* etc., *Rakshit Belta* through its branches. During the monsoon water enters from the *Lohajang* river into the canal and is distributed all over the surrounding *chaks*. The branch by which the main canal is connected with the *chaks* of *Aloa Tarini, Carpara, Sonhat, Bhabani* etc., dries up.

During the monsoon different types of fish from the nearby *Lohajang* river enter the *Santosh* canal and spread over the flood plain. This canal is the main source of flood plain fishery of the sub-compartment. There is also a report that fish enters the flood plain of the sub-compartment through the two canals of the village *Bara Belta* from the nearby *Elanjani* river, but fish migration through these two canals (*Bara Belta khals*) is reported to be very poor because a sluice gate controls water entry.

Professional Fishermen

There are about 40 households of professional fishermen in *Porabari* village, Union *Porabari* of Tangail Sadar Upazila. They live there since long and their socio-economic condition is very poor. These professional fishermen go fishing in the various ponds, *pagars*, ditches, flood plain and in the *Elanjani* river. They also go to the *Jamuna* for fishing. The fishermen are low cast Hindus. Almost all family members are engaged in their profession.

These fishermen sell their catch to the *Nikari* (muslim fish traders) and sometimes they sell fish directly in the market. During dull fishing periods they find it difficult to survive.

Fishing Periods

Fishing in the river and culture ponds goes on round the year, in the flood plain only during the monsoon in the *beels* and *pagars* only in the dry season. The months of October to February are reported to be the peak period for fishing.

Fishing Methods

In the river the professional fishermen catch fish by *Berjal, Kharjal* and *Dharmajal* and the percentage of this type of fishing in the area is about 1-2%.

During the monsoon, flood plain fishery is done by about 60-70% of the people which includes professional subsistence and occasional fishermen. They use *Castnets, Dharmajal* and some traps. (*Dhair, Darki, Ahuka, Hosa* etc.). Harpoons such as *Kouch, Eko, Tenta* are also reported to be used in flood plain fishery.

In the ponds and *pagars* fishing is done by both professional and subsistence fishermen (about 10-12%). Fishing in the *pagars* is done by drainage out the water using low lift irrigation pumps (LLP) and cast nets. Fishing in culture ponds is done by dragnets. Hand picking is also reported in shallow water in the dry season.

Flood Plain Fishery

Flood plain fishery is practised in the area. The inundation period varies from 4 to 6 months. During early monsoon the water starts entering from the river and at that time the flood plain is naturally stocked with different kinds of fish.

Professional, subsistence and occasional fishermen catch fish freely from the surrounding water. The month of May-June is reported to be the spawning period for fish in the flood

plain. In the post monsoon period the available fish in the flood plain migrate to the deep water bodies *(pagars)* while other fish spieces go back to river.

Institutional Facility

Institutional facilities are completely absent in the area. In some villages the people even do not know the existent of such fisheries institutional facility.

Fish Predation and Fish Diseases

Fish predation is reported. Predation is caused by *Shol, Boal, Aoir, Snakes, Frogs, Taki, Turtles* etc. Fish disease is very common in the area. About 90% of snakeheaded fishes, 60% of *punti*, 50% of *calisha*, and 1-2% of catfish are reported to be attacked with Epizootic Ulcerative Syndrome disease, as well as gill rotten and ectoparentoz disease. Fish disease is reported to be a serious concern. The fisheries production has fallen in the area due to intensity fish disease.

Fish Migration

Fish migrate to the flood plain of the sub-compartment from both the *Elanjani* and *Lohajang* river during the monsoon. The fish from *Elanjani* river migrate through the two canals of the village *Bara Belta* and from *Lohajang* river though the *Santosh* khal. The extent of migration of fish from the *Lohajang* river is more than that from the *Elanjani* river.

Own Observation

Water bodies like ponds, road side ditches, rivers *(Lohajang* and *Elanjani) pagars* and flood plain land were found. The *pagar* fish catch, though satisfactory, was found diseased (*Taki, Shol, Gazar, Punti, Cat fish* etc.). By completely drying the *pagars* over-fishing takes place and this will result in a decline the future fish production.

There is a very good perineal water body known as *Santosh khal* in the sub-compartment. This canal connects most of flood plain of the compartment. The branch of the canal which connects the flood plain of *Aloa Tarini, Sonhat, Bhabani* etc. was found dried up. The *Santosh* canal seems to be very useful to the villagers because the water of the canal is used by them for various domestic consumption, other than drinking. There are some ponds in the area. Some owners are culturing fish and some do not do it. Pond fish culture is very poor in the area. Some derelict ponds were also found. People seem to be interested in fish culture but due to financial problem they are unable to prepare ponds.

Conclusion

People in the area are interested in *beel* and pond fishery. They urged to expand the perineal water bodies like *pagars* and ponds. There is a great demand from the public to name more *pagars* in the low area of the flood plain so as to increase water bodies for fish retention. They also urged to re-excavate the branch of *Santosh* canal to facilitate fish migration from the *Lohajang* river to the flood plain of *Aloa Tarini* etc.

They urged to help them for preparing ponds in the area so as to boost up pond fish culture. They are very much worried about extensive fish disease. The professional fishermen discussed about their main problems like poverty due to which they cannot afford to purchase necessary inputs for fishery.

12.5 ENVIRONMENT-MALE

Biological

Arthropod

Destructive insect like *Nanda,Mazra, Changa, Chat, Grasshoper* etc. are reported. *Mazra* causes a lot of damage to paddy, *Nanda* causes damage to pulses, *Changa* causes damage to jute. Many other unidentified insect and pest are also reported. Crustacans like small palaemonid shrimps and crabs are present in the water bodies.

Mollusca

Fresh water muscles - *Lamellidiens* and snails including *pila* are reported. Snails are economically important since they are used as food for duck and other birds and are a source of lime. They are present in the water bodies.

Amphibian

Toad, Frog, Hyla are reported to be present both in water bodies and on soil. People in the area narrated that toad and frogs are very useful to them because they swallow many destructive insect in the agricultural field. Their population has significantly decreased in the area due to indiscriminate catching by a group of interested people. Toads have a market value and are sold in the market @ Tk.1/- per frog. Now this toad catching practice has decreased.

Reptiles

Reptiles like *Guishap,* Tortoise, *Lizard* and snakes, both poisonous and non-poisonous, are reported in the area. *Guishap* is dominant among the reptilian population and is useful as it kills snakes. The skin of the *Guishap* has much market value. Lizards are reported to swallow many insects. Tortoise population in the area has decreased.

Birds

Once the area was rich in bird population. Common birds like *Shalik, King fisher, Heron, Panikauri, Kora, Crow, Raven,Kite, Cuckoo, Bol, Pigeon, Dove* were present in good numbers 3/4 years back but their population has decreased. People reported that due to killing of birds by gun-fire and trapping, their population has been decreased. Some people reported that after the flood of 1988 their presence in the area has been decreased.

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Mammals

Terrestrial Wild Animals

The area is rich in significant plant vegetation and it provides good refuge for wild animals like *mongoose, jackle, bagdasha, bats, rats, jungle cats* etc. Rats are a serious problem in the area as they cause destruction to the food stuff and property.

Domestic Land Animals

Once the area was rich in domestic land animals but now, due to many reasons, their population is gradually decreasing. Buffalos and horses are almost absent. Cows and bulls are decreasing due to fodder scarcity and diseases. Cattle disease is reported in the area. Sheep and goats are present in personable numbers.

Others

Public Sanitation

Traditional latrines are present and used by the women. *Pucca* latrines are very few (about 10) and are owned by well-to-do people. Open sanitation is reported and is practical by children and men. The traditional latrines generate a very bad smell and pollute the air.

Afforestation

There is no report of planned afforestation by the Govt./Non-Govt. People do small scale afforestation programme in their homestead forest at their own initiation. In the rainy season they plant timber yielding trees like *Mehogony, Segun, Jack-fruit, Mango* etc. They also plant banana and other fruit yielding plants.

Deforestation

Deforestation is a common in the area. The fire wood is used in the brick-field. There are two brick-fields in the village *Gatergati* and *Santosh*. A lot of valuable trees are cut and is used in the brick-fields.

Human Activities

Agriculture

Agriculture is the main occupation of the people in the area though there is a report of other profession like fishing and weaving. Kitchen gardening is poor. Agricultural production is reported not to be satisfactory in the area due to natural factors like excessive rainfall and flood water.

Human Habitation

In the village *Sonhat* about 4/5 new houses covering an average area of 25-30 decimal were constructed over the last two years. This is common practice in the area due to increased population. The growth of new habitation is also reported in other areas but comparatively less than in *Sonhat*. Due to new habitation growth, agricultural land as well as homestead vegetation are gradually decreasing.

Pollution

People of *Sohnat* village reported skin disease like itching. In the paddy harvesting period when the farmers go to agricultural field to harvest the crops they suffer from itching due to the water in the fields. They reported that this itching might be due to use of insecticide. So water pollution is reported. In the monsoon, when they put jute in shallow water for retting, the water becomes polluted and this affects the fish. Air pollution caused by brick-fields and open sanitation.

Own Observation

Homestead forest is well developed, comprising common varieties of trees. Bamboo bushes are a significant vegetation in the area. Since there is a lack of sufficient surface water facility, the duck population finds it difficult to survive during dry season. Only a few ponds are found which are used for many domestic use other than drinking. The available tube wells, which ensure drinking water, seem to be sufficient in number. Many mehogony trees were found growing on either side of the public high road. Traditional latrines were found to be constructed in a very unplanned way and the same is a great environmental hazard. Bad smell from the latrine has polluted the environment and they are a source of many diseases. The two brick-fields were found functioning in the area and thus polluting the environment.

Conclusion

People are very much concerned about prevailing surface water scarcity, lack of sanitation facility, deforestation, rat menace, cattle disease, and pollution problems.

People in the area regreted to solve their acute surface water scarcity problem on priority basis. They urged to increase surface water by re-excavating homestead derelict ponds, *pagars* etc. to facilitate the domestic use of water other than drinking, to provide habitat for duck cultivation and also to facilitate irrigation for kitchen gardening, public baths and their cattle bathing. They requested to supply them quality vegetable seeds and saplings of timber yielding plants.

12.6 ENVIRONMENT-FEMALE

Homestead Forest

Homestead forest is reported to cover an average area of (.2 - .3) acres in each homestead In some parts homesteads have a dense tree cover, from a distance looking like a forest. The

homestead forest comprises the most common varieties of trees like herbs, shrubs, mango, banana, bamboo bush, jack-fruit, palm tree, jambura, berry, hard fruit trees, temarin, karai, shimul, goyeva etc. In between the different varieties of trees like types of animals like rats, mongoose, snake, varanas, mongoose, lizard. There are many types of flying birds habitats in the branches of trees. Many kitchen gardens are seen in the areas, having common varieties of vegetables.

Fuel

The main sources of fuel are jute stick, remains of sugarcane, paddy wheat, mustard, pulses, cow-dung, bushes, dried leaves of trees, water hyacinth and other garbases. Peoples from the poor section (who have no livestock and paddy field) are reported to face a serious scarcity of fuel.

Drinking Water

In areas like *Bara Belta, Kendua, Char Rakhit belta*, there are good number of hand pumps (about 100) which are the main source of drinking water. But in *Baniabari, Sonhat* the number of tube well is not sufficient (about 20). The villagers have to go for distance for drinking water. Sometimes people drink water from wells. Some (about 6-8) tube wells are supplied by different NGOs open quite some.

Sanitation

Sanitation is reported to be poor in the area. CARE have a program to supply some inputs for construction of *pucca* latrines in *Sonhat* village. There are a few *pucca* latrines in the rich households. Most of the people are using *kacha* (traditional) latrines.

Diseases

Diseases like Diarrhoea, Dyscentry, Malaria, Skin diseases occurr in the visited area. The people think that the main source of diseases is open sanitation. Always cocks, hens and fly are wandering in the open latrines. Most of the diseases occurred in the month of *Kartik*.

Rats

Rats are abundant in the visited area both inside and outside of the homesteads. They damage rice, wheat, other crops, fruits and also household belongings. There are other wild animals like, fox, *bagdasha, mongoose* and they kill baby goats and chickens.

12.7 SOCIO-ECONOMIC SITUATION (MALE)

Major Non-farm Activities

The major non-farm activities of the people in the surveyed area (*Bara Belta, Belta Paksit, Paniabandha, Aloa Bhabani, Aloa Tarini* and *Sonhat* village) are weaving, agricultural and non-agricultural works, service, petty and seasonal business, transportation and carpentry.

From the total non-farm households about two third of the households are engaged in weaving. From the rest one third about 55-60% covers day labourers, 20-25% covers transport workers 10-15% service holders, 5% petty and seasonal businessman and the remaining are involved in miscellaneous activities. There are about 400-500 landless families in the area, the majority of which live in *Bara Belta* and *Aloa Bhabani* village.

Social and Institutional Aspects

Employment Patterns

In the farm households mainly family labour is used, but the weaving households depend on hired labour. During the peak season of agriculture in the area, the use of hired labour is common.

As the area is dominated by the weaving industry. The daily labourer households tend to find their work primarily in the weaving industries. Those who do not find work in weaving and also not in agriculture move to Tangail town to look for work. These day labourers mainly engage themselves in transportation or in construction work. Some find work in nearby brick-fields or earth cutting. During the peak seasons of agriculture, the day labourers return to their respective villages and engage in agricultural work. Both in-migration of outside labourers (except for *Bara Belta* and *Paniabandha* village) and out-migration of local labourers are reported.

Wage Rates

The wage rate for agricultural labourers in the area are as follows:

Sl. No.	Village	Lean Season Wage/Peak Season				Remarks
		Tk.	Meal	Tk.	Meal	
1.	*Bara Belta*	20	-	20-25	two	Only during high peak season meal is provided.
2.	*Paniabanda*	20	-	20-25	two	
3.	*Belta Pakhit*	25	one	30-35	one	
4.	*Sonhat*	20	one	25-30	one	
5.	*Aloa-Bhafani*	20	one	25-30	one	
6.	*Aloa-Tarini*	20	one	30-35	one	

The wage of weaving industry workers depends on their individual skill and their production capacity. They can earn on an average Tk.40-50 without meal and Tk.25-30 with 3 meal per day. The carpenters earn @ Tk.50-60 with one meal for per day while rickshaw/van pullers can earn Tk.50-60 per day. The carpenters season has now become limited to 3/4 months from *Magh* to *Baisak*. They, therefore, now have to find their work in agriculture or even in transport their survival.

Organized Groups

In the surveyed area, the Grameen Bank, BURO, SDS and CARE have their organized groups of both male, female and children. Groups of the Grameen Bank have found in all the

villages while BURO and SDS groups have not yet formed of started functioning everywhere.

Transport and Communication

Except *Aloa Bhabani* all the villages in the surveyed area have good road communication system and the roads remain very much useable throughout the year. Rickshaw/van and tempoo can use the roads. The sub-compartment is bounded by *pucca* roads along its three sides and with the embankment at the other side which provides a great advantage to the people of the area to move into different places very easily.

Roads within *Aloa Bhabani* are very bad and the people of the area consider this as their main problem. The *Santosh khal* passes through the main road of the village that connects the *pucca* road of *Santosh*. But since there is no bridge over the *khal*, rickshaw/van cannot use the road even in the dry season. Moreover, the roads within the village get inundated during the rainy season and remain under water for 4/5 months. Then, except by using boats, people of this area cannot move to other places.

Markets

Three to four markets and bazaars are in and around the sub-compartment. These are: *Porabari hat, Baruha hat, Bhurbhuria hat* and *Santosh hat* (for details see other reports).

General Needs

In respect of education, health, communication and marketing the people of the area (except *Aloa Bhabani*) do not have many problems. The *Aloa Bhabani* people need a better road communication system for their village with a bridge over the *Santosh khal* at the entry point the village. The bridge, as viewed by the local people, will not only improve their road communication but also be beneficial to hundreds of traders, rickshaw/van pullers who live in the area.

Own Observation

Existing Water Related Situation

The *Paniabanda, Rakshit Belta* and *Rathbari chak* (almost in the central part of the sub-compartment) is affected by flooding each year and water remains there from *Ashar* to *Kartik*. This flood does not however cause damage to the crops in the fields on a regular basis and people of these area have no negative view about the flooding except when it comes earlier and quicker and causes damage to HYV Boro (during its harvesting) and or hampers B. Aus/Aman cultivation. Damage of HYV Boro and cultivation of B. Aus/Aman is caused mainly by rain water. *Aloa Bhabani* and *Aloa Tarini chaks* also have water logging problem. But the losses of crops due to the congestion problem or by flood in *Aloa Bhabani* is higher than it is in *Aloa Tarini*. The people of the *Aloa Bhabani* suffers most in performing their normal activities during the flooding time. The *chaks* on the eastern side of *Sonhat* village suffer drainage congestion problem, while the western side *chaks* need more water for agriculture.

The people are not happy with the (at *Bara Belta* and *Indro Belta*) sluices, as these structures, particularly the one in *Indro Belta* brought no help to them, but rather stopped navigation. The people of the area reported that they are not aware of any gate committee and its management is also not satisfactory, if not totally absent. It is also reported that all the fall boards (except two) of *Bara Belta* sluice gate been stolen and that the gate was totally open during the last monsoon.

Socio-Economic Situation

People of *Bara Belta, Sonhat* and *Aloa Tarini* villages are mainly engaged with weaving, while the majority of people from *Pania Bandha, Aloa Bhabani* and *Belta Rakshit* are engaged in agriculture. In respect of education the people involved in agriculture are a bit more advanced than those involved in weaving, but economically the weavers condition is much better here than the people with agriculture. It is learnt from the people of the area that the daily labourers prefer to work in the weaving industries for this sector provides more employment opportunity round the year as well as higher earnings. Sometime ago, when the weaving industry had its bad time, a lot of workers of this industry leatt the profession, but now with the positive change in this industry many who left have returned again and more are planning to join.

Peoples Opinion (about solving water related problem)

The people of *Sonat* suggested to re-excavate the *Bhurbhuria khal* in order to drain out the excess water of their *chak* on the eastern side. People of *Aloa Bhabani* and *Aloa Tarini* think that the *Santosh khal's* re-excavation will help solve their drainage congestion problem, particularly the flooding situation that prevails in *Aloa Bhabani* village and its surrounding areas during the monsoon.

The flood plain people think that the removal of sluice gates and construction of bridges will save their crops from flood damage and also restore navigation. The people from *Bara Belta* suggested that a sluice with more width and height to replace the *Bara Belta* sluice, and effective management would benefit people from both inside and outside.

Conclusion

The drainage congestion problem and the flooding in the area causes damage to the crops and sometimes inundates some homesteads and roads. These water related problems may be considered as the main hinderance for the smooth economic development of the people in the area.

12.8 SOCIO-ECONOMIC SITUATION (FEMALE)

Employment Patterns and Activities of Women

Women are mainly involved in household work. In the village *Bara Belta*, most of the women who have looks; are doing weaving work alongside their household work. Some of the women in this area are weaving professionally. Even young girls (aged 9-16) are doing

this work. This type of work is also found in *Char Rakhit Belta, Sonhat, Aloa Tarini*. A few women are engaged in service like family planning volunteers, FWA etc. There are many women (60-80) who are working in the paddy field (gathering seedlings), outside of their house, in *Santosh and Sonhat* village and they earn in cash. Duration of this work is 15-18 days. A few women in *Santosh* got training for sewing in the Islamic University *Suchi Shilpa Kendra*, and are now engaged in sewing. Some women in *Baniabari* village are making *Biri Thonga*. In almost in every village women are sewing cotton wrappers. Women (10-15) from the landless families find their earning through work in rich homes during and after the harvesting of paddy.

In the fishermen community in *Kendua* village, women are engaged in knitting nets throughout the year, besides their household works. They knit new nets and repair torn nets like, *Jhaki, Jal, Dharma Jal, Khora Jal, Suta Jal* etc.

A few women of the visited area, are engaged in work like Road Management Programme (RMP), BURO, Dai (trained from CARE).

Wage Rates

Women who weave earn Tk. 10-12 per day. Women *biri workers* earn Tk.6-7 per day. Women who are doing paddy work earn Tk.14-18 per 100 bundles of 140-150 young paddy plants. Cotton wrapper workers earn Tk.15-30 per wrapper. Sewing workers earn Tk.20-25 per day. But the earning is less in the lean season. The RMP, BURO Women workers earn Tk.550-1200 each month.

Education and Literacy

The literacy rate of the visited villages is shown in the following table:

Sl.No.	Village	Literacy Rate	Ratio of Boys	Ratio of Girls
1.	*Bara Belta*	15-20%	65%	35%
2.	*Kendua*	20-25%	55%	45%
3.	*Baniabari*	5-10%	75%	25%
4.	*Char Rakhit Belta*	15-18%	65%	35%
5.	*Sonhat*	18-22%	60%	40%
6.	*Santosh*	5-10%	65%	35%
7.	*Aloa Tarini*	5-8%	75%	25%

In *Bara Belta* village there are about 350-400 weaving machines. The school girls, especially in *Uttarpara* of this village, are engaged in weaving. They extended their helping hands for their family survival. A few girls (4-8) in the fisherman community, who are from rich fishermen households that have the ability to send their children to school, are going school. There are 45-50 fisherman households living in this village. But the parents of this village think that though their ability is insufficient, they want to send their children at school. But children do not want to go school. Parents think the reason is the poor quality of education.

There are some educational institutions in the villages or in the bordering villages. Communication is also good, though there are some problems in the rainy season in villages like *Santosh*.

Organized Groups

There are different organized groups such as local NGOs, BURO, CARE, Krishi Bank, SDS etc. in all the visited villages. The list of this organizations and groups are shown below:

Sl. No.	Village	Organization and Groups/Samity	No. of Groups with Member				Remarks
			No. of group	Male	No. of group	Female	
1.	Bara Belta	1. Grameen Bank	5	37	8	55	
		2. BURO	-	-	4	20	
		3. Bara Belta Uttarpara Samaj Kallan Club	01	42	-	-	
		4. Bara Belta Uttarpara Sonali Juba Shangha	01	40	-	-	
		5. Brothers Union Club	01	85	-	-	
2.	Kendua	1. Grameen Bank	5	30	5	35	
		2. SSS	-	-	5	25	
		3. Tarun Shangha	1	20	-	-	
		4. BURO	-	-	4	20	
3.	Baniabari	1. Grameen Bank	5	30	5	30	
		2. SSS	-	-	5	25	
		3. Tarun Shangha	1	20	-	-	
		4. SDS	1	15	1	10	
4.	Char Rakhit Belta	1. Grameen Bank	4	20	6	30	
		2. BURO	1	25	1	25	
		3. SDS	-	-	1	40	
		4. RMP	-	-	1	01	
		5. Rakhit Belta Juba Unnayan Shangha	1	30	-	-	
5.	Sonhat	1. Grameen Bank	6	30	5	25	
		2. CARE	-	-	6	30	
		3. SDS	1	30	1	30	
		4. BURO	2	20	2	20	
6.	Santosh	1. Grameen Bank	1	17	1	13	
		2. BURO	-	-	2	12	
7.	Aloa Tarini	1. Grameen Bank	1	8	-	-	

Public Facilities

Public facilities like Union Council Office, Post Office, FP Clinic, Health Clinic etc. are available around the area within two and three mile distance from the villages. But women of these villages think it is very hard to walk at long distance, especially in the rainy season, for receiving the service of family planning and EPI program. From some villages, there is a common complain against FWA, because women of the area do not get family planning materials in time.

Development Needs

The most commonly expressed need of all the visited villages is drinking water. The number of tubewells in *Baniabari, Santosh, Sonhat* are not sufficient. Women have to go a long distance for drinking water, washing, bathing etc. Medical facilities like livestock, children hospital are also needed. Women of these areas (*Sonhat, Aloa Tarini, Baniabari*) think that they have to go too far for treatment of their child and livestock. Women in *Baniabari* think

that if anytime fire breaks out in their locality, there will be a great problem, because there are no ponds in this area and there are only 3-4 tubewells.

Existing Water Related Situation

There is a sluice gate in *Bara belta* village. The women of this area told that due to this gate, water remains in many places of the canal especially in *Bhadra* month. In both side of the canal there are many traditional latrines and people drop dead, rotten things in this canal. The water flow of the gate at that time is also limited. So the dirt is not washed out. This causes a bad smell and mosquitos, flys etc. disturb the life of the people.

The women of this village also feel that due to this gate there is a great problem navigation. Before country boat and trade boats making the gate used upto *Karatia* with goods.

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SUB-COMPARTMENT 13

13.1 INTRODUCTION

Sub-compartment 13 is on the South-western corner of the *Tangail* CPP beside the *Elanjani* river. This triangular area is bounded by the *Tangail - Silimpur* paved road on the East, *Silimpur-Baruha* bazaar earthen embankment-cum-road beside the *Elanjani* river on the West and *Berabusna-Baruha* bazaar paved road in the North. The total area of this sub-compartment is about 420 ha. of which about 30% is low farm land lying in central part.

13.2 HYDROLOGICAL SITUATION

Riverflow: Flooding and Drainage

This sub-compartment has a number of isolated pockets fed by different sources of surface flooding. The *Charpara* area in the North is fed by overland flow from SC-12 through the culvert on the *Berabusna-Baruha* bazaar road. The farm land of *Baruha* and *Burburia* is surrounded by roads on all sides without any defined entry or exit. The *Baruha khal* passes through this part from the *Elanjani* river to the *Kumaria beel,* but it is closed at both ends. This area is flooded by rain water and later overland flow from the North and South which flows over the lower parts of the roads. Overland flow from the SC-14 enters this pocket at the peak monsoon through the pipe culvert on the main road near the *Gomjani* primary school. The southern farm land in *Mamudpur*, *Ganikishore* and *Rupsijatra* are flooded at the beginning through the *Mollabari beel* which is fed from *Atia-Kumaria beel,* and later through the *Rupsijatra khal* from the *Elanjani*. In the peak monsoon surface flood enters through the culvert near *Silimpur* bazaar and flows north through the culvert near the *Silimpur* High School. The *Silimpur* market is above normal flood level, but was under knee deep water in the 1988 flood.

Early flood in all these areas is caused by heavy showers in June and due to blocked channels this creates drainage congestion. River flood enters later in July during high river stages. Peak flood level is reached in August-September and in October drainage takes place. But drainage flow stops early due to the fact that the bed levels of the *khals* are higher than the farm land, leaving these areas water logged. Low pockets in *Baruha* and *Mamudpur* are now (Mid February 1992) still under knee deep water.

The southern part is drained out through the *Mollabari* (*Pirijpur*) *beel* to *Atia beel* in SC-14. One extra culvert near the *Silimpur* high school and excavation of a link channel from *Mamudpur* culvert to the *Mollabari beel* are required to facilitate timely drainage.

The *Baruha-Burburia chak* is severely congested. The *Baruha khal* is closed below the bridge on the embankment near *Baruha* high school. This was closed in 1989, because in 1988 flood, the heavy onrush of water damaged the homesteads and sand entry damaged farm land. The eastern end of the *khal* is blocked at *Bandabari* due to siltation and road construction. There is a request that this *khal* be re-excavated and opened at both ends, for proper drainage and entry of water can be effected when required. Improvement of *Baruha*

canal will benefit the entire sub-compartment after excavation of internal link canals up to this *khal*.

The *khal* at *Rupsijatra* brings in flood water from the *Elanjani* river during the peak monsoon and carries sand damaging adjacent farm land. There is strong local demand for closing this *khal*, which will also improve road communication.

Charpara area is drained out towards the North to SC-12. Improvement in drainage arrangement of SC-12 will also improve the drainage of *Charpara*.

The *Elanjani* river was re-excavated in 1978-1979 from *Charabari* to *Silimpur*. But it silted up to the same old level in the very next year.

Water hyacinth remains in the *beels* and *pagars* in the dry season. During the monsoon they multiply and spread out. Sometimes they create severe problem for Aman paddy when thick colonies spread among the paddy.

Boats are rare because there is no entry or exit route to the river. Only a few small boats are used for internal movements during the peak monsoon.

Erosion

The erosion at *Rupsijatra* has been going on for about 15 years. The old embankment was washed away in the 1988 flood and a retired embankment was constructed in 1989. The present embankment is also threatened and if no measure is taken it is likely to be breached next monsoon (1992).

In *Baruha* also the retired embankment was constructed in 1989 after the old embankment was washed away in the 1988 flood. But last monsoon erosion was less, and there seems to be no immediate threat.

Ground Water

According to the people there are adequate numbers of DTW's and STW's in this sub-compartment and ground water is adequately exploited. HTW's are used for drinking purposes, but their numbers are not enough. Some people drink water from open wells also as the nearest HTW is too far. There is demand for installing more HTW's in the area.

There is iron in the ground water but this does not pose any problem for drinking or irrigation. There is no complain about discharge in normal years but water discharge is less in drought years late in the dry season.

Conclusion

Low farm land area in this sub-compartment is comparatively less. The low pockets in *Baruha*, *Burburia* and *Mamudpur*, comprising about 30% of the farm land, are congested. Re-excavation of the *Baruha khal* from *Elanjani* to *Kumaria beel* will solve the drainage congestion area of this area. The *khal* at *Rupsijatra* is to be closed. The erosion problem at

Rupsijatra needs immediate attention. Ground water is adequately exploited for irrigation. There is demand for installing more HTW's.

13.3 AGRICULTURE

Cropping Pattern

The total gross area of the sub-compartment is approximately 420 ha. Out of this total area the net cultivated area is about 300 ha. The major crops grown in the area are Aus, Jute, T. Aman on medium high land, Aus and some crops along with sugarcane on high land and Boro (HYV) or Braus on medium high to medium low lands where irrigation facilities are available. Aus and Aman (mixed) or deep water Aman is grown mostly on low lying fields and subject to crop damage by flood in the monsoon. The following cropping patterns are in practice in the sub-compartment:

Crop Patterns			
Kharif-1	*Kharif*-2	Rabi	Approx. % of cultivated area
F0+F1 B.Aus/Jute	-	Wheat/Potato/Mustard/Pulse	20%
F1 B.Aus/Jute	T. Aman	Wheat/Pulse/Mustard	20%
F2 Aus+Aman	-	Mustard/Pulse/Potato/Wheat	10%
F2 TDW Aman/ B.Aman	-	Boro (HYV)/Braus	30%
F2+F3 -	-	Pulse/Veg+Sugarcane (Interculture)	10%
F2+F3 -	-	Boro (HYV)/Braus	10%

Apart from Boro (HYV), farmers do not grown any other HYV paddy. HYV wheat is mostly grown in the area are *Kanchan* and *Sonalika* while Irri-8, Boro-3,4 and Paizum are popular among the Boro (HYV).

Average Yield and Price

The average yield of different crops obtained by the farmers are moderate to poor as reported by farmers. Cropwise sale price of different crops at farmgate during the harvesting season are as follows:

Crops	Yield MT/HA	Price/MT
B. Aus	1.20	6164/-
T. Aman	1.60	6430/-
TDW Aman	1.70	6430/-
B. Aman	1.50	6430/-
Boro (HYV)	4.80	6430/-
Braus (late Boro)	3.90	6430/-
Jute	1.90	4690/-
Wheat	2.20	5628/-
Mustard	0.90	10720/-
Potato	8.00	3210/-
Pulse	1.50	12060/-
Sugarcane	36.00	3210/-

Use of Fertilizers

Traditional ways of application of fertilizers are followed in the area. Comparatively low doses of fertilizers are usually applied in T. Aman, Boro (HYV) and wheat. They reported that, although they know the benefit of use of optimum doses, they cannot afford higher doses for lack of credit as most of them are poor. Present quantity of fertilizers used in different crops are as follows:

Crops	Urea(kg/ha)	TSP(kg/ha)	MP(kg/ha)
Aus	150-190	100-110	50-60
T. Aman	220-250	150-170	50-60
Aus+Aman	150-160	-	-
Irri/Boro (HYV)	250-270	120-150	50-60
Wheat	240-250	130-150	40-50
Lentil	150-160	80-90	-
Sugarcane	190-200	150-170	70-80

To control the pest and insects farmers usually use *Basudin, Diagenin, Dircromine* in their Aus and Irri fields which cost Tk.40 per bottle and Tk.50-60 per kg (*Basudin*). Agricultural extension workers rarely visit the area. When necessary farmers take advice from rich farmer and occasionally from the agriculture office.

Share Cropper

In the sub-compartment about 40% of the farmers are involved in share-cropping. They are mainly small and medium farmers. Of the production 50% is received by the share cropper along with by-products. Owners of the land supply seeds or fertilizer in case of paddy. In case of rabi crops, share-cropper supply all inputs.

Irrigated Crops

About 30% of the area is under Boro (HYV) or Braus cultivation with ground water irrigation by DTWs and STWs. In the surveyed villagers 3 DTWs are available which are maintained through KSS. Each KSS consists of 40 to 45 members. All members and non-member farmers whose lands are irrigated contribute 1/4 of their production to the KSS and profit is distributed equally among the members.

Besides the DTW some privately owned STWs are available. STW owners take 1/4 of the production from the irrigated land. In the village *Guni Kishore*, where there is only one STW, the charge is however 1/3 of the production as the area irrigated by this STW is below the potential area. The available DTWs and STWs in the surveyed villages are as follows:

Village	DTWs/STWs (Cusec)	Irrigated Area (ha)
Baruha	DTW 1 No. (2 cusec)	22 ha.
	STW 8 Nos. (1/2 cusec)	40 ha.
Burburia	DTW 1 No. (2 cusec)	20 ha.
	STW 3 Nos. (1/2 cusec)	15 ha.
Mahmudpur	DTW 1 No. (2 cusec)	22 ha.
	STW 6 Nos. (1/2 cusec)	20 ha.
Rupsi Jatra	STW 6 Nos. (No function)	-
Guni Kishore	STW 1 No. (1/2 cusec)	4 ha.
	Total :	143 ha.

Crop Damage

Crop damage in the higher areas occurs by drought, pest and disease. Among these crops Aus, T. Aman, Jute and Mustard are affected due to attack with Caterpillar, *Mazra Poka*, Grass hopper etc. Mustard is also affected by rainfall at the flowering stage. Crops on medium low to low land are damaged due to early flooding in June, inundating the young seedlings of Aus and TDW/B. Aman. In 1988 people of the village *Baruha* closed the canal below the bridge near *Baruha* High School at the western part of the village to protect their crops and homesteads from the flood water of the *Elanjani* river. But water entering from the *Lohajang* river through *Gumjani khal* causes considerable damage to Aus and Aman crops in the area. Water remained in the lower area affecting growing of Rabi crops and Boro (HYV)/Irri.

Similar problems of water congestion are reported in the low lying area of *Mahmudpur, Burburia*. In the villages *Guni Kishore* and *Rupsi Jatra* this problem is not so acute. A different type of problem has been created in the village *Rupsi Jatra* and a part of *Mahmudpur*. During the devastating flood in 1988 high pressure of water from the river *Elanjani* made a big breach in the embankment and heavy siltation occurred in the area covering approximately 60-70 acres (as per report of farmers) with a thickness of 2-3 feet. Due to this sedimentation farmers cannot grow Boro (HYV) in the area which they could grown before the breach. At present this land is used for growing some Rabi crops with poor yield. The people of the sub-compartment demanded re-excavation of *Baruha-Madhyapara khal*. In *Mahmudpur* re-excavation of *Deojan khal* and in *Burburia* a small canal connecting the low area with the *Lohajang* river is requested by the farmers to remove water congestion from the area.

Livestock

Scarcity of livestock feed is acute in the rainy season when farmers mostly supply water hyacinth to their livestock along with some rice/wheat bran, oil cake, rice extract etc. No extra grazing facility is available in the area. Cattle mostly graze on fallow land, road sides and river banks. The general health situation is moderate to poor.

There is a livestock centre in *Gumjani* organized by *Milk Vita* from where farmers get some medicare and artificial insemination. It is reported that livestock assistants occasionally visit the area and give mass injection but in case of acute disease farmers pay some incentive for the treatment of their livestock. Farmers reported that occasionally the Union Parishad arranges to supply some medicine and medicare to their livestock. The area is deficient in draft animals. In the last two years there was considerable loss of cattle. Milch cows are used as draft animals. A few powertillers are in use in the sub-compartment but farmers reported high cost of ploughing. It costs @ Tk.4-5 per decimal per ploughing in place of Tk.1.50 per decimal per plough by draft animals.

Rinderpest, toe disease, throat sore, cow pox etc. are the common diseases among the cattle in the sub-compartment. Most of the farmers are inclined, in case of emergency, to get treatment of their cattle from private source due to non-availability of the veterenarian surgeon.

Poultry

Poultry in the area are of local varieties. Some farmers however tried to get HYV chickens but most of these died due to lack of proper feed and maintenance. So farmers avoid to keep this variety due to high cost. There is no poultry farm nearby. Some ducks are available in the households where water sources are available. Poultry mostly live on scavenging around the homesteads and ducks around the ditches and *pagars*.

Own Observation

The general slope of the land in the area is towards the South and East. The landscape is gently slopy to nearly level and of irregular relief. Soils along the river bank (levee) are light textured FSL to SIL and that in the basin edge and basin is SICL to SIC (finger test). The levee and village periphery are mostly F0-F1 type (about 40-50%) the basin edge soils belong to the F2 type (about 30%) and F3/F3+ (about 20-30%). In some low lying areas, water logging was observed, where the HYV Boro will be transplanted lately. Almost 50-60% of land is used for growing Rabi crops. Among the Rabi crops, wheat and mustard are prominent. Sugarcane is also grown in a considerable area in the sub-compartment.

Conclusion

Aus, Jute and T. Aman are grown on F0 and F1 type lands occupying about 40-50% of the area. Irri or Boro (HYV) is cultivated on about 30% of the area. Farmers are interested to grow more crops in the area but lack of irrigation facilities stops them from growing this HYV crop. In the North-western part of the *Baruha* village there is a good scope of growing Boro (HYV)/Braus. If farmers are provided with credit facilities they will go for growing Boro (HYV)/Braus in the area which now used for only Rabi crops of low yield. The drainage congestion should be improved with proper drainage system to expedite the farmers to grow HYV Boro in time so that they can obtain the maximum yield from this crop.

Mahmudpur

Farmers in *Mahmudpur* the area demand security of their land by strengthening the present embankment. If it is done they are ready to remove the sand deposited for their fields The livestock department should take proper measure to improve the present livestock and poultry situation in the area. Farmers prefer preventive measures to get rid off livestock and poultry disease rather than curative treatment.

13.4 FISHERIES

Water Bodies

The water bodies SC-13 with this number, type, area and available fish species are shown below in the table:

Sl. No.	Water bodies	Number	Area (Acre)	Type	Available fish species	Annual	Ownership	Remarks
1.	Beel	-	-	-	-	-	-	No perineal beel.
2.	Pagars: i. Baruha ii.Burburia iii.Mahmudpur	 3 3 4	3	Perineal	Snakeheads, Spinyeels, climbing perches, catfish, punti, calisha, boal,chela, chaplia, gabda, bele,shrimps etc. crabs. Fresh water muscles lamellidiens and snails including pia.	Approxi-mately 70-80 mds	Individual ownership	Pagars are perineal water bodies and are quali-tatively most res-ourcefulin the area.
2.	Pond	17	8 acres	cultured cultura-ble	Major carp, minor carps, Tilapia etc.	Poor	Individual ownership	Pond fish culture is not well practised but gradu-ally deve-loping.

Pagars

During the post monsoon period the flood plain fish naturally stocked in these *pagars*. In addition to fish, the *pagars* are also useful as a source of surface water irrigation to agricultural crops, for bathing etc.

Professional Fishermen

There are no professional fishermen in the sub-compartment. Professional fishermen from *Delduar* upazila *(Dewlia* Union) come to this area and catch. Fishing in the flood plain, river, *pagars* and ponds. This practice has been going on since long. These professional fishermen catch fish in the *pagars* and ponds on contract basis. The contract is such that sometimes the fishermen share 50% of the total fish catch and sometimes they work on cash payment basis.

Fishing Methods

Apart from recreational fishing method such as angling the following techniques and gear used by both professional and subsistence fishermen in the area are:

- Nets such as *Karentjal, Berjal, Kharjal, Dharmajal, Jakhijal, Fashal* and *Maijal.*
- Harpoons such as *Konch, Eko, Tenta* and *Aro.*
- Traps such as *Dhair, Darki, Ahuka, Hosa* and *Polo.*
- Lines such as *Chhip* and *Chhara.*
- Exclusive fishing of *pagars* and ditches in the dry season sometimes using low lift irrigation pumps. Hand picking in shallow water in dry season.

People in and around the catch fish in the flood plain by different techniques and they meet their fish consumption demand. Some poor people, after meeting their own fish consumption, sell fish in the market and earn some money.

Fisheries Practices

Both capture and culture fishery are in practice in the area. Capture fishery is more developed than culture fishery in the area.

Fish Predation and Fish Diseases

These two serious problem are reported to prevail in the area. Fish predators are frogs, turtles, lizards, snakes, king fishes, herons, cormovant and eagles etc. Fish predation is also a contributing factor for declination of fish population.

The major problem reported by both fishermen and the public is the occurrence of diseases like (*Epizootic Ulcerative Syndrome (Khoto Roge)*, gill rotten disease and ectoparasitic disease. Out of these the *Epizootic Ulcerative Syndrome* disease is reported to be extensive and is mainly affecting *Taki, Shole, Gajar, Punti, Tengra*. About 90% of these fish spieces are attacked with the disease. Shrimps are reported to be free from this disease.

Other Problems

Another problem for fishery in the area is the scarcity of brood fish due to exclusive fishing of pagars in the dry season. Moreover the mesh size of the nets used by the fishermen in the area, particularly the *Seize net, Berjal* etc. is very minute so the fishermen catch even undersize fishes.

Fish Migration

Migration of fish takes place in the area. In the monsoon different fresh water type of fish migrate from the rivers nearby to the flood plain by canal.

Own Observation

There are no perineal water bodies except some *pagars* in the flood plain under the sub-compartment. Pond fish culture is very poor and the number of excavated ponds are very few. Some derelict ponds were found.

About 90% of snake headed *fish, punti, tengra* etc. were found to be attacked with disease. Many dead fish bearing the mark of *epizootic ulcerative* disease was found floating in the water of the *pagars* and thus thereby causing water pollution. Many *toads, frogs, todpole, snails* and *heron* were found in the *pagars*. Some ducks were found grazing in the water of *pagars*. Small boys and adults were found fishing in the shallow water outside the *pagars*.

The canal connecting the flood plain of *Baruha* village (Union *Salimpur, Tangail Sadar upazila)* with *Elanjani* river was found to be blocked in many places. The water inside the canal was found to be seriously polluted.

Conclusion

People requested help to excavation new ponds as the number of existing ponds is very low. They urged to help them for pond fish culture in the area by providing all necessary facilitates like fish fry and training. They expressed their views that due to financial insolvency they are unable to excavate ponds in the area though they are interested. They are seriously concerned about existing fish diseases.

13.5 ENVIRONMENT

Biological

Annelida

Earthworm, leech any many other annelida are reported to be present in the area. Leeches are present both in water and bushes.

Arthropodal

Many insects like *Mazra poka, Pamri poka, Grass hopper* etc. are reported present in the area. They are destructive insect and cause a lot of damage to valuable agricultural crops. *Led pok* is also reported in the area. *Bicha* (local name) is also a destructive pest which damages jute.

Mollusca

The shellfishes which includes fresh water muscle lamellidiens marginalia and snail including *pila* globossa are present in the water bodies. Both the species have much food value for birds, duck and fishes. Moreover the shell of snail is used to prepare lime.

Amphibian

Toads, frogs, hyla etc. are present both in water bodies and in the nearby homestead bushes. These animals are economically important. Previously they would be caught by a particular group of people and sold to traders for export. This is now done muchless.

Reptiles

Reptilian animal like tortoise, lizard, snakes both poisonous and non-poisonous, varanus *(Guishap)* etc. are reported. The *Guishap* population is more abundant than others. *Guishap* is an important wealth as it kills poisonous snake and its skin is sold in the market at a higher price. The tortoise population is declining.

Birds

The common varieties of bird like *crow, raven, shalik, herons, dove, pigeons, king fishes, kite, eagle, cuckoo, owl* and aquatic bird like kora and panikori are reported. But the bird

population in general is gradually decreasing in the area due to unknown reasons. Migratory bird like *Bele duck, Kal-dighiri* visits the river during winter. Due to public interference, like hunting by gun and trapping, their numbers are now reducing.

Mammals

Terrestrial Wild Animals

Wild animals like Jackle, Mongoose, Jungle cats, *Bagdasha, Nangar*, Bats, Rats etc. are reported in the area. The number of Jackles are reported to have significantly decreased since the flood of 1988. *Mongoose* are abundant in the area. There is a serious rat problem in the area. They are causing a lot of damage to food stuff and property.

Domestic Land Animals

Domestic land animals are present but in reduced numbers. They include cows, dogs, horses, cats, buffalos, sheep and goats. The number of cattle has significantly decreased due to an out-break of disease. A good number of cattle (about 40) are reported to have died over the last 3 months due to an attack of an unknown disease. Moreover due to scarcity of cattle feed and fodder the people cannot afford to keep cattle. There is a scarcity of draft animals in the area and the people are seriously concerned over the issue. Many farmers could not farm part of their land last year due to an acute scarcity of draft animals.

Others

Afforestation

There is a report of a small scale afforestation programme in the area by forestry department. *Mehogony* and *Babla* trees are planted on either side of public roads. People plant trees on their homesteads there are many Bamboo bushes in the area.

Deforestation

Deforestation goes on in the area. Trees are sold by the owner to traders. They purchase trees like *Shimul, Mango, Chatain, Kathal* etc. which are used for both timber and fire-wood. Brick-field owners from neighbouring areas buy wood from the area.

Human Habitation

New human habitation develops in the area. About 2/3 houses, covering an average area of 40 decimal, have been constructed last year. This practice is reported to be going on since long and as a result the homestead forest and agricultural land is gradually decreasing.

Use of Insecticide and Pesticides

Insecticides like *Bashudin, Furadon, Diazin, Dimacron* are used to protect crops from the attack of pest and destructive insect. Dye and chemicals around in the weaving industry.

Pollution

Both air and water pollution is reported to exist in the area. The silted up canal emerging from the *Elanjani* river and passing through the South *para* of *Baruha* village (Union *Selimpur*), and connecting the *chak* is a serious health hazard in the area. The mouth of the said canal has been blocked by the public of the village and as a result the fllishing of the khal by water has been stopped. The stagnant water is much polluted. People live on both sides of the canal and they have constructed traditional latrines along the canal. Open sanitation and leaving dead animals here and there. Create a serious health hazard in the area.

Own Observation

There is significant natural vegetation. Homestead forest is well developed including common varieties herbs, shrubs and trees. Bamboo bushes are abundant in the area and are economically important. The homestead forest provides an excellent refuge for wild animals. Wild animals like mongoose, guishap and many rodents were also seen inside the bush.

Road side ditches and small derelict ponds were found dried up and there is a acute scarcity of surface water for domestic use, other than drinking. Hand pumps are there though not many, but they can more or less meet the demand of drinking water in the area. There are many *kacha* latrines, but very few *pucca* latrines. The dead canal in *Baruha* village is a serious health hazard due to water pollution. The cattle population is poor in the area. The transportation system is not so developed and only a few cycles, van rickshaws and carts were noticed.

Conclusion

People requested construction of water reservoirs in the area as there is a acute scarcity of surface water during dry season. People told that they are unable to re-excavate the existing homestead ditches due to poverty. So they, urged to re-excavate the existing dried ditches for more water retention to ensure future domestic use during winter. They also appealed for more hand pumps as the existing pumps are not sufficient. They requested quality seed supply in order to enable them to boost up vegetation growth. They also urged to supply them the saplings of timber yielding plants like *Mehogony, Segun* and *Jack-fruit* etc. They approached to remove the stagnant water of the *Baruha* dead canal as it is a serious health hazard.

13.6 SOCIO-ECONOMIC SITUATION - MALE

Major Non-Farm Activities

The people of the surveyed area (*Baruha, Bhurbhuria, Ghuni Kishore, Ruposi Jatra* and *Mamudpur*) are engaged in different non-farm activities. Services make up 20-25%, daily labourers 40-45%, weavers 10-15%, seasonal/petty businessman 12-15%, transport workers 5%, cane workers (mat producer) 5% etc. The service holders are mainly from *Mamudpur* (about 30-35%), *Baruha* (25-30%), *Ruposi* (20-25%) and *Bhurbhuria* (15-20%). The weavers

are mainly concentrated in *Baruha* (50%), *Mamudpur* (20-25%), *Ghuni Kishore* (15-20%) villages. Daily labourers are mainly from *Ghuni Kishore* (about 50-55%), *Baruha* (25-30%), *Bhurbhuria* and *Ruposi Jatra* (20-25%). The number of landless families are highest in *Guni Kishore* village (about 60-65%), followed by *Baruha, Mamudpur* and *Bhurbhuria* (20-25% in each village) and *Ruposi Jatra* (10-15%).

Social and Institutional Aspects

Employment Patterns

Mainly family labour is used in the farm households except for sowing and harvesting of Boro (HYV) paddy and during harvesting of sugarcane. During the lean season for agricultural work, the day labourers of the area migrate to other places on a regular basis and in groups to find work. Mostly they engage in agricultural work in other areas while others are engaged in non-agricultural work like rickshaw/van pulling, construction work etc. in *Tangail* town. Some day labourers also find work in Dhaka.

Labourers from outside the area also come into this area during the time of HYV Boro and sugarcane harvesting.

Wage Rates

The wage rate for the daily labourers in the whole sub-compartment is almost the same. The ranges is from Tk. 15-20 in the lean season to Tk.20-25 in the peak season with two meal. Only during harvesting of sugarcane the rate goes up slightly and three meals are provided at that time as the labourers at that time work day and night. Mainly outside workers do this day and night work during harvesting sugarcane. The wage rate for the students engaged in agricultural work is Tk.4.00 per decimal planting seedlings and Tk.10.00 for harvesting (mainly HYV Boro) the same amount of land.

Organized Groups

In the sub-compartment there are quite a few organized groups of different NGOs - like Grameen Bank, BURO and SDS. The BRDB has two KSS groups in the area. The NGO's have their groups/samities (for male, female and children) in almost all the villages in the sub-compartment, while KSS groups are found in *Mamudpur* and *Burburia*. There is a club of young people in *Mamudpur* named *MAMUDPUR-KUCHIAMARI SAMAJ SEBA SANGHO*. The club has been founded a few years back and the welfare of the society is there main objective. It is learnt from one of the organizer of the club that the club members took part in repairing some parts of the embankment/road which was damaged by incessant rainfall last year. The club members also provide night watch services in the villages on a regular basis. The club has now 75 members who are mainly students.

Transport and Communication

Almost all the villages of this sub-compartment are situated either on the side of the embankment or on the side of *pucca* roads. Therefore, the road communication with the outside area is very good.

The internal village roads in some villages are however not that high and during the monsoon these roads (particularly in *Burburia* and some parts of *Baruha*) go under water. These areas are mainly low-lying areas and due to water congestion problem the village roads get inundated. The situation however, remains so only for few days during the monsoon. Tempoo, Rickshaws and Vans can use the roads in the area throughout year including the village roads except during the peak monsoon.

Markets

There are two big and important markets within the sub-compartment and a small market nearby. The people of the sub-compartment have no problem regarding marketing. The markets are *Baruha*, *Silimpur* and *Burburia*. *Baruha* and *Silimpur* markets have daily bazaars.

Own Observation

Existing Water Related Situation

The central part of the sub-compartment and also some parts of its North-eastern side have some low-lying area where water logging occurs during the monsoon. These areas suffer from drainage congestion and there HYV Boro is the only crop grow, with some coverage of mixed Aus and Aman. The western and southern area are of higher elevation and water congestion does not affect these areas. On an average two crops can grow there.

On the other hand, some areas of the north-western part suffer from shortage of water during HYV Boro cultivation mainly because of inadequate irrigation facilities in the area. The low lying area are inundated both by rain water and riverine flood water from the *Lohajang* river via *Atia-Kumaria beel*. The area in-between the *Elanjani* river and the embankment on the western side of the sub-compartment do not suffer drainage congestion problems or have much negative flooding effect except when the river over tops the embankment. The water remains around the homestead for 10-15 days during full monsoon.

A *khal* from the *Elanjani* through the embankment towards *Ghunikishore* village (in the most southern part of the sub-compartment) also causes flooding and inundates the homesteads (as happened this year) in the area surrounding *Gunikishore*. The water remains in the homesteads in this area for about one month and caused damaged to the courtyards of some of the houses. There is another source of flooding in the area through the *Goujani khal* from the *Lohajang* via *Kumaria-Atia beel*, but that is beneficial for the agriculture of the area.

Socio-Economic Situation

The people of the western part of the sub-compartment (from *Baruha Mamudpur and Rupsi Jatra*) are more advanced both educationally and economically than the people in the southern and North-eastern part (from *Guni Kishore* and *Burburia*).

The economic condition of *Baruha, Rupsijatra* and *Burburia* are similar. The economic condition of the people of *Rupsijatra* and that of *Guni Kishore* was much better before the 1988 flood than now. The flood of 1988 caused great damage to their agricultural land by

sand deposit, which reduced the fertility of the land and stopped the production of HYV Boro crop of the area. Meanwhile, they planned to de-silt their land, but as the part of the embankment (which was washed away during the 1988 flood) is not secure yet and may cause siltation by breaching again, they are afraid to go for de-siltation of their land. Now their economic development greatly depends on a secured embankment for which they are waiting for the last four years.

Students of the area, particularly of *Baruha* and *Mamudpur* have been found engaged in agricultural works during their off days. They thus meet part of their educational expenses which is a new trend in the area. The system of payment of wage to them is also a bit different from the normal practice. They are paid on the basis of the number of decimals of land that they worked. They do so mainly during the sowing and harvesting of HYV paddy and during harvesting of wheat.

Peoples Opinion (about solving water related problem)

To remove the drainage congestion problem (in the central part and North-eastern part) of the sub-compartment the people of the area suggested to re-excavate the *Bhurbhuria* and *Goujani khal* up to the southern end of *Kumaria-Atia beel* and then re-excavation of *Deojan khal* (connecting the *Kumaria-Atia beel* in one side and the *Lohajang* river on the other side). The people from other parts of the sub-compartment also feel the necessity of re-excavation of the *Deojan khal* as well as *Goujani* and *Burburia khals* to remove the drainage congestion problem of the area.

To check the damage of flooding via the *khal* from the *Elenjani* to *Goni Kishore*, in the southern part of the sub-compartment, the people of the area expressed the unanimous need to close the *khal* or to block it by the embankment as the *khal* provides no benefit to them rather than losses.

Conclusion

To remove the water logging and drainage congestion problem of the area, the *Burburia* and *Gomjani khal* inside the sub-compartment and *Deojan khal* need to be re-excavated. This will stimulate the economic development of the area. Measures should also to be taken for de-siltation of the land in the area including the re-sectioning and strengthening of the embankment in the *Rupsijatra* part to provide economic and social security for people in the area.

13.7 SOCIO-ECONOMIC SITUATION - FEMALE

Employment Patterns

Women of *Baruha, Bhurbhuria, Mahmudpur, Rupsijatra, Guni Kishore* are mainly involved in household work. Women in this area are not involved in any activities in the field. There are 10-15 women who are engaged in sewing, 20-25 women are doing fine mat work, 10-15 are busy with cane work, 20-25 women are engaged with weaving and 5-7 are preparing *Thonga* professionally in *Baruha* village. A few women work in family planning in *Baruha*

and *Mahmudpur* village. There are 3 women who are teaching in a primary school and 2 in a high school in *Mahmudpur* village. There are also 3 women who are working as - maid and 10-12 women are service holder in the *Baruha* village.

Some women from poor households are engage in post harvesting activities in homes of rich neighbours. There are 15-20 women in the surveyed area, sewing cotton wrapper (katha) and 5-8 women are knitting nets. In *Mahmudpur* village there are about 95 women who are professional fine mat makers. These family are locally called *Paitta*. Once this work was scheduled only for Hindu families. Now this type of work is also done in Muslim families, particularly in poor families. Female workers of Muslim family makie fine mats on a contract basis for the *Paitta*. The *Paitta* supply them with the raw materials.

Wage Rate

Sewing workers sometimes earn Tk.8-10 per day but most of the time they earn Tk.5-10. *Thonga* workers earn Tk.5-6 per day. The rate of fine mats varies according to the quality of mat. Some of the expert fine mat workers earn Tk.150-200 for each mat and it takes 3 to 4 days time to finish a mat. On the other hand, the contract mat workers earn Tk. 10-15 for each mat. It takes about 2 days time to finish one of these. Family planning workers earn Tk. 550 per month. Cotton wrapper *(katha)* workers earn Tk.15-30 for each *katha* but the rate varies with the season. Service holders and teachers earn more depending on their salary scale.

Literacy Rate

The literacy rate in *Baruha* village is more than 35%. It is about 15-20% in *Burburia*, 20-25% in *Mahmudpur*, 10-15% in *Rupshi Jatra*, 10-12% in *Guni Kishore* village. The ratio of enrolment of students in the *Baruha* village is 50% boys and 50% girls. This village is enjoining every educational facility having 2 primary schools, 1 boys high school, 1 girls high school and 2 madrasas.

The ratio of enrolment of students in *Burburia* village is 60% boys and 40% girls, in *Mahmudpur* village the ratio is 65% boys and 35% girls, in *Rupsijatra*, the ratio is 70% boys and 30% girls, while in *Guni Kishore*, the ratio is 65% boys and 35% girls. The educational facilities of these villages are sufficient. Most of the institutes are near the bordering villages and though it takes time, they are easy to get to.

Organized Groups

NGO, Semi Govt. organizations, autonomous activities are found in more or less all villages. The following table represents the information about the organizations with their activities:

Sl. No.	Name of the village, Union Upazila	Name of the (NGO/ Semi Govt./Autono-mous) organization	No. of		No. of		Main Activities of the organizations	Identification of the area incharge/super-sors of the organizations	Remarks
			Female	Male	Female	Male			
1.	Baruha Silimpur Tangail Sadar	Grameen Bank	04	02	130	60	a)Savings and loan for I.G. activities b)Literacy program c)Homestead gardening d)MCH-FP (e)Poultry (f)Raising sewing	Not known	
		FPAB	01	-	05	-	(a)MCH-FP	"	
		SDS	01	01	20	25	(a)Savings (b)Literacy program (c)Distributing medical facilities	"	
		CARE	02	-	02	-	(a)Vaccination	"	
		Ashar Samity	01	-	30	-	(a)Savings and loan for I.G. activities among members	"	
		Tarun Tej Club	-	01	-	35+	(a)Savings (b)Social work	"	
		Dakhin Para Shebak Songha	-	01	-	40+	(a)Savings (b)Social work	"	
2.	Bhurbhuria Atia,Delduar	BURU	03	-	30	-	(a)Savings	"	
		SDS	01	01	10	15	(a)Savings (b)Medical facilities	"	
		Grameen Bank	02	01	50+	19	(a)Savings loan for I.G. activities	"	
		Social Welfare Samity	01	-	15+	-	(a)Sewing	"	Just started
		BRDB	-	01 KSS	-	35	(a)Group formation (b)Providing loan to the farmers (c)Training on improved agricultural methods (d)Program of DTW	"	
3.	Mahmudpur Atia,Delduar	BURO	01	-	50	-	(a)Savings & loan for I.G. activities (b)Literacy program (c)Physical exercise		
		CARE	01	-	01	-	(a)Vaccination	Rong Bahar	
		FPAB	01	-	05	-	(a)MCH-FP	Rong Bahar	
		SDS	01	01	20	25	(a)Savings (b)Medicine & Book distribution	Not known	
		Grameen Bank	05	05	25	25+	(a)Savings & loan distribution (b)Literacy program (c)Distributing Sanitary	"	
4.	Rupashi Jatra Silimpur Tangail Sadar	BURO	05	-	25	-	as mentioned above	"	
		Grameen Bank	04	03	20	15	as mentioned above	"	
		SDS	01	01	20	20	as mentioned above	"	

Sl. No.	Name of the village, Union Upazila	Name of the (NGO/ Semi Govt./Autono-mous) organization	No. of		No. of		Main Activities of the organizations	Identification of the area incharge/super-sors of the organizations	Remarks
			Female	Male	Female	Male			
5.	Ghunikishore Atia,Delduar	Grameen Bank	03	02	27	18	as mentioned above	Not known	
		CARE	01	-	30	-	(a)Savings & loan for I.G. activities (b)Literacy program (c)Training health care and sanitation (d)Homestead gardening (e)Poultry farming (f)Vaccination		
		SDS	01	01	10	15	(a)Savings (b)Training on health care & sanitation (c)Medicine and book distribution		

Public Facilities

Public facilities are more or less available within an acceptable distance, but in some respects, as F.P. clinic, health clinic/centres, women would prefer facilities closer by.

Development Needs

In *Mahmudpur* and *Rupashi Jatra*, the girls students have requested a girls high school in their own locality. They say that most of the drop out of girls occurs after primary level. If there were a girls high school near by, parents would send their grown up daughters to school. During the rainy season the girl students face problems on the muddy roads, on the way to school.

The villagers of *Ghuni Kishore* have to go to *Atia* for medical facilities. Communication and transport are not good in this direction. So, people prefer to go to Tangail rather than *Atia*. In some areas like *Ghuni Kishore*, *Rupsijatra*, *Mahmudpur* there is a serious scarcity of drinking water. Women have to go far for drinking water. They know about the activities of CARE, Grameen Bank. They say that if these organizations distribute tube wells by instalment, it will be a great help for them.

Existing Water Related Situation

Women of *Mahmudpur, (Rupashi Jatra)*, who have no pond or tube wells, usually go to the abyss of the river *Elanjani* for bathing. During *Chaitra* month, the water level of the abyss has decreased to such a low level that they have to bath by taking water with a glass. Livestock, men, women and children all use this abyss. During *Falgun-Chaitra* the water quality is bad. By using this water people develop irrigated eyes and skin.

There is an embankment near the village of *Rupsahi Jatra, Mahmudpur*. There are borrowpits on both side of the embankment. During the rainy season, rain water fills the

borrowpits. People farmers use this water to ret jute. Flies and bad smell from jute retting disturbs the people.

In *Dhakhin para* of *Baruha* village, there is a canal, but the month of the canal is now totally closed. On both sides of the canal, there are many traditional latrines. People also used this canal as garbage dump. In many places, throughout the year, there is serious water congestion. Due to this dirty water, the number of flies increased and sometimes malaria occurs. During the rainy season, due to the fact that the mouth of the canal is closed, water could not drain away and overflows the residences on both sides with dirty water.

SUB-COMPARTMENT 14

14.1 INTRODUCTION

Sub-compartment 14 is on the southern periphery of the *Tangail*-CPP. This area is almost triangular in shape and is bounded by the *Tangail-Elasin* paved road on the West, *Karatia-Silimpur* earthen road on the South, *Pathrail-Kagmari* earthen embankment along the *Lohajang* river on the North and North-East. The total area of this sub-compartment is about 1140 ha. In the southern part about 50% of the farm land is low, while in the northern part about 30% area is low and affected by drainage congestion. The long *Atia-Kumaria beel* is extended North-South from *Chinakhola* to *Atia* almost through the middle of the sub-compartment dividing it into one eastern and one western part. This *beel* largely commands the surface flow in this area.

14.2 HYDROLOGICAL SITUATION

River Flow: Flooding and Drainage

The early flood starts in June and the main source is rainfall. River water from the *Lohajang* river enters this sub-compartment through the *Deojan khal* at the beginning and later through the *Aloa-Tarini khal*, both filling the *Atia-Kumaria beel*. During the peak monsoon, flood water enters from the South through *Pirijpur beel*, coming from SC-13.

The surface water flows from the North to South during the monsoon period. The major flow takes place through the *Atia-Kumaria beel* and discharges to *Nanduria beel* in SC-E6 through the *Thanar khal* and through the *Chala Atia khal*. The other part flows through *Mangalhar khal*, passing through *Dasaiga* and then again to SC-E6. A small flow enters *Dasaknia* at the South-East from SC-15 in the South-West corner through two box culverts on the *Pathrail-Delduar* road and also flows out to SC-E6.

During the late monsoon, in addition to the southern flow, part of the drainage takes place through the *Deojan khal* in the North to the *Lohajang* river and another part through the *Aloa-Tarini khal*. All these *khals* in the North and South are silted up and drainage through them stops by early October leaving the low lands full of water and congested. These areas dry up by evaporation only and some areas remain waterlogged till February (1992). The southern area i.e. *Dasaiga, Atia* and *Dasaknia* suffer more due to drainage congestion since the drainage through the northern *khals* stop early and the southern *khals* and openings are inadequate compared with the drainage requirement. There is complain that the culvert under construction at *Dosaiga* is of inadequate span and that the alignment is wrong which will aggravate the drainage congestion.

Construction of internal earthen roads through the FFW programme has contributed largely to the drainage congestion problem. In some places these roads crossed channels without any bridge or culvert i.e. being constructed the *Bandabari-Kumaria* road has blocked the flow through the *Baruha khal*. In some other places these roads were constructed along an existing channel, narrowing and obstructing the channel section and flow, sometimes completely closing the channel. In *Dosaiga* the road from *Mongalhar* to Dosaiga was constructed beside

the *khal,* narrowing and obstructing its flow and causing drainage congestion in this area. This year (1992) one such road is being constructed on the South of *Dosiga* in SC-E6 closing a *khal* which drains out water from the *Atia beel.*

Re-excavation of *Deojan khal, Aloa Tarini khal* and *Thanar khal* will solve the drainage congestion problem of this area. A few internal link canals; one in *Burburia*, one in *Gomjani* and one is *Dosaiga* will have to be re-excavated to relieve some low pockets. At the outfall of *Deojan khal,* the *Lohajang* river needs re-excavation.

Deojan khal was excavated once in the 1960's. In 80 local people re-excavated this *khal* again to relieve drainage congestion of the adjoining areas. *Aloa-Tarini khal* was re-excavated in '77 through the FFW programme. The *Lohajang* river was also re-excavated in '78 from *Jugini* up to *Karatia.*

Due to the Southward surface flow, water hyacinth is a problem in the southern parts (*Dosaiga*) and damages the Aman paddy. But in water hyacinth also serves the purposes of sheltering fish, crop manuring and as a fertilizer. Water hyacinth usually stays in *beels* and *pagars* in the dry season and during monsoon multiplies and spreads out.

Plenty of boats of all sizes ply in this area although the monsoon, mostly for freight movements. People are against the idea of constructing any water regulating structure because they want to keep the navigation routes open. They prefer bridges.

Erosion

There is no erosion problem from the *Lohajang* river in the North.

Ground Water

There are plenty of DTWs and STWs in this sub-compartment. Ground water is adequately exploited, although there is scope for limited expansion in some areas such as in *Dosaiga.* Discharge from the tube wells are normal although the season except in drought years, when discharge become less in April.

For drinking purposes HTW's are used, but their numbers are not enough to meet the demand. Open wells are used for washing and cooking. There is no complain of any appreciable discharge problem from HTW's.

Conclusion

This sub-compartment suffers from drainage congestion problem due to silted up *khals.* The long *Atia-Kumaria beel* commands the major surface water flow in the area. Early monsoon flood is mainly due to rainfall which cannot be drained out because of the silted up channels. Late monsoon drainage also suffers due for the same reason. Re-excavation of the *Deojan khal* and *Aloa-Tarini khal* in the North and *Thanar khal* in the South will relieve the drainage congestion of this area.

Ground water resource is adequately exploited, although there is scope for limited expansion in some areas. People are apparently motivated and cooperative for development works in the area.

14.3 AGRICULTURE

The approximate gross area of the SC-14 is 1140 ha out of which the net cultivated area is about 900 ha. The major cropping patterns practised by the farmers of the area are given below. Land mostly is of the F2 and F3 types. About 40% of the total area is F0 and F1 type. Major crops grown in the area are Boro (HYV)/Braus (late Boro). T. Aman is grown on F1 and F0 land. Aus is grown to a limited extent. Among the Rabi crops, wheat and mustard are prominent:

Crop Patterns

Kharif-1	*Kharif*-2	Rabi	Approx. % of cultivated area
F1 B.Aus/Jute	T.Aman (L)	Wheat/Potato	20%
F2 -	Aus+B.Aman (L)	Wheat/Pulse/Mustard	15%
F2 -	TDW/B.Aman	Mustard/Boro(HYV)/Braus (Late Boro)	30%
F3 -	-	Boro (L)	2%
F1 -	T. Aman	Boro(HYV)/Braus	10%
F0+F1 Aus/Jute	-	Wheat/Potato/Pulse	10%
F3 -	-	Boro (HYV)/Braus	10%
F0 -	-	Sugarcane(Intercultured with pulse/veg) (Annual)	3%

Average Crop Yield and Price

The average yield of different crops and their farmgate price in harvesting period are given below cropwise:

Crops	Yield MT/HA	Price/MT
B. Aus	1.90	5360/-
T. Aman (L)	2.60	6030/-
TDW Aman	2.00	6030/-
B. Aman	1.90	6030/-
Boro (HYV)	4.80	6030/-
Braus (late Boro)	4.20	6030/-
Boro (L)	3.25	6030/-
Jute	1.80	4820/-
Wheat	2.00	5360/-
Mustard	1.10	10720/-
Potato	9.80 (local)	3200/-
Pulse	1.00-1.20	13400/-(Lentil) 7238/-(Khesari)

Use of Fertilizers

Farmers reported that they can not use the optimal doses of fertilizers to their crops for the lack of funds and credit facilities. They do not take credit to avoid the complexity and formalities of taking credit. Bank employees demand a high amount to give them loan.

The average use of fertilizers per ha in the area are 70-80 kg of urea, 50-60 kg of TSP and 10-15 kg of MP for Aus and T. Aman. In Boro (HYV) or Braus (late Boro) about 160-170 kg of Urea, 130-150 kg of TSP and 80-90 kg of MP is applied for wheat and mustard. 90-100 kg of Urea and 60-70 kg of TSP is usually used. In other crops fertilizers are used less, but a considerable amount is used in sugarcane.

Irrigated Crops

Almost 50 percent of the area is under irrigated crops. Only the Boro crops, both local HYV, are grown with irrigation. Local varieties of Boro crops are grown in a small area along the side of the ditches and *beels* and on standing water which are irrigated by indigenous methods. Irri Boro or Braus are irrigated by DTWs and STWs installed by groups of farmers (KSS) or rich farmers and the Grameen Bank. Farmers pay 25% of their production as the irrigation cost. Crops other than Boro (HYV) and Braus (Late Boro) are mostly grown under rainfed condition. Rabi crops are grown on the basis of the available moisture.

Mulching is practised to retain moisture by covering the field with water hyacinth in case of growing potato. During the MDSC survey the following DTWs and STWs were found in the surveyed and adjacent villages:

Village	DTWs/STWs (Cusec)	Irrigated Area (ha)
Bandabari	STW 5 Nos. (1/2 cusec)	25 ha.
Bakultala	DTW 3 Nos. (2 cusec)	55 ha.
	STW 5 Nos. (1/2 cusec)	25 ha.
Borotia	DTW 1 No.	20 ha.
	STW 5 Nos.	25 ha.
Chikonkhola	DTW 1 No.	20 ha.
	STW 3 Nos.	15 ha.
Mongolhar	DTW 3 Nos.	60 ha.
	STW 10 Nos.	50 ha.
Dasiaga	DTW 1 No.	20 ha.
	STW 5 Nos.	25 ha.
	42 Total :	340 ha.

Crop Damage

TDW Aman and mixed Aus and Aman are affected by early and late flood. Farmers reported that about 60% of young seedlings deep water Aman affected causing due to rapid rise of water in the month of June. The water congestion also delays the sowing and transplanting if Boro (HYV).

In some area of the village *Dasiaga* farmers (February 1992) are uncertain whether they can transplant Boro (HYV) as the land is still under much water. Early flood water also partially

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affects Aus. It is reported that flood water carries a huge amount of water hyacinth around the villages *Mongolhar* and *Dasiagh* causing damage to Aus and Aman crops.

Livestock

Livestock is mostly of local varieties. A few HYV cattle are available in the area, owned by rich farmers. There is a report of acute scarcity of livestock feed in the months of August - October.

Livestock assistants visit the area occasionally but the Veterinary Surgeon rarely visit the area. Medicare is provide to livestock when farmers attend the *Tangail Veterinary Hospital.* There is a livestock centre in *Deojan* from where artificial insemination is given to cattle. For each artificial insemination Tk.20/- is charged. Farmers complained that some of the inseminations were not effective. Further the maintenance of a HYV calf is rather costly and therefore farmers are less interested in artificial insemination.

Farmers feed their livestock with straw, rice bran, pulse residue, water hyacinth etc. Rinderpest, toe disease and cow pox are the common disease among livestock. Shortage of draft animals is indicated by the use of a few powertillers in the area. Each decimal of land costs Tk.5/- for ploughing each time. Farmers even use milch cows as draft animals to compensate for the shortage of draft animals in the area.

Poultry

Almost all the poultry population belongs to local varieties although a few farm poultry both chickens and ducks are found in the sub-compartment. Ducks are available where there are water bodies. Poultry mostly live on scavenging in and around the households and on fallow land. Some feed like rice, wheat and bran and other food waste are occasionally supplied to them. Ranikhet, fowl pox and tape worm are common disease among the poultry. Injections are given by livestock assistants once or twice a year.

Own Observation

The land in the sub-compartment is mostly of the F0-F1 (20%) type and this is found along the village periphery. This land is suitable for growing Aus, Jute and T. Aman. The F2 type land (about 30%) occur between the village periphery and the basin sites while the F3 and F3+ (approx.50%) occur in the basin sites. On the F2, F3 and F3+ land Boro (HYV) and TDW Aman/B. Aman are grown extensively. From the observation it is estimated that about 50-55% of the area is used for growing Rabi crops. Among the other rabi crops, wheat and mustard are prominent. Sugarcane, intercultured with pulse or other vegetables, are practised in some areas. The soils of the area are mostly SKI to SK with some FSL to SIL in village periphery. A large area is affected by sand deposition in the *Dasiagh* village.

Conclusion

Irri/Boro (HYV) or Braus is the main crop grown in winter Poor drainage of congested water from some low pockets limits farmers to transplant Boro (HYV) in late winter which results

in low yields. Farmer appealed to improve the drainage condition in the area so that they can grow Aus and TDW Aman without any risk of flooding. Further extension of irrigation facility is demanded with less cost of irrigation so that HYV crops can be grown with high yields. Farmers plough their land with milch cows finding as there is a shortage of draft animals. Powertillers are too expensive, even if hired. Farmers prefer traditional cropping patterns because they are afraid of flood hazard in the area.

Proper medicare of both livestock and poultry by livestock department with regular supply of free medicare is a strongly requested by farmers to protect their investments in this area. They expect introduction of cheap HYV poultry.

14.4 FISHERIES

Fisheries Resources

Water Bodies

The water bodies under the SC-14 with their number, type, area and the available fish species, are shown below in the table:

Sl. No.	Water bodies	Number	Area (Acre)	Type	Available fish species	Annual	Ownership	Remarks
1.	Beel: Atia-Kumaria beel	1	125	Perineal	Common varieties of fish like major and minor carps, catfish, snakeheads, spinyeels climbing perches, small shrimps. Shellfishes like fresh water muscles-lamellidiens and snails including pila globosa.	4800 mds approximately	Few portion of the beel is khash & maximum portion is under multi-ownership	The beel is qualitatively most resourceful in the area
	Mangalhar Bara beel	1	6 acre approx	Perineal	Major and minor carps, shol, boal, silver carp, carfu.	250 mds approx.	Wak of property	Resourceful
2.	Pond	10	11 acre approx	a few are cultural & are culturable	Common varieties of carp like Rui, Katla, Mrigle, Sar Puthi, Tilapia, Nilotica, Silver carp and carfu etc.	Poor	Individual	Pondculture is not well developed

Atia-Kumaria Beel

The *Atia-Kumaria beel* passes through the village *Aia, Kumaria, Mangalhar* and *Bandabari*. Out of the approximately 125 acres of land in the *beel*, only a small portion is Government *khash* and the rest is under multi-ownership. Different varieties of fish are available and both the professional and non-professional fishermen go fishing in the *beel* round the year.

The professional fishermen in the area entirely depend on this *beel* fishery for their livelihood. Over and above this, the surrounding villagers catch fish from this *beel* for their own consumption and poor people in the area maintain their family by selling fish. People also uses the water of the *beel* for irrigation purpose during the dry season. During the dry season the *beel* is the only source of water for the whole locality and it is used for various domestic purposes other than drinking. Many *pagars* have been excavated by the people on

the outer edge of the *beel* and these are managed by their respective owner. December to February is the peak fishing period in the *beel*.

Professional Fishermen

About 42 households of professional fishermen live in *Pathrail* village under *Delduar* upazila. The professional fishermen catch fish in the nearby rivers, canals, *beels* and ponds. The socio-economic conditions of the fishermen in the area is not good.

It is reported that some of the household of professional fishermen have taken up part-time weaving. The reason of this is that the existing fishery profession is not as profitable as to before.

Governmental loans for purchasing necessary inputs for fishery are not easily available to the fishermen of the area. The head of the household and male children above 11 years go fishing while the mother and daughters make and repair nets. It is reported that they cannot go to the *Jamuna* and *Dhaleswari* rivers as they cannot afford the necessary fishing inputs. The catch of the fishermen are sold either directly to the local markets and sometimes via middle man. The professional fishermen are low cast Hindus while the most of the middlemen (*Nikari)* are Muslims.

Fishing Periods

Fishing goes on round the year but the months of October - February are the peak period.

Fishing Methods

Various fishing methods are used. The main techniques and gear used by both the professional and subsistence fishermen are as follows:

- Net such as *Berjal, Kharjal, Dharmajal, Jakhijal, Fashal, Maijal* and *Karentjal*.
- Traps such as *Dhair, Darki, Ahuka, Hosa* and *Polo*.
  Harpoons such as *Kouch, Eko, Tenta* and *Aro*.
- Lines such as *Chhip, Chhara*.
- Exclusive fishing of *beels* and ditches in the dry season sometimes using low lift irrigation pumps.
- Hand picking in shallow water in the dry season.

Flood Plain Fishery

Flood plain fishery is well practised in the area as much of the area remains under water for a period of 5 to 6 months. At that time the flood plain is naturally stocked with different kinds of fish. Both the professional and non-professional fishermen catch fish freely from the open water. Many people catch fish and meet their own consumption, as this time most of the villagers do not have any work.

The flood plain area is a good habitat for the brood fish to spawn. The fish from the surrounding river migrate to the flood plain during monsoon and the brood fish spawns in the flood plain in May-June. So the flood plain is the good place for fish multiplication. In the

post-monsoon period i.e. with the receding of flood water in the flood plain, the available fishes migrate to the deep water bodies like perineal *beel, pagars* and homestead ditches.

Institutional Facility

It is reported that no institutional facility is available in the area.

Fish Predation and Fish Diseases

Fish predation is reported. The predators like *Snakes, Aoir, Boal, Shol, Taki, Lozards frogs* etc. take part in predation and thus causing loss to the fish population.

Fish disease is reported to be serious in the area. Almost 80% of different varieties of fish are under attack. Fish like *Taki, Khalisha, Shol, Cat fishes* etc. are reported to be seriously attacked with the disease. The other varieties of fish are also attacked but the intensity is low.

The shrimp population is reported to be free from this attack. People say that over the last few years the fish population has significantly decreased due to the fish disease. This disease is known to the local people as *Khoto Rog* which is scientifically known as *Epizootic Ulcerative Syndrome* disease. As a result of dead fish the water bodies become seriously polluted. Sometimes the villagers cannot use the surface water for domestic uses like washing, and bathing.

Own Observation

Pond fish culture is not well developed in the area. People seem to be ignorant about pond fish culture although resources are there. Only in a limited (about 3/4) number of ponds they have started pond fish culture.

Atia-Kumaria beel is very big and an important water resources. It is a long *beel* which passes through 3/4 villages like *Atia, Kumaria, Mangalhar, Bandabari* etc. Many professional fishermen were found fishing in the *beel* by cast net and *Berjal*. Most of the fishes from their catch were found diseased. People from remote areas were found going to the *beel* for their bath and also for bathing their cattle. People were also found irrigating the outskirt crops. Many birds were found to feed in the *beel* and some aquatic bird (like *Panikauri* and some unknown duck type bird) were also found grazing.

Conclusion

People urged to dig up more ponds, re-excavate existing *pagars*, road side ditches, and perineal *beel* (*Atia-Kumaria beel)*. They asked for help to give the idea of pond fish culture. People in the area are very much concerned about fish diseases and urged to help them to control the fish disease.

14.5 ENVIRONMENT

Significant Natural Vegetation

Homestead forest is well developed in some villages (*Bandabari, Bokultala* and *Mangalhar*) but in the other villages (*Dosaiga, Chinakhola*) it is not well developed. The homestead forests cover an average area of 0.3 acre in each homestead. Homestead forests provide an excellent refuge for wild animals like *Jackle, Mongoose, Guishap (Reptiles); Snakes, Owl, Birds* of different varieties *Jungle cats, Bagdasha* etc.

The varieties of trees found in the homestead forest are Mango, Jack-fruit, Lemon, Hard-fruit trees, Mahogany, Bamboo bush, *Shimool, Segun,* Banana, *Khajur,* Palm, Papya, *Goyeva* etc. A special type herbs locally known as *Thankuni* scientifically known as *Runners* is present along the road side and bushes which is very useful for the people suffering from intestinal disorder like dysentery. Another climbing type of herbs locally known as *Vitachare* is also present which is very useful to cure cut injury. The area does not have any natural forest. Rats are abundant in the area.

Aquatic Vegetation

Water bodies have many aquatic vegetation like *Hydrilla, Water lily, Water hyacinth, Kalmi lata, aquatic grass* and many other unknown aquatic vegetation.

Biological

Arthropods

Many insect are present in the homestead bush. They include mosquito, house-fly, grasshopper, butterfly, honey-bee, cockroach etc.

Mollusca

Unio and *pila* are also present in the water bodies. *Pila* is a good source of duck food. Many birds visits the shallow water where they find small *pila*.

Annelids

It includes earthworm, leech etc. and these are reported to be present in the area. Earthworm is also called the natural tiller of land and it also increase the fertility of agricultural land.

Fish

Different kinds of fish are reported to present in the water bodies of the area.

Amphibian

Toads, Frogs, *Hyla* etc. are present both in water bodies and homestead forest, but their population has considerably decreased. There is a report that 1 or 2 years ago some people

used to catch frogs and toads from the nearby water bodies on a commercial scale and sold it to the traders. Since then their population has decreased significantly. But this toad catching practice is now no more found in the area.

Reptiles

Snakes, both poisonous and non-poisonous, Lizard, *Varanus* (Guishap), Tortoise though less in number are reported in the area. Since *Guishap's* skin has much market value - a group of people kill and sell them.

Birds

People say that the bird population in the area has significantly decreased, due to hunting (by gun). During winter the guest bird like *Behe duck, Kal-dighiri* etc. visit the area. Crows are reported to be very rare in the area, but *Shalik* are present in the nearby bushes. Cuckoo and Owl is also found. The herons are reported to prey in the shallow water during day time.

Mammals

Terrestrial Wild Animals

Wild animals including Jungle cats, rats, jackle, mongoose, bagdasha etc. are reported. There is also a report of two peculiar type of animals locally known as *Nangar*, a big, size cat like animal with a fruit eating behaviour and *Kalkot*, a dog like animal.

The rat problem is serious and causes a lot of damage to food stuff and to public property. During paddy harvesting the rat problem become severe.

Domestic Land Animal

Domestic land animals like cows, cats, bulls, goats, sheep etc. are reported though in reduced number. Cattle disease is found in the area. About 30-35 cows died 2/3 months before due to the disease.

Others

Afforestation

There is a report of a road side afforestation initiated by the forestry department in the village *Desaiga*. This programme has been done with the collaboration of the local people and they are entitled to enjoy the fruits of the trees. In other areas there is no such report but people at their own initiation plant trees in their own homestead during the rainy season.

Deforestation

Deforestation, though practised in the area, is of a minimum scale. People at their time of need sell out the timber yielding trees to the *Pharia* (the middle man) on a considerable price. The timber of this trees is used mainly in furniture mailing.

Others

Human Habitation

There is a report of new human habitation in the area. About 3/4 new houses have been build in the village *Mangalhar* last year, covering an average area of about 30 decimal per house.

Pollution

People throw their household garbage in the homestead ditches which rot in the water and makes the water polluted. Stagnant and polluted water enables mosquito growth. There is no assigned place for dumping garbage, dead animal bodies etc. Besides this brick-field discharge and open sanitation is also a source of pollution. People reported that due to the brick-field, crops nearby are damaged.

Own Observation

Many road side ditches, and *pagars* with shallow water were noticed and the same was seen being used for many household consumption other than drinking. With the exception of few cases kitchen gardening is not practised. Bamboo bushes are well developed in the area. fauna) were also found. The skeletons of many dead animals (cows, goats etc.) were found here and there.

Conclusion

There is a great demand to increase water reservoir near the homestead so as to facilitate domestic use other than drinking. They told that homestead water reservoirs will be very much useful for duck cultivation in addition to their household use. They urged to supply them quality seeds to boost up kitchen gardening. There is also public demand of saplings of Mahogany and Segun tree in the area which they told to be more useful for development of homestead garden. They urged to provide them cattle medicare as cattle disease is a serious concern in the area.

14.6 SOCIO-ECONOMIC SITUATION, MALE

Major Non-Farm Activities

The households of the surveyed area (*Bandabari, Bakultala, Aloa Tarini, Baratia, Mongalhar* and *Dasaiga* village) are mainly engaged in the weaving industry (except those of *Bandabari* village). Weaving covers about two third of the non-farm activities in the area. From the rest one third, daily labourers (both agricultural and non-agricultural) transport workers (Rickshaw and Van), Petty and small businessman cover 80%, while others are mainly service holders including some traditional professionals like carpenters fishermen and barbars.

The households of *Bandabari* village engaged in non-farm activities are mainly agricultural labourers (60-65%), service holders (15-20%), Rickshaw pullers (10-15%), weavers (10%) and others.

Social and Institutional Aspects

Employment Patterns

In the farm households mainly family labour is used except in a few households in *Bandabari* and *Mangalhar* (western part) villages. These households are mainly rich farmers and/or service holders. Use of hired labour is common during peak season of agriculture, particularly during sowing and harvesting of HYV Boro paddy. During the lean season of agriculture the day labourers migrate to other areas to find work, both in agricultural and non-agricultural field (mostly in the non-agricultural field). The young people (15-40 years range) are mainly engaged in weaving and other non-agricultural works like construction works, transportation etc. while older people find their work primarily in agricultural. Some engage themselves in seasonal businesses and other petty businesses.

During the lean season of weaving the workers in the industry find work in agriculture but within the locality. Out-migration of labourers occurs particularly from *Baratia, Bakultala, Aloa Tarini* and *Mangalhar* villages, while (during peak season for agriculture) in-migration of labourers in the whole area is now a regular phenomena.

Wage Rates

Wage rates of daily labourers in the surveyed villages differs from one village to another and also varies during lean and peak seasons. The following table shows wage rates of daily labourers at different times in the area:

Sl. No.	Village	Wage rate of Daily Labourer							
		Lean Season				Peak Season			
		Wage with Meal		Wage without Meal		Wage with Meal		Wage without Meal	
		Tk.	Meal (time)	Tk.	Meal	Tk.	Meal	Tk.	Meal
1.	*Bandabari*	15-20	02	-	-	25-30	02	-	-
2.	*Bakultala*	25	01	-	-	30-35	02	-	-
3.	*Aloa Tarini*	20-25	01	-	-	30-35	02	-	-
4.	*Baratia*	20	-	-	-	25-30	01	-	-
5.	*Mangalhar*	-	-	20-25	-	30-35	01	-	-
6.	*Dasagia*	12-15	02	-	-	20-25	02	-	-

Wage rate for weaving industry worker however, do not differ much but varies slightly during its peak season (mainly one of two months before Eid-ul-Fitre) when they get Tk.10-15 more for per sari produced. This increases their daily incomes from Tk.35-40 (without meal) to 40-45. This is the rate of a common sari producer.

Education and Literacy

The literacy rate also varies from one village to another. The village wise literacy rate is shown in the following table:

Sl. No.	Village	Literacy rate
1.	*Bandabari*	25-30%
2.	*Bakultala*	15-18%
3.	*Aloa Tarini*	18-20%
4.	*Baratia*	30-40%
5.	*Mangalhar*	35-40%
6.	*Dasaiga*	20-25%

At present, the area seems to have sufficient educational institutions and for the young children they are approachable throughout the year except in one or two cases. The educational institutions or facilities were inadequate even 2/3 years back in *Bakultala* and *Aloa Tarini* villages, therefore, the literacy rate is lower there. But now in all the villages the enrolment of students in schools is high.

Organized Groups

The area has a quite a few organized groups of different NGO's and BRDB. Village wise information about organizations and groups are shown in the following table:

Village	Organization and Groups/Samity	No. of Groups						Remarks
		Male		Female		Mixed		
		No.	Member	No.	Member	No.	Member	
Bandabari	1. Grameen Bank(Mahila Samity)			01	30			
	2. BURU			01	?			
	3. BRDB:							
	a) KSS	01	22					
	b) BSS	01	20					
	c) MBSS			02	26 + 17/18			
Bakultala	1. Grameen Bank	01	25					
	2. BURO	-	-	-	-	01	25-30	
Aloa Tarini	1. Grameen Bank	02	25+30					
	2. BURO			01	40			
	3. SDS (for Children)					01	50	
Baratia	1. Grameen Bank	01	25	01	25-30			
	2. SDS					01	40-45	
	3. BURO*			03	60-80			Just started functioning.
	4. BRDB (MBSS)			01	10-12			
Mangalbar	1. BURO			01	60-65			
	2. Grameen Bank	01	25-30					
	3. BRDB (KSS)	01	20-22					
	4. VDP/ANSAR					01	100-125	
Dasaiga	1. BRDB (KSS)	01	45					
	2. CARE(Mahila Samity)			01	30			
	3. BURO					01	45	

Public Facilities

Public facilities like Post Office, Union Office, Health and Family Planning Centres/Clinics are all available within maximum 2 kilometres from the villages in the surveyed area.

Transport and Communication

Except *Bandabari* and *Dasaiga* all other villages in the surveyed area are connected with *Delduar-Tangail* and *Silimpur/Elasin-Tangail Pucca* road. But the roads within villages and in some places between villages have some breaches which causes problems to the people particularly during the rainy season. Rickshaw and vans can use the roads through the dry season.

Markets

The area has sufficient markets. The markets/bazaars of the area with hat day and attendance are as follows:

Sl No	Market/ Bazaar	Hat day	Bazaar day	Attendance	
				Hat day	Bazaar day
1.	*Baratia*	Thursday	Everyday	20/25000	5/7000
2.	*Bhurbhuria*	Sunday	-	800-1000	-
3.	*Silimpur*	Friday	Everyday	8/10000	1200-1800
4.	*Baruha*	Tuesday	Everyday	5/7000	1000-1500
5.	*Bajitpur*	Thursday	-	4/5000	-
		Friday	-	1500-2000	-
		Monday	-	2/3000	-
6.	*Pathrail*	-	Everyday	-	2500-3000

General Needs

In respect of education, health, communication and marketing the people of the area do not suffer much. Those who want to use roads during rainy season face problems with the break in transportation, particularly the people of *Bandabari, Dasaiga* and *Mangalhar*. The roads in thir areas have some breaches, some washed away parts, and also some low sections. Putting some culverts in the roads and re-sectioning and repairing of these roads is very much needed for the year round easy movement of the people.

Construction of a bridge on *Bandabari-Baratia* road is also very much needed for the people of *Banabari* as well as *Baratia*, to allow them to go to *Tangail* or *Delduar*. Presently the people of *Bandabari* go to their district and upazila head quarters *Tangail* and *Delduar* (for different purposes) via *Elasin* (through a long way). *Baratia* people will also be benefited from this bridge going to *Silimpur, Elasin* and *Nagarpur*.

Extension service for poultry, livestock, agriculture and fishery is quite inadequate and in some places un-available. People of these area expressed their need to have such extension services.

Own Observation

Existing Water Related Situation

Almost the two thirds area the sub-compartment suffers drainage congestion problems by early monsoon and flooding from the *Lohajang*. The central part and the southern part of the compartment is low-lying and has a perennial water body (part of a dead river) in the middle. The water congestion is acute there. This problem is caused to the siltation of the *Deojan khal* that connects the dead river with the *Lohajang*. This used to be the main drainage channel of the area. This drainage congestion problem causes damage to HYV Boro production, hampers Aman cultivation and leaves no opportunity for Rabi crops in a vast area.

Socio-Economic Situation

Among the surveyed villages in the sub-compartment the people of *Bandabari, Mangalhar* and *Dasaiga* have better economic condition then the other three villages viz. *Aloa Tarini,*

Bakultala and *Baratia*. But culturally and socially *Mangalhar* and *Baratia* village people are more advanced than others.

Peoples Opinion (about solving water related problems)

The majority of the people in the area expressed their view that re-excavation of *Deojan khal* and other *khals* connected with it will help remove their drainage congestion problem and thereby boost up agricultural production in the area. The navigation, has been threatened due to the siltation of the *Deojan khal*, will also be facilitated if the *khal* is re-excavated.

Although the danger of re-excavation the *khal* is sand intake from the *Lohajang* into the *chaks*, about which the people are aware, even then they favour the *khal's* re-excavation for the greater interest of the people of the whole area. The idea of constructing a sluice gate at the *khal* mouth to reduce sand intake from the *Lohajang* has been rejected by the people. The reason is they think a sluice gate there will firstly, stop navigation, secondly, will decrease fish population inside the area and thirdly, the area may suffer from shortage of water for agriculture. So they only requested the *khals* re-excavation, knowing very well about its implications.

Conclusion

The main problem of the area is water logging and drainage congestion due to the siltation of the *Deojan khal*. The socio-economic development of the area greatly depends on the solution of this problem. The re-excavation of the dried part of the *Kumaria-Atia beel* (the dead river) and its deepening in some places is also a much expressed need as it would remove the drainage congestion problem chaks beside the beel and increase the fish population. This will also facilitate irrigation in the surrounding *chaks* and thereby more agricultural production will be ensured.

The other important development need of the area is a bridge on *Bandabari-Baratia* road which is also an important factor for the socio-economic development of the area, particularly for the people of *Bandabari, Aloa Tarini, Kumaria* and *Baratia* village.

14.7 SOCIO-ECONOMIC SITUATION - WOMEN

Employment Patterns and Activities of Women

Women of sub-compartment 14 are mainly involved in household work. There are many women of *Bakultala* village who are engaged in weaving. A few women in the visited area are involved in weaving work professionally and some are engaged in service like family planning volunteers, nurse, teacher, BURO worker.

Some women in every village are sewing cotton wrappers (*Khatha)*. Before and during early winter there are mainly busy with this business. Women (15-20) from the landless families of the area find their earnings through work in houses of rich people during and after the harvesting of paddy. Some women from Hindu families in *Bandabari* village make fine mats.

In every village, there are some *Dais*, who got training through CARE, FPAB. A few women in *Baratia* village are engaged in earth cutting to raise the floor of houses and doing so they earn cash. In this village, there are some girls (aged 9-14) who are cutting grass for livestock and they also earn cash.

Wage Rates

Women weaving workers in the visited area earn Tk.10-15 per day. Women, who work during and after the harvesting of paddy and other crops, earn not in cash but in kind. If they work one or more months they receive 1-2 mound of paddy, one *Saree* and a meal three times a day. Women who are sewing *Katha* earn Tk.30-35 from a big size and Tk.15-20 from a small size *katha*. Women maning fine mats earn Tk.30-40 or a big size and Tk.15-25 or a small size fine mat. Family planning volunteers of FPAB earn Tk.550, per month. Women who cut earth earn Tk.20-25 and they work from early morning to noon. Girls who cut grass for livestock, earn Tk.5 for each basket grass.

Education and Literacy

The literacy rate in *Bandabari* village is about 20-25%. The ratio of students is 60% boys and 40% girls. The literacy rate in *Bakultala* village is about 8-10%. The ratio of students is 75% boys and 25% girls. The literacy rate in *Baratia* is 15-20%, while in *Mongalhar* the rate is 15-18% and in *Dasaiga* the rate is 12-15%. The ratio of school going children in these villages are 60% boys and 40% girls in *Baratia*, 65% boys and 35% girls in *Mongalhar*, 70% boys and 30% girls in *Dasaiga*. The educational institutions and facilities are available around the village.

Although in every village, the educational institution are encouraging the enrolment of children, yet there are maximum drop out especially for girls. Parents of girls think that if they give higher education to their girls, the amount of dowry will be higher in case of educated male bride. Religious barriers, superstition, poverty are other factors which result in the low enrolment of girls.

Public Facilities

Public facilities like Union Council office, Post office, F.P. Clinic, Health Clinic etc. are available around the area within one and three mile distance from the villages. Women of these villages think it is very hard to walk a long distance, especially in the rainy season, for receiving the service of family planning and EPI program.

Organized Groups

More or less in all visited villages organized groups such as local NGO, BRDB, BURO, CARE, Krishi Bank are present. The list of the organized groups with their activities are given below:

Bandabari

- BURO - *Bandabari Mohila Kendra* (Member, Female = 20)

Activities - Savings habits creation/literacy program.

- *Banalata Bhumihin Mohila Samity* - directed by Grameen Bank (Member, Female = 30)

Activities
- Savings habits creation.
- Disbursement of loan.
- Literacy program.
- Enjoy sports once a year (only members children).

- BRDB has 4 Samities in *Bandabari*.

- *Bandabari Uttarpara Mohila Samity* (Mmeber, Female = 30)
- *Bandabari Dakhinpara Mohila Samity* (Member, Female = 25)

Activities
- Savings habits creation
- Literacy program
- Giving training on family planning, primary health care for children/nursing and pregnant mother.

- *Bandabari Bittahin Purush Samity* (Member, Male = 35)

Activities
- Savings habits creation
- Literacy program

- *Bandabari Krishi Samabaya Samity* (Member, Male = 60)

Activities - Giving training on the improved agricultural methods.

There are two samity in this village formed by young males such as:

- *Bandabari Tarun Samity* (Member 40)

Activities - Savings habits creation, buying parda, utencils for social ceremony.

- *Bandabari Shabuz Zuba Shangha* (Member - 34)

Activities
- Savings habits creation
- Disbursement of loan
- Sports (within/outside village).

Bakultala

- BURO (Member, Female = 25)

Activities - Savings habits creation

- SDS (Member, Children - not knwon)

Activities
- Savings habits creation
- Supply medicines for children
- Supply books for children from class six to SSC level (only for members).

- *Bhumihin Mohila Samity* (Female, Member = 25)

Activities - Savings habits creation

Baratia

- *Bhumihin Mohila Samity* - directed by Grameen Bank (Female, Member=30)

Activities
- Savings habits creation
- Literacy program

- BURO (Member - not known)

Activities - Savings habits creation

- SDS (Member = 25)

Activities
- Savings habits creation
- Giving medicines among the members.

Mongalhar

- BURO (Members = 45 Female)

Activities
- Savings habits creation
- Literacy program

- SDS (Member - not known)

Activities
- Savings habits creation
- Giving medicines among the members.

- *Bhumihin Mohila Samity* - directed by Grameen Bank (Member 40 Female)

Activities - Savings habits creation

- *Ansar VDP Unnayan Gram* (Members 60-61 Female)

Activities - They have a plan to give training on sewing but yet not started.

Dasaiga

- BURO (Member 30 Female)

Activities - Savings habits creation

- *SLA Samity directed by CARE* (No. of Female Members 30)

Activities - Savings habits creation
- Literacy program.

General Needs

The main need of the women of the visited area is more tubewells. There is also a scarcity of permanent water body such as ponds. A health centre/clinic is also needed in this area to provide health care service. In respect of education, girls need a girls high school in their own village. The girls parents think it is much safer to go to a school close by.

Existing Water Related Situation

In *Mongalhar*, serious skin diseases have seen among the women and children. Stagnant is found in this area and many women have to use this dirty water.

SUB-COMPARTMENT 15

15.1 INTRODUCTION

Sub-compartment 15 is a part of the main compartment of the *CPP-Tangail* and covers a triangular area on the southern boundary. This area is bounded by *Koijuri-Khagjana* earthen road on the North and East, *Silimpur-Karatia* earthen road on the South and *Tangail-Delduar* paved road on the West. The *Koijuri-Khagjana* road also serves as an embankment beside the *Lohajang* river. The area covered by this sub-compartment is about 690 ha. The western part is mostly medium high land and the eastern part consists of mostly low lying land. About 50% of the farm land is low lying, affected by drainage congestion.

15.2 HYDROLOGICAL SITUATION

River Flow: Flooding and Drainage

The surface flood flow enters this sub-compartment from the *Lohajang* river through the *Pathrail khal* on the West, *Kumulli khal* on the North and *Birkushia khal* on the East. During high river stages, a number of breaches on the *Koijuri-Khagjana* road also allow flood entry into this area. The lowest farm lands *(chaks)* in *Tetulia, Akenderpara, Gopalpur* and *Birkushia* are filled up and the water then spreads to the higher land.

In early June flood water enters through the *Birkushia khal,* located at the lowest part of the area, flowing to the low farm land of *Birkushia, Tetulia* and *Akenderpara.* Due to higher elevation of the intake of *Kumulli khal,* flood entry through this *khal* starts in late June. The *Pathrail khal* is still higher and flood entry through this channel starts in mid-July. A major part of this intake flows east to *Nalsunda* and *Birkushia*, part flows south to *Pathrail* and *Dhulutia* and another part flows north to *Chandigram, Bishnupur* and *Akenderpara.* About 70% of the farm land of *Akenderpara* is low, reported to be lowest in the area and flood entry from all directions.

Flood entry continues through August and early September. Usually drainage starts in late September. There is hardly any drainage through the *Pathrail khal* due to its higher location. Some drainage takes place through *Kumulli khal.* This *khal* is deep in the middle, but relatively high at both ends. As such drainage through this *khal* stops early, leaving most of the adjoining areas congested.

In the South drainage takes place through a number of breaches on the *Karatia-Silimpur* road following to *Lohajang* through SC-E7. Over two of these breaches, culverts are being constructed under U.S. Aid Programme through LGEB. In the South-West corner two box culverts on the *Pathrail-Delduar* paved road, drain out to SC-14.

Major drainage of this sub-compartment takes place through the *Birkushia khal* on the East. General land slope is eastward causing most of the farm land to drain to this *khal.* The *khal* section is not adequate to ensure proper drainage of this big area. As such quite severe drainage congestion is experienced in the low farm land of *Birkushia, Khagjana, Akenderpara, Paikpara, Bishnupur, Gopalpur* and *Nalsunda.* There is strong demand from

people of this area for re-excavation of this *khal* up to its outfall at the *Lohajang* river. People of *Birkushia* want a straight connection of the *khal* to *Lohajang* river by excavating about 500m. of new channel, instead of about 1km. of original meandering *khal* passing through a perennial *beel* in E7 (South *Birkushia*).

To the North, there is demand for re-excavation of *Kumulli khal* to ensure drainage of the low areas of *Fusukia, Kumulli, Tetulia* and *Narunda*. A few internal link canals are to be re-excavated to interconnect the low pockets enabling free flow of water for proper drainage. The *khal* from *Akenderpara* to *Birkushia* through *Gopalpur* (about 600m. length), and the *khal* from *Kumulli* to *Birkushia* through *Khagjana* (about 1km) are prominent link canals. They existed 10-15 years ago but now silted up in some locations and converted into farm land. There is demand from the local people for re-excavation of the *Lohajang* river to improve its drainage capacity.

Road construction through FFW programme has closed a number of *khals*, aggravating the congestion problems. During the monsoon people cut open the roads at many such locations to allow proper flow and to ease drainage congestion. Flood flow through the *Pathrail khal* during the early monsoon flood of 1991 almost inundated the homesteads of *Nalsunda* village. Then the affected people cut open the *Nalsunda-Gopalpur* road to let the water flow East to *Birkushia*. It is necessary to construct about 7 culverts at such locations.

About 30 years lack there was a sluice gate at *Fuankia* on the river bank road to regulate flow on to the farm land of *Fusukia* and *Khagjana*. Due to lack of maintenance this structure collapsed. A breach exists in this location now. There is local demand for re-excavation of this *khal*, with a culvert at the breach to the water management in the farm land of *Fusukia* and *Khagjana*.

About 1km. length of *Pathrail khal* was re-excavated in 1979 from the river up to the culvert in the market, through FFW under the Union Parishad. *Birkushia khal* was re-excavated in 1982 through FFW. Local people voluntarily re-excavated this *khal* in 1988 near the outfall to the river *Lohajang*. The river *Lohajang* itself was re-excavated in 1979 (about 5-6 km.).

Water hyacinth multiplies during the monsoon. Sometimes this creates problems in croped areas. After the monsoon extra cost is involved for clearing of the land, where the water hyacinth accumulated. The water hyacinth is used as a fodder, for covering potato plants for mulching and as a fertilizer by burning and rotting.

Country boats, small and medium are widely used in the northern part of the sub-compartment. From June to September boats are used for transporting people and freight. Weekly village markets command the major boat routes.

Erosion

During the high flood of 1988, there was erosion of the river bank at *Fusukia*. But since then no new erosion has taken place in this area.

Ground Water

There are enough DTW's and STW's operating in this sub-compartment leaving very little scope for any further expansion. People generally drink HTW water, but there is scope and demand for installing more HTW's. Specially in the *Birkushia* area many people drink open-well water due to scarcity of HTW's. The quality of ground water is good and iron does not seem to pose any problem for drinking and irrigation. In drought years there is a report of less discharge from tube wells in April - May.

Conclusion

The main problem of this sub-compartment is drainage congestion in the early monsoon and late monsoon period. Surface flood water enters from the *Lohajang* river through three *khals; Birkushia khal* in the East, *Kumulli khal* in the North and *Pathrail khal* in the West. Drainage is effected mainly through the *Birkushia khal* and partly through *Kumulli khal*. But these *khals* are silted up and clearly incapable to properly drain out their respective catchment areas, resulting in drainage congestion in about 50% of the farm land of this sub-compartment. Re-excavation of these *khals* and a few internal link canals will solve the drainage congestion problem. There is demand for re-excavation of the *Lohajang* river to increase its discharge capacity. There are many breaches in the roads to allow proper flow of water, where culverts are required. Ground water quality and quantity are satisfactory and adequately exploited.

15.3 AGRICULTURE

Cropping Pattern

The SC-15 occupies a gross are of approximately 690 ha. The approximate net cultivated area is 500 ha. The survey was carried out in the villages *Nolsandha, Akenderpara, Koijuri, Kumulli* and *Birkushia*. The area is gently slopy to nearly level and there is some depressed land in the basin. The major crops grown in the area are Aus, Jute, T. Aman on high to medium high land and Boro (HYV)/Braus (late Boro) are grown mainly on medium to medium low land in the area. Among the Rabi crops, wheat, mustard and lentils are extensively grown. The present cropping pattern are as follows:

Crop Patterns

Kharif-1	*Kharif*-2	Rabi	Approx. % of cultivated area
F0-F1 Aus/Jute	T.Aman	Mustard/Wheat/Lentil	20%
F0-F1 Aus/Jute	-	Wheat/Potato/Veg	10%
F2 Aus+B.Aman	-	Mustard/Potato/Wheat/Boro(HYV)	20%
F2-F3 TDW Aman	-	Mustard/Wheat/Pulse/Boro(HYV) Boro (HYV)	15%
F2-F3 TDW Aman	-	Pulse/Mustard/Potato	15%
F1 -	T. Aman	Boro (HYV)/Braus	20%

Average Yield and Price

The average yield of different major crops and some cash crops are as follows:

Crops	Av.yield MT/HA	Price/MT
B. Aus	1.45	6030/-
T. Aman	2.60	6030/-
Aus+Aman/TDW Aman	1.90	6030/-
Boro (HYV)	5.00	6030/-
Braus (late Boro)	5.20	6030/-
Wheat	1.95	5360/-
Mustard	0.83	10720/-
Potato	9.70	2680/-
Millet	0.70	4020/-
Pulse	1.0	13400/-
Jute	1.80	

Use of Fertilizers

Farmers usually use fertilizers in different crops in the following doses:

Crops	Urea(kg/ha)	TSP(kg/ha)	MP(kg/ha)
Aus	110-120	90-100	20-25
T. Aman	140-150	110-120	35-45
Aus+Aman	90-100	70-80	-
TDW Aman	100-120	70-80	-
Boro (HYV)/Braus	160-180	90-100	40-50
Wheat	120-130	90-100	30-40
Mustard	100-120	70- 80	-
Potato	110-130	90-100	30-40

Lack of fund or credit is the reason of application of such low doses of fertilizers. Apart from the crops mentioned above the fertilizers application is very little or nil in other crops. Agricultural extension worker rarely advise the farmers on how to cultivate their land in an improved and scientific method. Farmers mostly cultivate their land in traditional ways.

Irrigated Crops

The only irrigated crop in the area is Boro (HYV)/Braus (late Boro). Crops other than Boro (HYV)/Braus are grown under rainfed condition. Vegetables are grown to some extent giving irrigation by indigenous methods. In the Rabi season farmers irrigate their Boro lands by DTWs and STWs. Most of the tube wells are privately owned by rich farmers or a group of farmers. No KSS is available in the area.

There is a DTW installed by GTZ in the village *Chandigram* providing buried pipe irrigation system to about 25 ha of lands in the villages *Chandigram* and *Bisnapur*. Ten DTWs and 27 STWs were available in the surveyed and adjacent villages, details of which are given below:

Village	DTW/STW (Cusec)	Irrigated Area (ha)
Nalsandha	STW 2 Nos. (1/2 cusec)	10 ha.
Dhunatia	DTW 2 Nos. (2 cusec)	45 ha.
	STW 4 " (1/2 cusec)	20 ha.
Akenderpara	DTW 1 No. (2 cusec)	22 ha.
	STW 3 Nos. (1/2 cusec)	15 ha.
Paikpara	STW 2 Nos. (1/2 cusec)	10 ha.
Koijuri	STW 3 Nos. (1/2 cusec)	15 ha.
Fusikia	DTW 1 No. (2 cusec)	20 ha.
Tetulia	DTW 1 No. (2 cusec)	20 ha.
Kumullia	STW 3 Nos. (1/2 cusec)	15 ha.
Goshaibari	DTW 1 No. (2 cusec)	20 ha.
Chandigram	DTW 1 No. (2 cusec) (sub-soil irrigation)	25 ha.
Birkushia	DTW 3 Nos.	60 ha.
	STW 10 Nos.	50 ha.
	Total :	347 ha.

In all the villages (except *Chandigram*) the DTWs and STWs are privately owned. The DTW installed in the village *Chandigram* for buried pipe irrigation installed is under the management of the Grameen Bank. Farmers pay 1/4 of their crops to the owner of tube wells and the Grameen Bank as the cost of irrigation.

Crop Damage

Farmers in the village *Nalsandha* reported damage of TDW Aman seedlings during the early flood and T. Aman due to late monsoon flooding. The damage occur mostly in the years of high rainfall. Poor drainage of the medium low to low land limits the growing of Rabi crops and delays transplantation of Boro (HYV). About 50% of the land is affected by drainage congestion and deep water Aman are affected due to early flooding. T. Aman is affected if their is high rainfall. Early flood also partially damages Boro (HYV).

Farmers in this area requested a canal from *Gopalpur* to *Birkushia*. The major part of the land in the village *Kumullia* is medium high to high and less affected by flood. About 40% of the land in this village is affected by flood, damaging TDW and Aus and T. Aman. In the village *Birkushia*, where about 60% of the area is medium low to low land, flooding affects the deep water Aman causing considerable damage in the monsoon while some HYV Boro in the mature stage are affected by early flooding. The overall drainage situation in the surveyed area is poor and about half the farmers requested to remove drainage congestion to save their deep water Aman and expedite the timely sowing of Boro (HYV) crop.

Livestock

There is a shortage of draft animals. Recently power-tillers have started to be used by medium and big farmers to compensate for the shortage in draft animals in the area. About 10-15% of the land is ploughed by power-tillers which costs Tk.300/- for ploughing one bigha of land three times. Cattle in the area suffer from food shortage. Farmers feed them straw, grass, rice bran etc. No grazing facilities are available in the area except fallow or harvested land.

Free medicare for livestock is rarely available. Farmers have to give incentives to the Veterinary Surgeons for the treatment of their cattle otherwise they refuse to provide treatment on the ground of non-availability of medicine. Rinderpest, cow pox, toe disease etc. are the common diseases of livestock. About 50-60 cattle have died recently due to an unknown disease (might be food poisoning) in the villages of *Kumulli* and *Tetulia*. The affected cattle could not be cured even with treatment.

Poultry

Poultry in the live on scavenging around the households and in harvested fields. About 5% of the total poultry population in area are HYV chickens. Few ducks are available in the area due to lack of water sources. Fowl pox, ranikhet and tape worm are diseases affecting the poultry population. Once or twice yearly mass injection is given to poultry by the livestock assistants.

Own Observation

About 50% of the area is F0 and F1 land. F0 land is mostly situated along the village periphery and on levees. It occupies about 20% of the total area. F1 land (30%) mostly occurs at the basin edge. The rest of the area belongs to F2/(30%) and F3/(20%) where Boro (HYV), Braus and TDW Aman are grown. Out of the total area almost 50% of the land is used for growing Rabi crops 9apart from Boro). Among the Rabi crops, wheat and mustard are prominent. The relief is nearly level, very gently undulating to gently slopy towards the eastern side of the sub-compartment. Soils are mostly medium to fine textured SKI to SK in the basin and basin edge. Soils on levee and along village periphery are FSL to SIL. Buried pipe irrigation system in the village *Chandigram*, provided by GTZ, is a good indication of providing irrigation to dry land crops with less loss of water by seepage.

Conclusion

The drainage congestion is improved farmers will be able to grow Rabi crops on a larger area and plant Boro on time. The late planting of HYV Boro gives poor yields. If the damage of DTW Aman could be prevented, would benefit farmers of the sub-compartment. Disease is epidemic and needs to be controled to save the livestock population. Draft animal shortage is compelling farmers to incur high cost for ploughing their land.

15.4 FISHERIES

Fisheries Resources

Water Bodies

The water bodies under the said sub-compartment with their number, type, area, available fish species and catch are shown below in the table:

Sl. No.	Water bodies	Number	Area (Acre)	Type	Available fish species	Annual	Ownership	Remarks
1. —	Beel	-	-	-	-	-	-	There is no perineal beel in the sub-compartment but flood plain fishery is there.
2.	Ponds	20	25	cultural and	In cultural pond about 10, fish like major carps and minor carps (Rui, Katla, Mrigle, Tilapia etc.) And in culturable ponds fish like Punti, Tilapia, Koi, Shingh, Magur, Taki, Shole etc. were naturally stocked.	Poor	Individual	Pond fish culture is poor.

Professional Fishermen

There are no professional fishermen living in the sub-compartment. The professional fishermen from neighbouring areas go fishing in the *Lohajang* river and some *pagars* and ponds under the compartment on a hire basis.

Fisheries Practices

Both capture and culture fishery are reported to be in practice in the area. Culture fishery, i.e. in closed water like ponds and ditches, are done by pond owners.

Fishing Periods

In the *pagars* fishing is done in the dry season (January/February). Fishing in the flood plain goes on for a period of 3 months (July, August and September). Fishing in cultured pond and river goes on round the year.

Fishing Methods

The main technique and gear used for fishing in the area. They are:

- Nets such as *Berijal, Kharjal, Dharmazal, Jhakijal, Fashal, Maijal* and *Karentjal.*
- Traps such as *Dhair, Darki, Ahuka, Hosa* and *Polo.*
- Harpoons such as *Konch, Eko, Tenta* and *Aro.*
- Exclusive fishing of ditches and *pagars* in the dry season sometimes using low list irrigation pumps (LLP).
- Manpower and wind operated soil boats are reported to be used for fishing in the river.

Flood Plain Fishery

The duration of flooding of the flood plain is very short and reported to be two months only. During the monsoon the area is inundated and is naturally stocked with different kinds of fish which migrated from the river *Lohajang* and existing *pagars.* At that time people catches fish

from the flood plain for their own consumption. With the receding of flood plain water the available fish go back to river and some also are stocked in the pagars.

Institutional Facilities

No institutional facilities like advice is reported to be available in the area.

Fish Predation and Diseases

Fish predation is reported in the water bodies of the sub-compartment. The predators are frogs, turtles, lizard, snakes, kingfishers, herons, eagles and others.

Fish disease is reported to be severe in the area. Almost all fish are said to be attacked with Epizootic ulcerative syndrome disease which has caused a loss of production. The occurrence of the disease is reported to be increasing gradually and the people in the area are seriously concerned.

Other Problems

The other problems in the area is the scarcity of brood fishes due to exclusive fishing in the dry season. It is also reported that due to water pollution, caused by the use of insecticide, the fish find it difficult to survive.

Fish Migration

It is reported that during monsoon the fish from the *Lohajang* river migrate to the flood plain via canals. Most of the fish spawn in the flood plain.

Source of Fish Fry

For pond culture, pond owners manage to get the fish fry (carp) supply from the following sources:

- From nearby fish hatchery (*Elasin, Delduar*).
- From fish seed production farm (*Ashekpur, Tangail, Karatia* road, *Tangail*).
- From *Bhuapur ghat.*
- Surrounding flood plain water by fishing.

Own Observation

Pond culture fishery is not much in practice. In the whole sub-compartment the number of ponds is about 15-20. Villagers were found to use the homestead pond water for various domestic uses like washing, bathing etc. (other than drinking). The ponds are their only source for water use during the dry season. Many ducks were found to graze in the homestead ponds.

The *Lohajang* river passes along the sub-compartment and some ponds were found dry. The canals connecting the flood plain with the river were also found completely dry and silted up.

Fishermen were found fishing in the limited number of *pagars* of the flood plain and the fish catch quantity wise was not satisfactory. About 70% of the fishes were found diseased and fish disease was found severe in case of *Taki, Punti, and Khalisha.*

Perineal water bodies like *beels* are not found, only a limited number of *pagars* in the middle of the flood plain.

Conclusion

Ponds and *pagars* are the main perineal potential water bodies under the sub-compartment through few in number. Since the area is high to medium high and medium low. There is a demand from the public to re-excavate the *pagars* in order to increase the fish habitat which will improve fish culture and surface water irrigation. They is also a demanded to re-excavate the migratory routes of fish from surrounding rivers to the flood plain to facilitate fish movement during the monsoon. The villagers suggested to prepare more ponds for pond fish culture which will also be useful for domestic consumption other than drinking. They sought help to control the fish disease which is a serious problem in the area.

15.5 ENVIRONMENT

Significant Natural Vegetation

The natural vegetation is well developed in the area. Homesteads have a patchy but dense tree cover, from a distance looking like a forest but there is no natural forest in the area. Homestead forest comprise herbs, shrubs and trees. Most common varieties of tree are available in the area, such as *Mehogony, Segun, Mango, Jack-fruit, Jam, Palm, Hard-fruit trees, dates, Goyeba,* etc. Banana, Bamboo bush, cane bush, shajna etc. are also reported present. The homestead forest is reported to providing excellent refuge for wild animals like Mongoose, Rats, Jackle, Toad, *Hyla,* Snakes, Moles, Jungle Cats etc.

Aquatic Vegetation

Vegetation like water hyacinth, water lily, hydrilla, and many other unknown green vegetation are present in the water bodies.

Biological

Fish

Different varieties of fish are present in the ponds, *pagars* and road side ditches. The nearby *Lohajang* river is a good source of aquatic animals.

Amphibian

The amphibian population which includes Toad, Frogs, *Hyla* etc. are present both in the homestead forest and nearby ditches, though in reduced numbers. There is a report of

catching of toads and frogs in the area sometimes ago. At present this practice is not found anymore.

Reptiles

Both poisonous and non-poisonous Snakes, *Guishap,* Lizard, Turtles are reported to be present in the area but their population is reported to be decreasing. The valuable reptile *Guishap* is being killed by some people its skin.

Birds

It is reported that once the area had a rich bird population but due to unknown reasons their number has now significantly decreased. Guest bird are reported to visit the nearby *Lohajang* river during winter.

Mammals

Terrestrial Wild Animals

The homestead forest is reported to house wild animals like Jungle cats, jackle, *bagdasha, mongoose,* bats, rats etc but their population is less than before. Most of these animals are nocturnal in habit. Rats are said to be abundant in the area and is reported to cause a lot of damage to people's property.

Domestic Land Animals

Domestic land animals like cows, goats, sheep, etc. are present but in reduced number. The cause of this reduction is acute scarcity of animal fodder in the area.

Cattle Disease

It is reported that about 50 cattle have died in the village *Kumulli* and *Tetulia* last month (January 1992) due to an attack of an unknown disease. So the cattle owners are now very much concerned about the out break of that disease.

Others

Public Sanitation

There about 30 *pucca* latrines in the area and the traditional *kacha* latrines are common in almost every houses. They are mainly used by women while adult male members and children uses open space for sanitation.

Drinking Water

The main source of drinking of water in the study area is hand pumps though some drink water from open-wells. There are about 100 tube wells in the visited area. In the dry peak period the people used tube wells water for other domestic purposes in addition to drinking.

Fuel

Fuel scarcity is a serious problem in the study area. The poor people find much difficult to cook as they cannot afford to buy fuel. They depend on the mercy of others in this respect. The main sources of fuel are dried leaves, garbages, cow-dung and jute-stick. Only a small section of well-to-do people use fire wood for cooking, but this is beyond the reach of the poor.

Homestead Vegetables

In the visited area almost every homestead has a kitchen garden which contains common varieties of vegetables,such as Cauliflower, Cabbage, Bringal, Pumpkin, Chili, Radish, Gourd, Pea-nuts, Potato, Bitter Gourd etc. The villagers, after meeting their own vegetables consumption demand sell the rest.

Afforestation

People plant trees near there homesteads during the rainy season. They collect seeds and saplings of valuable plants and trees from the Agro Service Centre (Agriculture Extension Centre, *Jalphai, Tangail Town*).

Deforestation

Deforestation goes on in the area. People in time of need sell their trees to wood traders. The wood traders supply fire-wood to the brick-fields as well as to the furniture shops.

Human Activities

Agriculture

The majority of the people are engaged in agricultural. Agricultural productions is reported not to be satisfactory in the area due to natural factors like excessive rainfall and flood water.

Human Habitation

New homesteads are reported to be build in the area. About 2/3 new houses, covering an average area of 20-25 decimal, are being constructed every year. The agricultural land as well as homestead forest are gradually decreasing as a result of building of new human habitation.

Use of Insecticides and Pesticides

Crop damage by pests like *Majda poka*, (stem borer) and insect like Grasshopper are reported. Farmers, in order to avoid insect attack, are using insecticides like *Bashudin*, dimacron etc. Use of these kinds of insecticides for the Boro crop is very common.

Pollution

Open sanitation, leaving of dead animal bodies (like dog, cat, cow, chicken etc.) here and there and brick-fields, are the main sources of both water and air pollution.

Own Observation

Road side ditches, and derelict ponds were found completely dry. Homesteads traditional latrines and open sanitation exist in the area. Only a few *pucca* latrines were found. Stagnant water are a source of mosquito growth. Bamboo bush is well developed in the area and is very useful. Some brick fields were found under operation, ejecting fumes which is a health hazard. Deforestation goes on in the area and due to which ecological balance is being hampered.

Conclusion

The main environmental problems in the sub-compartment are the acute scarcity of fuel, water scarcity during the dry season, lack of sanitation facilities, deforestation, rat menace and pollution.

People as used to solve their water scarcity problem. People requested supply of tube wells in the area as the existing tube wells are not sufficient to ensure drinking water to all. They also urged to supply them the necessary inputs for construction of *pucca* latrines as the traditional *kacha* latrine is unhygienic. They requested to supply seeds of various common vegetables and saplings of *Mehogony, Segun, Kathal, Mango* etc.

15.6 SOCIO-ECONOMIC SITUATION

Major Non-Farm Activities

The major non-farm activities of the households in the surveyed area (*Gosaibari, Kumulli, Tetulia, Birkushia, Akenderpara, Paikpara* and *Nalsunda* village) are weaving, petty and seasonal business, service, agricultural and non agricultural work and other misc. activities. The majority of the non-farm households in the surveyed villages (except *Gosaibari Kumulli*) are engaged in weaving (about 65-70% - both self employed and hired) followed by daily labourer (15-20%), petty and seasonal business (10-12%), transportation (5-6%), service (3-4%) and misc. (2-3%) activities. Non-farm households of *Gosaibari Kumulli* mainly are petty and seasonal businessmen (about 40%), daily labourer (30%), service holder (10%), transport worker (5%), weaver (5%) and others (10%).

Social and Institutional Aspects

Employment Patterns

Except during sowing and harvesting of HYV Boro, family labourers are used by the farm households of the area. Hiring of labourers in the farmers during other seasons is also seen in the area but by those households who are engaged in other occupations like business,

service etc. beside farming. The day labourers from the area, mainly from the land less households, and engage themselves in the farm activities during the peak season and the majority of them find employment in the weaving industries (as daily worker) during the lean season of agriculture. The majority of the day labourers, from marginal and small farmers households, engage in petty and seasonal businesses when there is no demand for agri. labour. Some members from these households also work in weaving during the dull period of agriculture. Weaving is the price occupation of the people of the area.

Out-migration of labourers from the area (except from *Nalsunda* village) is not found, but in-migration of labourers from distant places (particularly during sowing and harvesting time of HYV Boro) is concern.

Female labourers in the area do not engage in agricultural works at fields but are involved in post harvesting engage activities at during the peak season. Female labourers are also employed (both hired and as family labour) in the weaving industries. A few (10/12) RMP female workers operate in the area.

Wage Rates

The wage rate for the agricultural works differs from one village to another in the surveyed area. In *Akendapara* and *Paikpara* the wage rate in lean season ranges from Tk.20-25 with one meal and in the peak season Tk.25-30 with two meal any for the local labourers and Tk.20-25 with three meal for outside labourers. In *Nalsunda* village agricultural labourers are given Tk.15 with two meal in the lean seasons and Tk.25 with two meal during the peak season.

The wage rate in *Gosaibari Kumulli* and *Tetulia* villages ranges from Tk.10-15 with two meal during the lean season and Tk.30-35 during the peak season with two meal. In *Birkushia (uttarpara)* village the wage rate is Tk.15-20 with two meal in the lean season and Tk.35-40 with two meals during the peak season. The daily wage of the weaving industry workers in the area ranges from Tk.35-80 depending on personal skill and quality of the saris they produce. If anybody is engaged with meals (usually 3 times) than Tk.15-18 is deducted from his daily wage. During the peak season for the industry (2-3 months before the Eid-ul-Fitre) the wage rate for the workers goes up 10-15 Taka. The female workers who are engaged in the weaving industry can earn Tk.20-25 per day without a meal for a whole day work.

The daily wage labourers in the area prefer to work in the weaving industry rather than in agriculture, for they find the farmer more profitable, less laborious, more homely and easily available.

Education and Literacy

The area has sufficient primary schools, High Schools for both boys and girls and 2/3 madrashas. A famous college is also situated adjacent to the area *(Karatia)*. All the educational institutions are at a minimum distance and are well communicable.

The highest literacy rate prevails in *Nalsundha*, 35-40% (approx.), and lowest is in *Akandapara* and *Paikpara* 15-18% (approx.). The literacy rate in *Birkushia* and *Gosaibari Kumulli* is 25-30% (approx.) while in *Tetulia* village the rate is around 20-25%. The *Nalsunda, Gosaibari* and *Birkushia* village people are more inclined to wards education while the people of *Akandapara, Paikpara* and *Tetulia* are not that conscious about the education. But the recent enrolment rate of students in schools in the area is quite high which was possible through the impact of the literacy program (for the children as well as for the adults) as run by one local NGO (SSS) in the area. The enrolment rate of student in schools in the surveyed area is about 65-70%. And the ratio of schooling for the boys and girls is 55/60: 45/40 (approx.).

Organized Groups

The area has organized groups of the Grameen Bank, BURO, SSS and the Krishi Bank. The Grameen Bank has at least one male and one female groups (with 25-30 members in each group) in each of the surveyed villages. The SSS also have their activities and groups in the area particularly in *Akandapara, Paikpara, Birkushia* and *Tetulia* village. BURO and *Krishi Bank* have their activities and groups in one or two villages with very minimum organizational support and supervision. The Grameen Bank and SSS have their fixed centres (mainly for group meeting, savings collection etc.) in the area but no such centre of BURO and Krishi Bank has been found in the area.

Public Facilities

Public facilities like UP office, Post office, Health centres/clinics, FP clinics etc. are all situated at a minimum distance from the villages and people of the area can easily avail those facilities.

Transport and Communication

The villages of the area have a good road communication system and rickshaws and vans can use the roads almost throughout the year. But at present the roads, particularly in *Gosaibari Kumulli* and *Birkushia* village, have breaches at some points, which causes inconveniences to the people of the area to move during the rainy season.

Markets

To sell their agricultural and industrial products and to buy their daily necessities, raw materials and other inputs, people of the area go to the markets/bazaars as listed below (with other information):

Sl.#	Markets/Bazaars	Hat day	Attendance	Remarks
1.	*Karatia*	Thursday		Karatia hat
2.	*Putiajani*	Friday	06-8000	has a bazaar
3.	*Bajitpur*	Thursday	04-5000	every day
		Friday &	1.5-2000	- do -
		Monday	02-3000	- do -
4.	*Pathrail* (Bazaar)	Daily	2.5-3000	- do -
5.	*Tangail* (Bazaar)	Daily	?	- do -

General Needs

In respect of education and marketing the people of the area do not face any real problem. Health clinics and centres are also around, but with minimum medical facilities and therefore practically the poorer families get no benefits from the health centres/clinics. Drinking water facilities are not quite sufficient in the area. More HTW are needed in some of the villages viz. *Gosaibari Kumulli*, *Akandarpara* and *Paikpara*.

Own Observation

Existing Water Related Situation

The area in the western and southern part (including *Nalsunda* village) of the sub-compartment is comparatively of higher elevation and therefore, flooding is not a problem to the people of the area. Drainage congestion is also not so widespread. The northern part (*Gosaibari* village) and particularly the central part (*Akandarpara, Paikpara and Bisnopur* village) suffer drainage congestion which causes damage to HYV Boro paddy (just prior to harvesting) and also hampers Aman cultivation. Due to drainage congestion, rabi crops also fail in the area. Both rain water and riverine water cause inundation of the *chaks* and thereby drainage congestion problem in the area.

Socio-Economic Situation

In respect of education and economic conditions people of *Nalsunda, Birkushia* and *Gosaibari Kumulli* are in a better position than the people in *Akandarpara, Paikpara* and *Tetulia*. The weaving industries is playing an important role for the better economic condition of the people of these villages as the industry provides a good employment opportunity (almost the year round), including females.

Peoples Opinion (about solving water related problem).

The majority of the people of the area expressed the need to re-excavate a couple of *khals* of which *Birkushia khal* and *Kumulli khal* are prominent, to remove the drainage congestion problem of the area. In regards *Kumulli khal* excavation, some people of *Gosaibari Kumulli* opposes this idea as they think excavation of *Kumulli khal* will have negative effects on their deep water Aman cultivation by reducing optimum water level in the field.

On the other hand, regarding excavation of *Birkushia khal,* people of *Birkushia* particularly of down stream of the *khal* opined that the *khal* should follow a short-cut alignment (from *Birkushia chak* up to *Lohajang)* for quicker drainage. In their view the present *khal,* re-excavated will not serve the purpose.

Conclusion

The main problem of the area is water logging and drainage congestion. If this problem is solved then the people of the area will be benefitted to a great extent both economically and socially. The people who support the excavation of the *khals,* have been found agreeable to participate economically and socially if the *khal* excavation program is really undertaken.

However, people's view both of upstream and down stream about a suitable alignment (if a new alignment is chosen) for excavating a *khal* should always be considered before hand.